Tivoli® IBM Tivoli Storage Manager for System Backup and Recovery (SysBack)

Version 6.1

IBM

Installation and User's Guide

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Contents

IBM Tivoli Storage Manager for System Backup and Recovery (SysBack) Overview

IBM Tivoli Storage Manager for System Backup and Recovery (also known as SysBack™) provides system administrators and other system users with a simple, efficient way to back up and recover data from a command line or a SMIT menu-driven interface. SysBack lets you recover all or part of the system. SysBack is also flexible; you can install one system installation image to another system with either identical or different hardware configurations, called "cloning";

Below is a partial list of SysBack features:
- Create various types of backups, including:
    - Full system (installation image)
    - Volume groups
    - Logical volumes (raw data)
    - File systems
    - Specific directories or files
    - Offline Mirror Backups
    - Snapshot Backups
    - Backups to a TSM server
- Incrementally backup and restore data.
- Perform "power" system backups that enable faster backup and restore times by backing up all data as raw logical volumes and heighten read-write performance while reducing CPU usage.
- Perform backups to locally attached tape drives or files on disk and remote hosts across the network.
- Selectively exclude specific files, directories, file systems, or logical volumes from backups.
- Centrally manage backup clients using "pull" backups from a single server.
- Create backup scripts for easy automation.
- Define backup schedules for easy automation.
- Execute pre-backup and post-backup scripts that enable environment-specific task automation, including halting database applications before beginning a backup.
- Perform backups to multiple sequential devices, automatically continuing the backup on the next device when the first is full and minimizing manual intervention when autoloading libraries are not available.
- Perform backups to multiple parallel devices, called "striping," which lets you complete a single backup in a fraction of the normal time.
- Create multiple copies of a single backup to different devices in approximately the same time it takes for a single copy.
- View progress status indicators that display estimated backup or restore sizes, times, performance estimates and a completion percentage estimate.
- Receive completion status logs on all backup, list and verification operations.
- Use SMIT menus to configure SysBack options, which let you backup and restore volume groups, logical volumes, file systems, directories, or files and list and verifying backup images.

- Use sequential autoloading devices to minimize manual intervention and tape loading operations.
- "Stack" multiple backups on a single tape for all backup types.
- Reinstall the system to its original device configuration, including the volume group and logical volume placement on disk and attached devices, using Full System (Installation) Image to the same or different system (also called "cloning").
- Install the system from local boot/installation media or from a Tivoli Storage Manager server.
- Perform a network boot or installation using SysBack functions or using existing Network Installation Manager (NIM) resources.
- Perform Recovery Installation that restores only the base operating system (root and /usr file systems) without affecting other data in the rootvg or other volume groups.
- Preserve multi-copied (mirrored) or striped logical volumes on recreate.
- Import, ignore, or recreate and restore each volume group or logical volume from a single backup media during installation.
- Retain exact partition placement of logical volumes or make contiguous partitions of any that have become fragmented; this will improve I/O performance on recreate.
- Execute post-installation scripts to perform environment specific tasks.
- Use post-installation to remove SysBack or network configuration after cloning a backup image to a different machine or to indicate the location of installation media for automatically installing device support to the new machine.
- Set network and tape boot defaults to minimize, and often eliminate, the need for user prompting during an installation.
- Edit or change the physical location and attributes of volume groups, logical volumes, and file systems during recreation.
- Restore data at the volume group, logical volume, file system, directory or file level.
- Interactively select files to restore by letting you specify a file list, use a search word or use a wildcard to narrow the list.
- Exclude select file systems or logical volumes during restore operations.

About This Publication

This book contains information about configuring and using IBM Tivoli Storage Manager for System Backup and Recovery, also known as "SysBack". The book contains instructions on using the System Management Interface Tool (SMIT) menus for performing backups as well as a commands reference to perform SysBack functions without the SMIT menus.

IBM Tivoli Storage Manager for System Backup and Recovery Documentation

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli Information Center Web site. You can access updated publications in the Tivoli Information Center from the following Customer Support for Tivoli products Web site:

http://publib.boulder.ibm.com/tividd/td/tdprodlist.html

Related publications

The *Tivoli Software Glossary* includes definitions for many of the technical terms related to Tivoli software. The*Tivoli Software Glossary* is available at the following Tivoli software library Web site:

http://publib.boulder.ibm.com/tividd/glossary/tivoliglossarymst.htm

Accessing publications online

You can access and download IIBM Tivoli Storage Manager publications from the following locations:

IBM Tivoli Storage Manager Information Center

You can find PDF and HTML versions in the Information Center at:

http://publib.boulder.ibm.com/infocenter/tivihelp/v1r1/index.jsp

IBM Publications Center

You can find PDF versions in the IBM Publications Center at www.ibm.com/shop/publications/order

Tivoli technical training

For Tivoli technical training information, refer to the following IBM Tivoli Education Web site:

http://www.ibm.com/software/tivoli/education

Support information

If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

- Searching knowledge bases: You can search across a large collection of known problems and workarounds, Tech notes, and other information.
- Obtaining fixes: You can locate the latest fixes that are already available for your product.
- Contacting IBM Software Support: If you still cannot solve your problem, and you need to work with someone from IBM, you can use a variety of ways to contact IBM Software Support.

For more information about these three ways of resolving problems, see "Contacting IBM Software Support" on page 498.

Conventions Used in This Book

This guide uses the following typeface conventions:

Bold

- Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multi-column lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip:**, and **Operating system considerations**:)
- Keywords and parameters in text

Italic

- Words defined in text
- Emphasis of words (words as words)
- New terms in text (except in a definition list)
- Variables and values you must provide

`Monospace`

- Examples and code examples
- File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
- Message text and prompts addressed to the user
- Text that the user must type
- Values for arguments or command options

Chapter 1. Installation

To install IBM® Tivoli® Storage Manager for System Backup and Recovery, also known as, SysBack, you must have the prerequisite software installed on your system.

System Requirements

The following sections describe the hardware and software requirements required to use SysBack.

System Hardware Requirements

SysBack supports the following hardware:

- IBM @server pSeries™ systems
- IBM @server iSeries™ systems running AIX®

System Software Requirements

The following software is required to use SysBack:

- AIX V5.2, or V5.3
- The **bos.sysmgt.sysbr** fileset.
- When AIX is installed, the following filesets are installed automatically with the system and may not be removed in order for SysBack to function properly:
  - **bos.rte.net**
  - **bos.rte.archive**
  - **bos.rte.libnetsvc** (when using Network Install functions)
- If you will be using the Remote Services functions of SysBack, the following AIX filesets are required:
  - **bos.rte.net**
  - **bos.net.tcp.client**
- If you will be using the Classic Network Boot functions for the Network Installs, the AIX **bos.net.nfs.client** fileset is required.
- If you will be using the NIM Resource Network Boot functions for Network Installs, the NIM environment and resources must first be installed and configured in the desired locations for SysBack to utilize these resources.

Tape Drive Support

SysBack does not provide support for any particular tape drive. Instead, SysBack uses standard IOCTL commands to communicate with the drives. SysBack will execute read or write operations until the physical end of tape is reached. At that point, SysBack issues an eject command and waits for the next tape to be loaded. A tape may be loaded via human intervention, by the autoloading mechanism of the device, or via a library device mechanism.

Therefore, SysBack can utilize any tape drive device that is natively supported by the AIX operating system. SysBack can also support any tape drive device that is recognized by AIX when using device drivers supplied with the tape drive device.

E.g. As long as AIX recognizes the tape device and configures it to have a /dev/rmtX name; SysBack can read and write to that device.

Tape drives that are a part of a library device require extra consideration. If the library is a type commonly referred to as a "sequential auto loader", the autoloading mechanism of the library device will load the next tape for SysBack to use once SysBack has issued an eject command to the tape drive. If the library device is not an autoloader, it will have a separate robotic mechanism to manipulate tape movement. In those situations, a device name must be configured in AIX to represent that library device. However, SysBack does not provide any special support for the library device mechanism. Also, SysBack will not directly communicate with the library device name. Therefore, after SysBack has issued an eject command to the tape drive, the customer must issue any commands required to manipulate the library device for tape movement. These commands may be issued manually or via a script. Scripts to manipulate library device movements can be integrated into SysBack operations via special **End of Tape Processing** utilities provided by the product.

Because of this design, SysBack can work with any tape device on the market, by any vendor, so long as:

- AIX can configure a device name for it
- It functions as a sequential autoloading device or,
- The device driver provides an external command line interface for issuing commands to control tape movement

An additional note about tape drive support:

Using certain newer devices like the IBM 3592, which provide encryption functions, can cause problems if the application using them does not formally support that feature of the drive.

SysBack will support these types of drives as previously described. However, SysBack does not support the mechanisms and features that provide encryption. SysBack's support statement related to tape drive encryption is:

SysBack does not presently support any form of drive enabled encryption, nor does it provide integration with any software or hardware encryption methods. This does not preclude the use of transparent encryption. For example: using the TS1120 (IBM 3592) with "System" or "Library managed" encryption enabled. However, those tapes created with transparent encryption methods:

- Can not be used for system boot due to system firmware limitations
- Can not be used for system recovery (even with alternate boot media)
- Can not be accessed during outages to the encryption system

Therefore, the use of transparent encryption methods in conjunction with SysBack should be done so with extreme caution to ensure that the data on the tapes can be recovered during a system outage.

Additional Requirements for Using the CD/DVD Backup Feature

If you will be using the CD/DVD backup feature, you may choose to write to the device:

- using the AIX UDF filesystem type
- using ISO 9660 format type

When using the ISO9660 format type, the GNU software tools named `mkisofs` and `readcd` are required. When using AIX 5.3, the `mkisofs` and `readcd` tools are installed as a part of the operating system. When using AIX 5.2, you can acquire these tools via the `cdrecord` package available from the **AIX Toolbox for Linux**. You can access the AIX Toolbox for Linux components from: http://www-1.ibm.com/servers/aix/products/aixos/linux/download.html. Once these GNU Tools have been installed, you must create the following symbolic links:

- `ln -s /usr/samples/oem_crwriters/burn_cd_gnu /usr/sbin/burn_cd`
- `ln -s /usr/samples/oem_crwriters/mkrr_fs_gnu /usr/sbin/mkrr_fs`

SysBack can utilize any CD or DVD device that is natively supported by the AIX operating system. SysBack does not support any CD or DVD device that requires its own proprietary devices drivers or software in order to operate. For a list of the devices explicitly supported and tested by AIX at your operating system level, please see the file: `/usr/lpp/bos.sysmgt/README.oem_writers` provided by the operating system.

Additional Requirements for Using TSM Integration Features

If you will be using the TSM Integration features, you will need:

- A previously configured Tivoli Storage Manager server at version 5.4 or later
- The 32-bit TSM API Client at version 5.4 or later

Note: The Tivoli Storage Manager node name used for backups initiated by SysBack must be registered on the SysBack server and configured to use the `passwordacess generate` option.

Upgrading from Earlier Versions of SysBack

If you are upgrading from any SysBack Version 5 level, you will not need to uninstall it before installing the SysBack version 6 product.

The installation process for SysBack will preserve any previous configurations.

Procedure for Installation from CD-ROM

After the prerequisite software is installed:

1. Log in as a root user. You will see the following:

   ```
   IBM AIX Operating System
   (c) Copyright IBM Corp. 19XX, 19XX
   (/dev/console)
   login: root
   ```

2. Insert the *IBM Tivoli Storage Manager for System Backup and Recovery* installation CD into the CD-ROM drive.
3. Type the AIX command `smitty install`.

   Note: This command invokes the System Management Interface Tool (SMIT), which presents a menu-driven environment for the installation process. The argument `install` is a fastpath that takes you directly to the software installation process. The menu selections differ from one version and release of the operating system to another, so menu selections displayed on your system may differ slightly.

4. From the Software Installation and Maintenance menu, select **Install and Update Software**.

5. Select **Install and Update from the LATEST Available Software**.
6. At the INPUT device/directory for software prompt, type the device name of the CD-ROM drive. For example, /dev/cd0.
7. The following screen is displayed:

```
            Install and Update from LATEST Available Software

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
 INPUT device/directory for software               /dev/cd0
 SOFTWARE to install                               [_all_latest]
  PREVIEW only? (install operation will NOT occur)   no
  COMMIT software updates?                           yes
  SAVE replaced files?                               no
  AUTOMATICALLY install requisite software?          yes
  EXTEND file systems if space needed?               yes
  OVERWRITE same or newer versions?                  no
  VERIFY install and check file sizes?               no
  Include corresponding LANGUAGE filesets?           yes
  DETAILED output?                                   no
  Process multiple volumes?                          yes




 F1=Help           F2=Refresh        F3=Cancel         F4=List
 F5=Reset          F6=Command        F7=Edit           F8=Image
 F9=Shell          F10=Exit          Enter=Do
```

Figure 1. The Install and Update from Latest Available Software Menu

8. To install the SysBack product, accept the default settings.

   To install individual filesets, highlight **Software to install** and press F4. Individually, select the filesets to install.
9. Press Enter to confirm selections and install the software.
10. You will be prompted to "accept" the electronic license agreement. Indicating a "No" response will prohibit the installation of these filesets.

Chapter 2. SMIT Overview

This chapter provides information about the SMIT menu interface. SMIT is used for virtually all AIX system administrative tasks.

Accessing SysBack

To access the SysBack menus, type smit on the AIX command line to access the System Management Interface Tool. After SysBack is installed, IBM Tivoli Storage Manager for System Backup and Recovery is displayed at the bottom of the main menu. Select this option to access additional SysBack screens. You can alternatively type smitty sysback to jump directly to the SysBack screens. The following is an example of the SysBack Main SMIT Menu as shown using the ASCII SMIT menu.

```
       IBM Tivoli Storage Manager for System Backup and Recovery

Move cursor to desired item and press Enter.

  Backup & Recovery Options
  Debug Options
  Offline Mirror Backup Options
  Snapshot Backup Options
  Offline Mirror Backup Options
  Configuratoin Options
  Tape Drives
  Utilities
  Backup Schedules and Scripts
  Device to Device Copy
  TSM Configuration



F1=Help              F2=Refresh          F3=Cancel           F8=Image
F9=Shell             F10=Exit            Enter=Do
```

Figure 2. ASCII version of the SysBack Main SMIT Menu

Note: To use most of the options within the SysBack menus, log in to the system as a root user. This is for several reasons:

1. Only a root user has authority to read, and therefore backup or restore, many files in the system.

2. When restoring files under a non-root user, that user, if permitted to read the files, becomes the new owner of the files. Files are returned to their original ownership only when restored by a root user.

3. Many options, such as changing the block size of the tape drive, creating network boot images, or configuring network server and client options, require that you have root privileges to perform the task.

How the SysBack Menus are Organized

The menus are organized by the type of function that you can perform, followed by additional options used for configuring or customizing additional SysBack options. The SysBack Main Menu includes the following options:

Backup & Recovery Options

Use this menu to display additional options for standard back up, list, verify, or restore operations. The following menu is displayed when the top level **Backup & Recovery Options** menu is selected.

```
                    Backup & Recovery Options

Move cursor to desired item and press Enter.

  Backup Options
  List Backup Contents
  Verify a Backup
  Recreate Volume Groups, Logical Volumes & Filesystems
  Restore Data from a Backup




F1=Help            F2=Refresh         F3=Cancel          F8=Image
F9=Shell           F10=Exit           Enter=Do
```
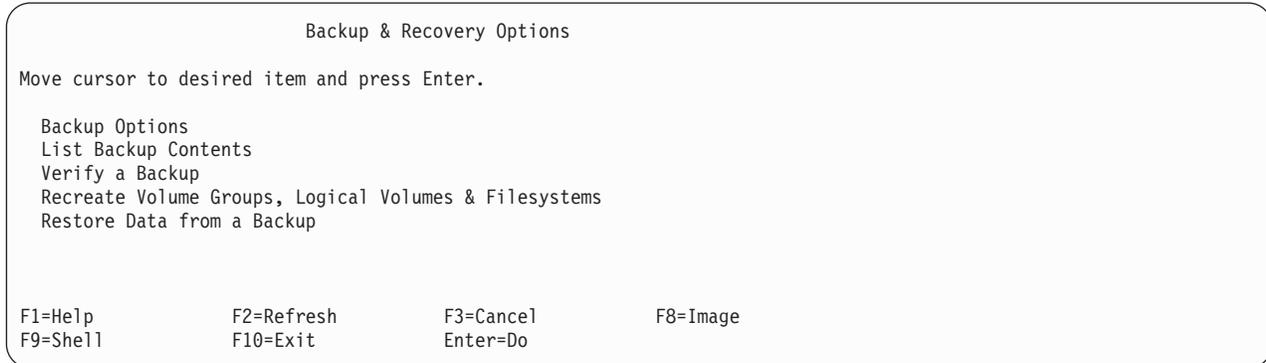
Figure 3. The Backup & Recovery Options Menu

Debug Options

Use this menu to display additional options to capture system installation related debug information into an NFS mounted directory. Additionally, the Collect SysBack Environment and System Information option enables the collection of normal mode related debug information. The following menu is displayed when the top level **Debug Options** menu is selected:

```
                    Debug Options

Move cursor to desired item and press Enter.

  Add, Change or Show Debug Boot Defaults
  NFS Configuration Options for Debugging
  Collect SysBack Environment and System Information




F1=Help            F2=Refresh         F3=Cancel          F8=Image
F9=Shell           F10=Exit           Enter=Do
```
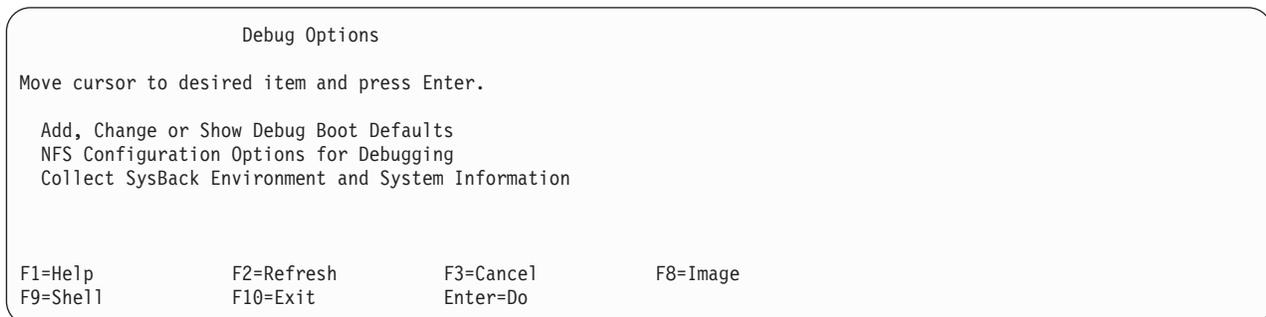
Figure 4. The Debug Options Menu

Offline Mirror Backup Options

Use this menu to display additional options for tasks associated with the Offline Mirror Backup of JFS filesystems. The following menu is displayed when the top level **Offline Mirror Backup Options** menu is selected:

```
          Offline Mirror Backups

Move cursor to desired item and press Enter.

  Maintain Backup Command Files
  Perform an Offline Mirror Backup
  Maintenance Utilities




F1=Help              F2=Refresh           F3=Cancel           F8=Image
F9=Shell             F10=Exit             Enter=Do
```
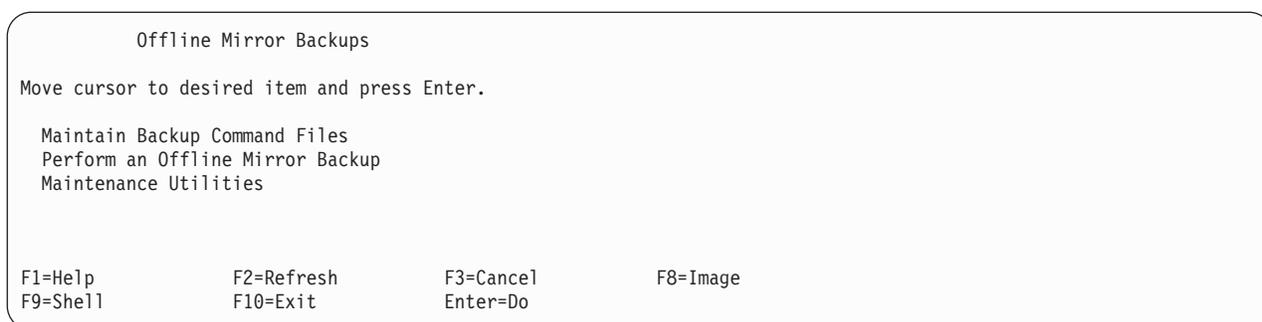
Figure 5. The Offline Mirror Backups Menu

Snapshot Backup Options

Use this menu to display additional options for tasks associated with the Snapshot Backup of JFS2 filesystems. The following menu is displayed when the top level **Snapshot Backup Options** menu is selected:

```
          Snapshot Backup Options

Move cursor to desired item and press Enter.

  Maintain Backup Command Files
  Perform an Offline Mirror Backup
  Maintenance Utilities




F1=Help              F2=Refresh           F3=Cancel           F8=Image
F9=Shell             F10=Exit             Enter=Do
```
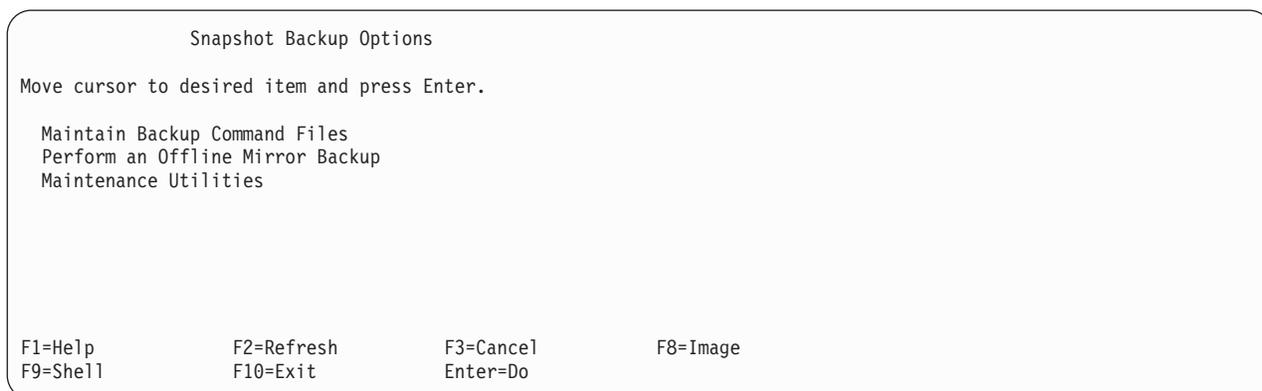
Figure 6. The Snapshot Backups Options Menu

Configuration Options

Use this menu to display additional options for configuration tasks, such as providing access to local and remote users, adding and deleting entries from exclude lists, and creating or deleting virtual device descriptions. The following menu is displayed when the top level **Configuration Options** menu is selected:

```
          Configuration Options

Move cursor to desired item and press Enter.

  Local User Access
  Remote Services
  Remote Command Access
  Virtual Devices
  Exclude Lists
  Network Boot/Install Configuration


F1=Help              F2=Refresh           F3=Cancel           F8=Image
F9=Shell             F10=Exit             Enter=Do
```
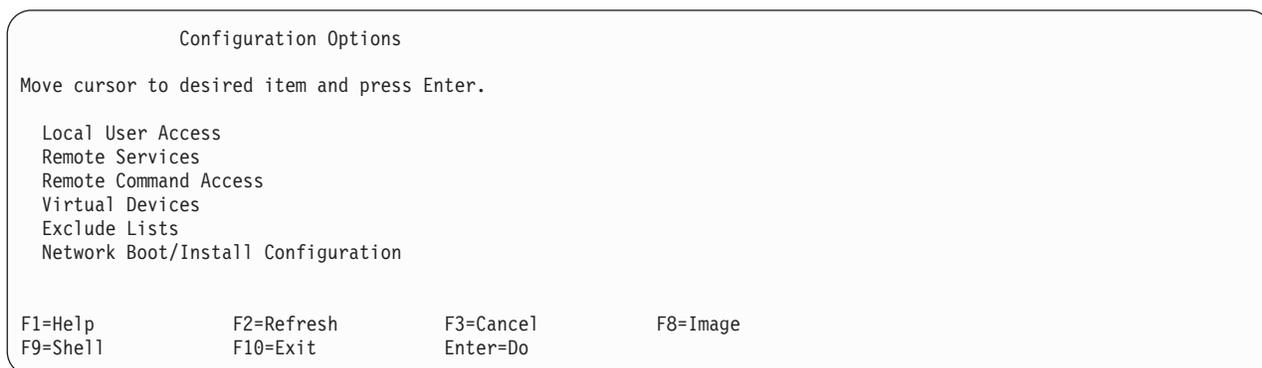
Figure 7. The Configuration Options Menu

Tape Drives

Use this menu to display options to manipulate tape drive attributes in AIX.

```
                Tape Drives

Move cursor to desired item and press Enter.

  List All Defined Tape Drives
  Configure a Defined Tape Drive
  Unconfigure an Available Tape Drive
  Change Tape Drive Characteristics
  Unload/Eject Tape from Drive




F1=Help           F2=Refresh        F3=Cancel        F8=Image
F9=Shell          F10=Exit          Enter=Do
```
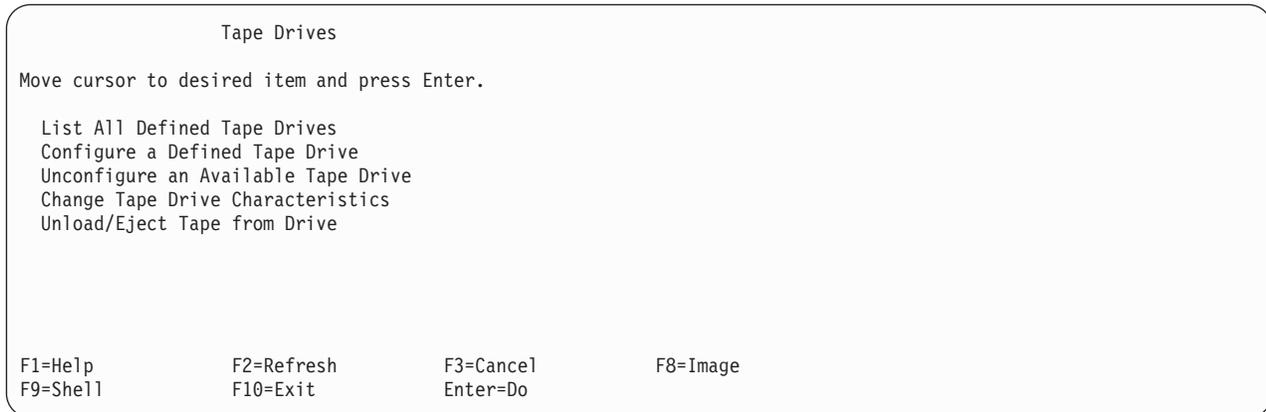
Figure 8. The Tape Drives Menu

Utilities

Use this menu to access a variety of options related to the creation of boot-only media, boot option configuration, and activity logging operations.

```
                Utilities

Move cursor to desired item and press Enter.

  Display SysBack Product Install History
  Print or Display System Configuration
  Create a Bootable Tape (without data)
  Create a Bootable CD/DVD (without data)
  Change Tape Boot Defaults
  Create CD/DVD Boot Defaults
  Change Read Permission on a Disk Image File
  Create or Edit an LVM Information File
  Create a Custom Installation Diskette
  Change Program Defaults
  Logging Options



F1=Help           F2=Refresh        F3=Cancel        F8=Image
F9=Shell          F10=Exit          Enter=Do
```

Figure 9. The Utilities Menu

Backup Schedules and Scripts

Use this menu to display additional options associated with the creation of backups scripts and schedules. The following menu is displayed when the top level **Backup Schedules & Scripts** menu is selected

```
            Backup Schedules and Scripts

Move cursor to desired item and press Enter.

  Backup Schedules
  Backup Scripts




F1=Help            F2=Refresh         F3=Cancel          F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 10. The Backup Schedules and Scripts Menu

Device to Device Copy

The following menu is displayed when the top level **Device to Device Copy** menu is selected:

```
            Device to Device Copy Options

Move cursor to desired item and press Enter.

  Copy Backup Disk Image or CD/DVD to Tape
  Copy Backup Tape to Backup Disk Image
  Copy Backup Tape to Backup Tape


F1=Help            F2=Refresh         F3=Cancel          F8=Image
F9=Shell           F10=Exit           Enter=Do
```
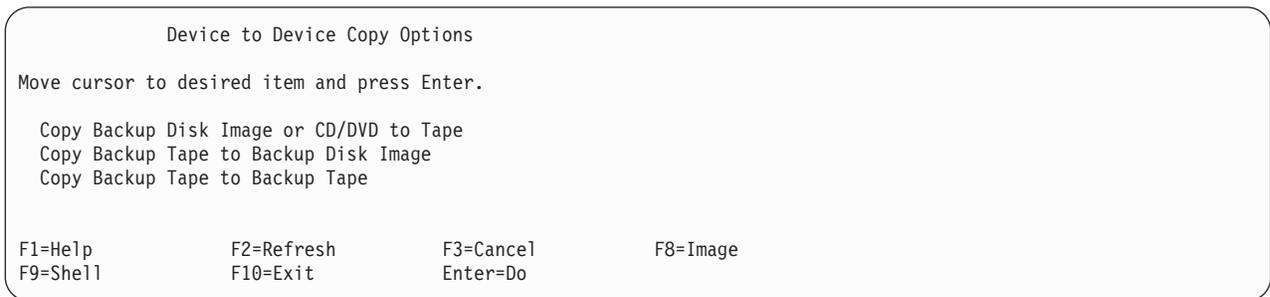
Figure 11. The Device to Device Copy Menu

TSM Configuration

Use this menu to display additional options related to tasks associated with SysBack's TSM integration features. The following menu is displayed when the top level **TSM Configuration** menu is selected:

```
            TSM Configuration Options

Move cursor to desired item and press Enter.

  TSM Virtual Device Configuration
  TSM Backup Management
  Set TSM Network Install Client Defaults


F1=Help            F2=Refresh         F3=Cancel          F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 12. The TSM Configuration Options Menu

Device Selector Screens

When selecting a backup, list, verify, recreate or restore option from any SMIT menu, you are prompted for the device, directory, or filename to use.

Various tape devices, virtual devices, or filename options are displayed, depending on the backup permission granted the specific user or host. The backup options available when the backup is performed to a local device or directory are determined by the local access definitions created using the Add or Change Device/Directory access to Local Users option. When you back up to a remote backup server, the backup options are determined by the settings configured by the **Add or Change Client Host Access to this Server** option executed on the server. If no directories are defined for disk image file backups, then no disk file options are provided.

Figure 13 shows the backup options that might be included on the device selector screen:

```
          Select Backup Device or Network Install Image Directory

Move cursor to desired item and press Enter.

Virdev      vdev0    SysBack Sequential Virtual Device
Tape        3570     Tape Drive
TSMDEV      tsm0     sysback1_node1
Dir         /usr/lpp/sysback/images/local
hambone.austin.ibm.com /dev/rmt0 5.0 GB 8mm Tape Drive



F1=Help                 F2=Refresh              F3=Cancel
F8=Image                F10=Exit                Enter=Do
F1 /=Find               n=Find Next             F9 Shell
```

Figure 13. Backup Options

The first column contains the device type and can be any of the following:

VirDev   Virtual devices that you have configured. The device name (vdev0) is automatically assigned by the system. The description shown is either one that you assign or a default description assigned by the system. The physical devices that make up the virtual device are listed at the end of the line in parentheses.

Tape   Tape drives available on the local system. Local tape drives are always displayed first in the list.

Dskt   Diskette drives on the local system. A diskette option is not displayed for a system backup.

Dir   For backup options, the name of the directory available to the user based on their access permissions. The directory shown is the directory that was enabled for the user via Remote or Local User Access configuration. For list, verify, and restore options, all files in the user's backup directories are displayed.

File   For list, verify, recreate and restore options, the name of a local disk image file. Only files in the directories the user has access to are displayed. Files of all backup types are shown.

TSMDEV   A TSM Virtual Device that you have configured. TSM Virtual Devices enable SysBack backup, list, verify, recreate, and restore options to access a defined TSM server.

Hostname: The hostname is the name of a server for which this host has remote access. The information can be any one of the following:

                Tape Drive Name
                        Tape drives on the remote machine. Only remote

tape drives on hosts that have granted access to this host, as well as those that have been defined by the local host, are included on this selector screen.

Virtual Device Name

Virtual devices configured on the server. The virtual device description from the remote machine and the physical tape drive name(s) are shown. Only virtual devices for hosts that have granted access to this host, as well as those that have been defined by the local host, are included on this selector screen.

File or Directory

For list, verify, recreate and restore options, a filename is shown for each disk image backup file that exists on the server in the directories for which this host has access. For backup options, a directory name is shown for all directories this host has permission to write to.

You must select one of the options provided on the selector screen before proceeding. After you select an option, you can change the device, filename or unique ID selected on the dialog screen that follows, but the backup cannot execute unless you have permission to access the specified device or directory.

Backups to Disk Image Files

To perform a disk file backup, select a directory name from the device selector screen. A filename is automatically generated as follows:

/Directory/Type.Hostname.UniqueID

The filename contains the following parts:

Directory   The directory selected.

Type   The type of backup being performed. One of the following is used:

    SB   System Backup

    VG   Volume group

    LV   Logical Volume

    FS   File system

    FD   File/Directory

Period (.)   A delimiter.

Hostname   The name of the host performing the backup. This is set to "localhost" if no hostname is defined.

Period (.)   A delimiter.

UniqueID   A unique ID that, by default, contains the date and time of the backup in "MMDDhhmm" format. For example, if a backup is made on Feb. 28 at 3:20 P.M., the unique ID would be "02281520". You can later change this ID to any other value that might more accurately describe the backup contents.

Although the filename in SMIT is displayed only as shown above, most backups actually create more than one file, each named as above, but with an additional extension. The first file has a ".TOC" extension, indicating the file is the table of contents of the backup. For a File/Directory backup, the ".TOC" file also contains the backup data, because there is always only one image in this backup. For all other backup types, an additional file is created for each logical volume or file system included in the backup, with the logical volume name as the file extension. This file contains the actual backup data for each logical volume or file system.

Backup, List, Verify and Restore Command Output Screen

The output screen for the backup, list, verify, and restore options is different from that of other SMIT-executed commands. This screen provides the following advantages:

- Output is not saved in the SMIT log file (**smit.log**). This prevents very long file lists from taking unnecessary space on the disk. You are still provided the option of writing the output to a log file after the command has completed.
- There is no delay when the command has completed. The delay is normally required for SMIT processing and writing of the **smit.log** file.
- Command output (stdout) and error (stderr) are displayed in separate windows. This provides much cleaner output for commands that provide both standard output and standard error messages.
- The complete command and the time the command started and ended is displayed at the top of the screen.

The following is an example of the output of a file/directory backup executed from SMIT:

```
COMMAND: mkdirback -hhambone.austin.ibm.com -f/sysback.images/fatrat/backu ...
STARTED: Feb 28 18:37:36   ENDED:                      STATUS: Running
                              Command Output
Generating file list ..


================================================================================
                      Command Error / Status

NOTE: Estimated megabytes is approximate since data is compressed.
Backing up Files "/tivoli"
  Start date is Mon Feb 28 18:36:31 2000
  User is root at lasher
  Estimated size is 678 MB


                       ESTIMATED PROGRESS
    -------------+--------------------+------------------+--------------
    % Complete |   Elapsed Time     |    Megabytes    |  Kbytes/Sec
    -------------+--------------------+------------------+--------------
         1     |   0 minutes of 42  |    7 of 678     |     272
```

Figure 14. The output of a file/directory executed from SMIT

Note that the screen is separated into two "windows." The first is for Command Output (stdout). The second is for Command Error (stderr) and Status. The Command Error section is always used to display error messages but is also often used for other output, such as file lists, status indicators, and so on.

In the above example, a file/directory backup of the **/home/data** directory was performed. The user selected the **progress indicator** report output type during the backup, rather than the list of files. The progress indicator shows the estimated

time and amount of data to be backed up, the actual percent, time, and amount complete, and the average performance in kilobytes per second.

When the command has completed, you can perform the following functions by pressing the appropriate function key:

F1 Help   Displays a help screen that provides details of the functions you can perform from this output screen.

F2 Refresh   Erases and re-displays all the information you see. This is necessary only if there are other commands, such as system console information, running that output to this terminal and overwrite the command output.

F3 Return   Returns you to the previous SMIT dialog screen.

F4 Select   Toggles between the Command Output and the Command Error/Status window, enabling each to scroll independently. The active window is indicated by the arrows (===> *window*<===). After you have selected the window to scroll, you can then move through the output using the following keys:

> **Page Down**   Scroll forward one screen
>
> **Page Up**   Scroll backward one screen
>
> **Down—Arrow/Enter**   Scroll backward one line
>
> **Up—Arrow**   Scroll back one line
>
> **Home**   Display first screen
>
> **End**   Display last screen

F5 Save   Save the entire output in a log file. You are asked to enter the name of the log file. The default file is *$HOME*/**sysback.log**, where *$HOME* is the user's home directory. Either enter a new file name or press Enter to accept the default. The following example shows a sample output file:

```
COMMAND:     mkdirback -f/dev/rmt1 -s /home/tj
START TIME: Mar 20 02:22:30
END TIME:   Mar 20 02:25:49
STATUS:     Successful


      ============== Command Output ==============
Rewinding rmt1 ...
Generating file list ..

File/Directory backup completed successfully.


      ============== Command Output ==============

Backing up Files */home/tj*
  Start date is Thu Mar 20 02:22:33 1997
  User is root at sysdev41
  Estimated size is 169 MB


                      ESTIMATED PROGRESS

    -----------------------------------------------------
    % Complete │  Elapsed Time  │  Megabytes  │ Kbytes/Sec
    -----------------------------------------------------
      100        3 minutes of 3    170 of 170       913

Backup ended Thu Mar 20 02:25:46 1997
170 megabytes written to 1 volume.
```

SMIT Help Screens

You can obtain help information from any point within SMIT. If a menu selection
is currently displayed, highlight a function and press F1 for information regarding
the use of that function. For any dialog selection, F1 provides information on the
use of that selection, the options available, and how they affect the function being
performed.

SMIT Fastpaths

From any SMIT menu or dialog screen (where you type or change options), press
F8 to display the SMIT *fastpath* for quickly reaching that selection from the
command line. Later, to skip directly to the desired selection, you can type `smit`
fastpath at the command line, where *fastpath* is the fastpath for the desired
selection.

Obtaining Command Line Options from SMIT

You can execute any SMIT command outside of SMIT by placing the command in
a shell script. You can place multiple commands in shell scripts to be executed in
sequence, enabling a sequence of multiple commands to be performed without
user interaction. You can also place the shell scripts in **cron**, an AIX job scheduling
facility.

To obtain the command line options for a SMIT command, use the following steps:

1. Select the SMIT option to perform and any additional selections required for
   this function.
2. Fill out any fields or change the field values in the dialog screen as you would
   when executing the command from SMIT.

3. Before pressing Enter to execute the command from SMIT, press F6 to show the command on the screen.

The following is an example of the SMIT output when you press F6:

```
Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                          [Entry Fields]
  Hostname of server                      hambone.austin.ibm.com
  Device name                             /dev/rmt0
  Report output type                      progress indicator


          SHOW COMMAND STRING

  │ Press Enter or Cancel to return to the
  │ application.

# Ignore "/usr/sbin/sbsmitout -sN" prefix
# when executing outside of SMIT:

/usr/sbin/sbsmitout -s7 mkdirback -h'hambone.austin.ibm.com' -f'/dev/rmt0' '-x'  '/home'

F1 F1=Help               F2=Refresh              F3=Cancel
F5 F8=Image              F10=Exit                Enter=Do
F9
```

Figure 15. Results of Using the F6 Key to Show the Command String

Single quotes (') around text are required only when there is more than one word to a single command argument. They do not need to be used to surround a single word.

Backup, list, verify and restore commands contain the comment indicating that the prefix of the command **/usr/sbin/sbsmitout -sN** should be omitted. This prefix causes the command to be executed within the two-part SysBack SMIT command output screen previously described. Do not use this output screen should when executing commands at the command line if the intention is to not require user interaction.

Chapter 3. License Configuration

To license your SysBack software, you must simply install the:

- **tivoli.tsm.client.sysback.license.rte**
- **tivoli.tsm.client.sysback.license.cert**

filesets included on your product media in addition to the installation of the base **tivoli.tsm.client.sysback.rte** fileset.

Chapter 4. Performing Backups

As soon as SysBack is installed, you can perform a backup to any local device or to the default SysBack backup image files directories.

To access the **Backup Options**:

1. At a command line, type `smit`.
2. Select **IBM Tivoli Storage Manager for System Backup and Recovery**.
3. Select **Backup & Recovery Options**.

You can also access this menu using the fastpath. To do this, type `smitty sb_backup` at a command line. The following screen is displayed:

```
                        Backup Options

Move cursor to desired item and press Enter.

  Backup the System (Installation Image)
  Backup the System to CD/DVD
  Backup Volume Groups
  Backup Filesystems
  Backup Logical Volumes
  Backup Files or Directories
  LVM Only Backup




 F1=Help              F2=Refresh           F3=Cancel            F8=Image
 F9=Shell             F10=Exit             Enter=Do
```
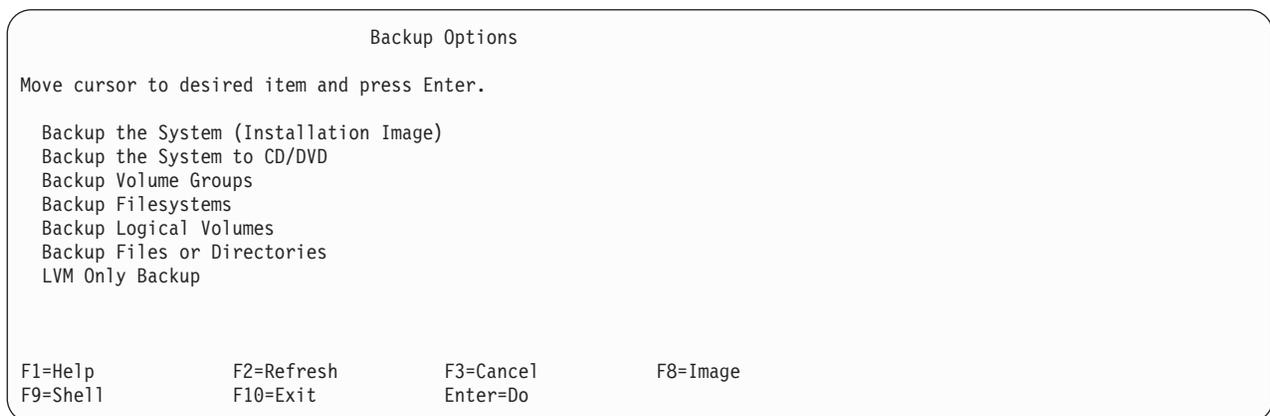
Figure 16. The Backup Options Menu

You can select any of the backup options, each of which are described in detail in this chapter. The first option, **Backup the System (Installation Image)**, is used to create a backup of the operating system and any additionally selected volume groups. This is the only backup from which the system can be reinstalled after an operating system failure. All other backup options back up smaller increments of data, such as volume groups or select file systems.

Understanding Incremental Backups

Incremental backups make it possible to back up only data that has changed since a prior backup, significantly reducing the backup time and media usage. Incremental backups can be performed for both volume group and file system backups.

You perform an incremental backup by indicating an incremental backup level. This level indicates that only files that have changed since the most recent previous level should be included in the backup. Specifying `level 0` indicates that all files should be backed up. Level 0 is still considered an incremental level; it is the base for all incremental levels that follow.

Any number of incremental levels from 0 through 9 can be used, but using too many levels can complicate the restore process.

Consider the following incremental backup examples:

Incremental backup of a file system is performed as follows:

```
Monday     Level 0
Tuesday    Level 1
Wednesday  Level 2
Thursday   Level 3
Friday     Level 4
Saturday   Level 5
Sunday     Level 6
```

In this case, if you need to restore the entire file system from the backup performed on Sunday, you must restore every single backup from 0 through 6 in order to incrementally reapply the changes to date. Always restore `level 0` first (when restoring from scratch) because only `level 0` contains a backup of the entire file system. Then, in the correct sequence, reapply each level that follows, which will add, replace, and remove files until the file systems return to their most recent state.

`Example`: **Incremental backup of all volume groups, except the rootvg group, is performed as follows:**

```
1st of month      Level 0
Every Friday      Level 4
Monday - Thursday   Level 7
```

In this example, a volume group backup is performed on the first day of the month. Every Friday a `level 4` is performed, and every other day of the week (excluding Saturday and Sunday) a `level 7` is performed. Because only three levels are used, no more than three backups need to be restored. If you need to restore the entire volume group because of failure, the restore sequence would be:

1. Restore `level 0`.
2. Restore the most recent `level 4` if a level 4 was performed since the last level 0.
3. Restore the most recent `level 7` if a level 7 was performed since the last level 4 or level 0.

Note: Use care when combining both volume group and file system incremental backups. An incremental volume group backup is identical to performing an incremental backup of each individual logical volume and file system in the volume group. Therefore, after performing a volume group `level 0` backup, you can perform other incremental backup levels for specific file systems. If a `level 0` backup of a file system is performed after a `level 0` of the volume group containing that file system, any higher-level incremental levels for that file system are applied to the *most recent* file system backup.

For volume group incremental backups, an entire logical volume is included if any part of the logical volume has changed. If no data in the logical volume has changed, the logical volume is not included in the backup.

Understanding Pull Backups

Pull Backups help you centrally manage your backups by enabling you to initiate, and thereby control, backup operations from a single location. You can further automate this central management of backups using the SysBack Scheduling and Scripting functions described in Chapter 22, "Scheduled Backups and Scripts," on page 329.

The machine that "pulls" the backup is called the "initiator" while the machine that is backed up is called the "backup system". The machine that receives that backup data is called the "data destination system".

Pull backup enablement requires, not only **Remote Services** configuration, but also **Remote Command Access** configuration. The Remote Services configuration enables the data to be sent across the network from the backup system to the data destination machine. The Remote Command Access configuration enables the initiator system to pull the backups from the backup system.

Pull Backups can be done in a two-way or three-way manner. When the initiator system is also the data destination system, this is a two-way backup. When the initiator system is a different machine than the data destination system, and different than the backup system, this is a three-way backup.

Note that for three-way backups, **Remote Services** must be configured between Machine A, the backup system, and Machine B, the data destination. **Remote Command Access** must be also configured between Machine A, the backup system, and Machine C, the backup initiator. For more information on configuring Remote Services and Remote Command Access, see Chapter 10, "Remote Services," on page 127.

The following SysBack backup options are discussed in this chapter:
- Backing up the System (Installation Image)
- Backing up Volume Groups
- Backing up File systems
- Backing up Logical Volumes
- Backing up Files or Directories

Backing up the System (Installation Image)

A system backup can be used in the following ways:
- To reinstall the entire system to its original state.
- To recreate or restore specific volume groups, file systems, or both on an already active system.
- To install a system backup created on one machine onto another machine with a different processor, platform type, or other system devices. This is called *cloning*. However, the machine being backed up must have installed all of the device and kernel support for the destination platform type, processor type and any other required devices.

To back up the entire system:

1. From the **Backup & Recovery Options** menu, select **Backup the System (Installation Image)**.

   Notes:

   a. You must be logged in to the system as a root user.

   b. At a command line, type `smitty sb_sysback`.

2. If there are volume groups on the system other than rootvg, select the volume groups to include in the backup. From the list of volume groups, either select **none (rootvg only)** or highlight each additional volume group to include and press F7. Press Enter to continue.

3. On the Device Selector screen, highlight the device you want to use and press Enter.
4. One of the following screens is displayed. These screens show the default options and values available when you back up to either a local tape drive or a disk image file.

```
                          Backup the System


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  Hostname of server             hambone.austin.ibm.com
  Device name               /dev/rmt0
  Create a Power Backup?          no
  Platform/kernel type for tape boot image    [rspc]
  Report output type           progress indicator
  Network install support to include      []
  Include non-JFS logical volumes?        yes
  Limit Logical Volume and Disk Information    no
  Rewind tape before starting backup?      yes
  Forward to End of Tape before Starting Backup   no
  Compress data before writing to media?     no
  User description              []
  User description information file      []
  Buffer size (in Kbytes)          [64]
  Preserve physical partition mapping?     no
  [MORE]

F1=Help           F2=Refresh         F3=Cancel          F4=List
F5=Reset          F6=Command         F7=Edit            F8=Image
F9=Shell          F10=Exit           Enter=Do
```

Figure 17. Default Options Available for Backing Up to Tape

```
                          Backup the System


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  Backup Data Hostname                   hambone.austin.ibm.com
  Images directory                       /sysback.images/fatrat>
  Create a Power Backup?                 no                    +
  Backup file ID                         [03061826]
  Dynamically Created Backup File ID     no                    +
  Report output type                     progress indicator    +
  Include non-JFS logical volumes?       yes                   +
  Compress data before writing to media? yes                   +
  User description                       []
  Host read permission                   all hosts             +
  User read permission                   all users             +
  Buffer size (in Kbytes)                [64]                  +#
  Preserve physical partition mapping?   no                    +
  [MORE]

F1=Help           F2=Refresh         F3=Cancel          F4=List
F5=Reset          F6=Command         F7=Edit            F8=Image
F9=Shell          F10=Exit           Enter=Do
```

Figure 18. Default Options Available for Backing Up to Disk Image File

The fields have the following definitions:

Backup Data Hostname

The hostname of the data destination system on which the

selected backup device or file exists. You may edit this field as necessary to specify a the hostname of a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Device name   The device, if a tape drive or virtual device was selected. You may edit this field as necessary to specify a device on a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Images directory

The directory name, if previously selected. You cannot change this field from this screen.

Create a Power Backup?

Default=no. Use Tab to change this field to "yes" if you want this backup to be a "Power" backup. A **Power Backup** backs up all file systems as "raw" logical volumes, which usually provides much better backup and restore performance, but imposes the following limitations:

- You can restore only raw logical volumes from this backup. Therefore, when choosing to restore data from the backup, you will be allowed to restore only an entire logical volume and only if it is inactive. Because of this, you cannot restore any individual files or directories, only entire file systems; and no file systems, such as /, /usr and /var can be restored since they are always active.

- Because all file systems are backed up as raw logical volumes, the entire logical volume is backed up even if only a portion of the file system is being used. If this were the case with all file systems, the backup and installation would likely take longer than if not performing a Power Backup.

- When installing or recreating volume groups or logical volumes from this backup, you cannot change the following attributes:
  - File system attributes
  - Logical volume name
  - Logical volume size
  - The volume group in which you want to create a logical volume

Backup file ID

Default=date/time (MMDDhhmm). Uniquely identifies the backup. You can change this field to any value but it cannot contain single (') or double (") quotes. This field is active only when you back up to a disk image file.

Dynamically Created Backup File ID

This option lets you generate a dynamic backup file ID. It uses the same current date and time values at the time of command execution as the ID. If the value of the **Dynamically Created Backup File ID** field set to yes, it will overwrite the **Backup File ID** field.

Report output type

Default=progress indicator. Keep the default value if you want to display a progress indicator during the backup process,

which indicates the approximate total backup time and amount completed. Press Tab to select "file list" if you want to display a list of files as they are being backed up, or Tab once more to show "only errors" that occur during the backup.

Platform/kernel type for tape boot image

Default=current platform/kernel type. This field is displayed only when you use a tape drive or virtual device. The field does not display a value if the current platform does not support tape boot or the necessary tape boot support is not installed. Change this field only if you are creating a backup that you want to install or "clone "onto another machine where the platform type or kernel is different. Press F4 to list the platforms/kernels that have tape boot support installed on the system and select from the list.

The following platform/kernel types are currently supported:

chrp	Common Hardware Reference Platform
chrp/MP	Multiprocessor Common Hardware Reference Platform
rs6k	RISC System/6000 (uniprocessor)
rs6k/MP	Multiprocessor RISC System/6000
rspc	PCI-based (PC) RISC System/6000 (uniprocessor)
rspc/MP	Multiprocessor PCI-based (PC) RISC System/6000

The first part of the selection is the platform type. The second part (/MP) indicates the kernel type. If the kernel type portion is omitted, a uniprocessor (single processor) kernel is assumed.

Network install support to include

Default=(Blank/None). If, after starting a system from this backup tape, you want the ability to perform a network installation (rather than installing from this backup), press **F4** to display a list of supported network types and select one from the list. You must select the network type of the adapter that you want to use for the system install.

Include non-JFS logical volumes?

Default=yes. To exclude all non-journaled file systems (raw logical volumes) from the backup, press Tab to change the value to "no". If you select "no" to this option, all raw logical volume data is excluded from the backup, but the logical volume structures can be recreated using the LVM information contained in the backup. If you select "yes", all raw logical volumes are included on the backup *unless* you specifically excluded them in an*exclude list*.

Limit Logical Volume and Disk Information

Use these options to control the amount of LVM data which is collected during backup. When recovering a system in which all of the volume group, logical volume, file system and physical disk information is stored, the preprocessing required to read and to display the installation options can be time

consuming. When the system being recovered is a different system from which the backup was created, the preprocessing can take even longer. If you are only recovering part of the system, you may want to limit the amount of disk preprocessing required for you specific recovery scenario. There are 3 options related to the collection of disk and LVM information:

No   This is default option. All of the active volume group, logical volume, file system, and physical disk information will be included in the backup regardless of whether or not the volume group has been specified for backup.

Example: The system has 3 active volume groups named, rootvg, sbvg, and datavg. When performing the backup, you only specify to include the rootvg volume group. With the "No" option set, all of the LVM and disk structure information will be collected for all three volume groups.

Disk   This option works just as the default "No" option except that disk information will not be collected for any disk that is not associated with an active volume group. As with the "No" option, this information is collected for all volume groups regardless of whether or not the volume group has been specified for backup.

Example: If the "lspv" command shows the following output:

hdisk0 000ac63cb85d28d4 rootvg active

hdisk1 000ac63cea9291ab sbvg active

hdisk2 000ac63cea9291ac none active

the hdisk0 and hdisk1 disk information would be included in the back but the information for hdisk2 would not.

LVM and Disk
This option works just as the default "No" option except that it applies only to volume groups that have been specified for backup.

Example: The system has 3 active volume groups named, rootvg, sbvg, and datavg. If you specified only the rootvg volume group for backup:

- all of the LVM and disk structure information for rootvg will be backed up
- none of the LVM and disk structure information sbvg and datavg will be backed up

Rewind tape before starting backup?
Default=yes. Press Enter to rewind the tape before the backup begins. If you are placing multiple backup images onto a single tape, then select "no" to place this backup on the tape at the current location. This option is displayed only when you back up to a tape device. For a system backup, tape boot information is placed on the tape at the beginning of the first backup. This information is not placed on the tape for subsequent backups.

Note: If this is the first backup to this tape, or if you have restarted the system, reinserted the tape, or changed the

tape drive block size, you should select to rewind the tape. Only if you completed another backup and have not performed any of these functions will the tape be positioned correctly at the end of the previous backup image.

Forward to End of Tape Before Starting Backup

This option lets you fast forward to the end of the last SysBack backup on the tape for all backup types. Use this option when stacking multiple backups on the same tape that has been rewound or ejected. This options should also be used when the system has been restarted or the block size of the tape drive has been changed from the last backup. This eliminates having to manually position the tape before stacking a backup image.

Compress data before writing to media?

Default="no" for tapes and "yes" for disk image backups. Press Tab to change the option. "yes" indicates that the data will be compressed before it is written to the backup media. Compressing the data usually increases backup performance and uses between 25 and 40% less space on the media. For best performance, do not select this option if the backup device provides its own hardware data compression. Compressing data with the software uses considerably more CPU cycles to process the data.

User description

Default=(Blank/None). Enter up to 60 characters of descriptive information to add to the volume label on the backup. Do not use single (') or double (") quotation marks in the description.

User description information file

Use this option to specify a file name that contains the user description for this backup. This is useful when your description contains characters not supported by the User Description SMIT option. Also, this is useful when using ASCII SMIT or an ASCII console as they do not support the input of Double-byte characters (DBCS) or Bidirectional (Bi-Di) text.

Host read permission

Default=all hosts. By default, all hosts with access to the system on which this file is written have permission to read, or restore from this image. Press Tab to limit read permission to the original host or the server on which the file is written. This option is active only when you back up to a disk image file.

User read permission

Default=all users. By default, any user on a host with access to the system and directory on which this file is written has permission to read, or restore from, this image. Press Tab to limit the read permission to only the original user, the root user on the original host, or the server to which the file is written. This option is active only when you back up to a disk image file.

Buffer size (In Kbytes)

Default=64. Changing this value either increases or decreases the amount of data that is written to the output device in a single I/O operation. Some devices with small buffers might

require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value. This value must be a multiple of the tape block size.

Preserve physical partition mapping?

Default=no. Selecting "yes" to this option ensures that all logical volumes will be recreated from this backup using the same physical partitions that are currently allocated to them. Unless the logical volumes were originally created using physical partition maps, it is generally recommended that they not be recreated using the same partitions, because this preserves fragmentation that develops over time as logical volumes and file systems expand.

When you recreate a volume group or logical volume or perform a system installation, you can choose whether or not to use the prior partition map. If the original physical volumes do not exist or are not large enough to contain the same partitions, the logical volumes will be recreated without using the maps.

Exclude list file name

Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/ .exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup.

Device name for remote volume prompt

Default=(Blank/None). Enter a TTY, LFT or PTS device name to send the volume prompt to a specified device rather than to the current SMIT screen. If you are backing up to a remote host, the device name you specify is attached to the remote host. This field is displayed only when the backup device is a tape drive or virtual device.

Examples of device names are */dev/tty0*, */dev/lft0* and */dev/pts/5*. You can determine the terminal device name by typing `tty` at the command line on that device.

Hostname to Backup

The hostname of the backup system, the machine that will send its data to the data destination server.

Temporary work space directory

Default=blank. Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

Overwrite existing backup with same ID?

Default=no. If the **Backup File ID** field contains a value already used for an existing system backup, change this field to "yes" by pressing Tab. Doing so indicates that you want to overwrite the previous backup with this backup. After you begin this

backup, the prior disk image files are removed and cannot be recovered. This field is displayed only when you back up to a disk image file.

File containing a list of data to be backed up

Default=blank. Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

Note: This use of wild cards in this list is not supported.

In all other cases, use of this option is not required as the specification of non-rootvg volume groups is indicated in the field **Non-rootvg volume groups to include**.

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of one file, directory, logical volume, file system, or volume group name.

Note: This option must also be used when you are specifying a volume group name that has:

- a space in the name
- characters in the name that are interpreted by the shell as special. For example: @, * . , $
- characters in the name

Specifying a volume group name with these characteristics in the **Non-rootvg volume groups to include** field will cause the process to error.

Invisible backup?

If you would like the `atime` and `mtime` values of your files to be returned to their pre-backup values once the backup is completed, set this option to "yes". The `atime` and `mtime` of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures, i.e. " rc=0 or rc=1", a process will be started automatically to reset these values immediately following the backup.

Note: The `atime` and `mtime` values are collected at the start of backup processing immediately prior to backing up the files. If the `atime` or `mtime` of a file is modified during the backup process, the original `atime` and `mtime` values stored by the backup preprocessing will be restored at the end of the backup.

Note: Invoking this option will increase the amount of time that it takes for the backup process to execute.

Eject tape at end of backup?

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

Backup Extended Attributes (AIX 5.3+) only

Specifies to backup any ACLs or named extended attributes. Without this option, the image will include only AIXC ACLs and PCLs in the archive along with the other regular file data. For files containing NFS4 ACLs, conversion to AIXC will happen during the archival by default.

Eject all write protected tapes

Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

CD/DVD Media Size

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file `SB.sysback1.hd2` needs to be split, another file called `SB.sysback1.hd2.2` would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

Media Available Space

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD number one. It is the total size left after creating the boot images, adding of the device filesets, and populating of the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size value minus 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split, another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

Format backup image on a 2gb limit?

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Ignore invalid backup objects?

Use this option to indicate if the backup should continue when it encounters any invalid backup objects. The default is "No".

Yes

If this option selected, the process will issue a warning message and continue. Once the backup finishes, it would exit with a return code of 1.

No

If this option is selected, the process will issue an error message and terminate. Once the backup terminates, it would exit with a return code of 2.

Volume Groups to include

Default displays the volume groups previously selected, if any. You can add or delete volume groups from this list to include

or exclude them from the backup. You can also press F4 to list the available volume groups and select from the list using F7.

5. After verifying all selections made above, press Enter to begin the backup.

If you selected to back up to tape, the tape block size is automatically changed to 512-byte blocks for writing the boot and installation images on the tape. This is necessary for the installation process to properly read the tape. After the boot and installation images are written to the tape, the block size is changed back to the original value and the remainder of the backup is written.

This process calculates and records certain information about your system configuration for later use by the installation process. The boot images are then placed on the tape, followed by each file system or logical volume in the selected volume groups.

Pre-Backup Script: If you created a custom script to run before the system backup, it runs first. This script might mail a message to users, remove temporary files, stop applications, or other similar functions. Refer to Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487 for information on creating pre-backup scripts.

Post-Backup Script: If you created a custom script to run after the completion of the system backup, it runs after the backup is complete and before the tape is rewound and verified. This script might mail a message to users or re-enable applications that were disabled prior to the backup starting. Refer to Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487 for information on creating post-backup scripts.

Backing up Volume Groups

If your system is organized such that the physical volumes, or hard disks, are placed into separate volume groups, then you probably want to back up these volume groups independently, for the following reasons.

First, data in different volume groups might require backups to be performed at different frequencies. For instance, critical data changed daily should be backed up at least once daily. Application programs or history files might not change on a daily basis and might be only backed up on a weekly or monthly basis.

Secondly, the most common hardware failure in any computer system is a hard disk failure. If a single disk fails within a volume group, you want to replace the disk and restore only the data in that one volume group. Separately backing up each volume group enables you to restore only a single volume group without touching the rest of the data on the system.

You can use the **Backup Volume Groups** option to back up one or more volume groups. All file systems and logical volumes in the selected volume groups are included on the backup unless they are specified in the exclude list.

Note: Do not use this option to back up the files in the rootvg volume group. To create a backup of the rootvg volume group, which can be used to reinstall the system, use the **Backup the System (Installation Image)** option. If you use the **Backup Volume Groups** option to backup the rootvg volume group, you can restore individual files from the backup but cannot reinstall the system.

Files, directories, or logical volumes contained in the *exclude list* are not included in the backup. If a file system mount point is contained in the exclude list, the entire file system is ignored. However, the information pertaining to all file system and logical volume structures is recorded to enable the recreation of the file systems or logical volumes as requested.

Before performing a volume group backup, log in to the system as a root user. This ensures that you have the appropriate permissions to read all of the files in the volume groups.

To back up one or more volume groups:

1. From the **Backup Options** menu, select **Backup Volume Groups**.

   Note: From a command line, type `smitty sb_mkvgback`.

2. Select the volume group or groups to include in the backup from the list displayed. To select a single group, highlight the group and press Enter. To select multiple groups, highlight each group and press F7. Then, press Enter to continue.

3. On the Device Selector screen, highlight the device you want to use and press Enter.

4. One of the following screens is displayed. These screens show the default options and values available when you back up to either a local tape drive or a disk image file.

```
                          Backup a VOlume Group


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                [Entry Fields]
  Hostname of server              hambone.austin.ibm.com
  Device name                /dev/rmt0
  Create a Power Backup?          no
  Platform/kernel type for tape boot image    [rspc]
  Report output type              progress indicator
  Network install support to include      []
  Include non-JFS logical volumes?      yes
  Limit Logical Volume and Disk Information    no
  Rewind tape before starting backup?      yes
  Forward to End of Tape before Starting Backup   no
  Compress data before writing to media?    no
  User description              []
  User description information file      []
  Buffer size (in Kbytes)          [64]
  Preserve physical partition mapping?      no
  [MORE]

F1=Help          F2=Refresh        F3=Cancel          F4=List
F5=Reset         F6=Command        F7=Edit            F8=Image
F9=Shell         F10=Exit          Enter=Do
```
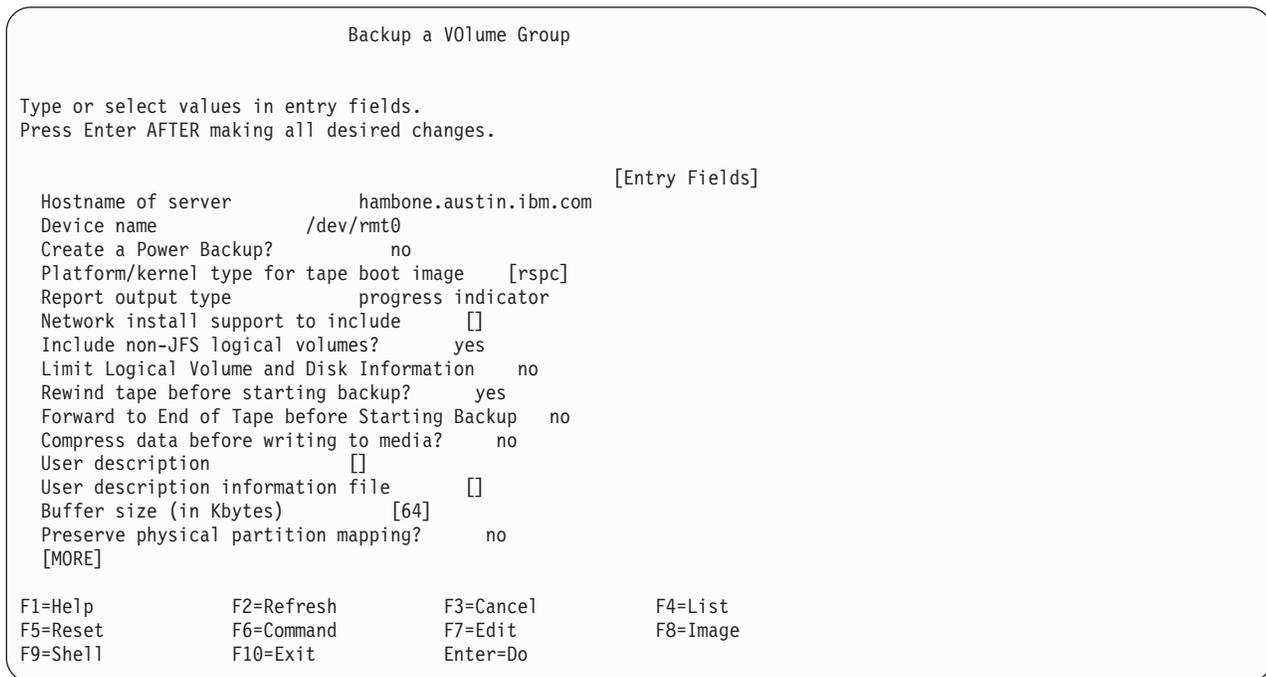
Figure 19. Default Options and Values Available When Backing Up to a Local Tape Drive

```
                         Backup a Volume Group


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                  [Entry Fields]
  Backup Data Hostname          hambone.austin.ibm.com
  Images directory              /sysback.images/lasher>
  Backup file ID          [03071030]
  Dynamically Created Backup File ID     no
  Report output type          progress indicator
  Compress data before writing to media?    yes
  Incremental backup level (0=full)     []
  Include non-JFS logical volumes?      yes
  User description          []
  User description information file    []
  Limit Logical Volume and Disk Information   no
  Host read permission        all hosts
  User read permission        all users
  Buffer size (in Kbytes)       [64]
  Preserve physical partition mapping?     no
  Overwrite existing backup with same ID?    no
  [MORE]


F1=Help             F2=Refresh        F3=Cancel         F4=List
F5=Reset            F6=Command        F7=Edit           F8=Image
F9=Shell            F10=Exit          Enter=Do
```

Figure 20. Default Options and Values Available When Backing Up to Disk Image File

The fields have the following definitions:

Backup Data Hostname

The hostname of the data destination system on which the
selected backup device or file exists. You may edit this field as
necessary to specify a the hostname of a remote system not
listed in the device selector dialog screen. This is useful when
initiating a Pull Backup.

Device name   The device, if a tape drive or virtual device was selected. You
may edit this field as necessary to specify a device on a remote
system not listed in the device selector dialog screen. This is
useful when initiating a Pull Backup.

Images directory

The directory name, if previously selected. You cannot change
this field from this screen.

Create a Power Backup?

Default=no. Use Tab to change this field to "yes" if you want
this backup to be a "Power" backup. A **Power Backup** backs up
all file systems as "raw" logical volumes, which usually
provides much better backup and restore performance, but
imposes the following limitations:

• You can restore only raw logical volumes from this backup.
Therefore, when choosing to restore data from the backup,
you will be allowed to restore only an entire logical volume
and only if it is inactive. Because of this, you cannot restore
any individual files or directories, only entire file systems;
and no file systems, such as /, /usr and /var can be restored
since they are always active.

• Because all file systems are backed up as raw logical
volumes, the entire logical volume is backed up even if only

a portion of the file system is being used. If this were the case with all file systems, the backup and installation would likely take longer than if not performing a Power Backup.

- When installing or recreating volume groups or logical volumes from this backup, you cannot change the following attributes:

    – File system attributes

    – Logical volume name

    – Logical volume size

    – The volume group in which you want to create a logical volume

Backup file ID

Default=date/time (MMDDhhmm). Uniquely identifies the backup. You can change this field to any value but it cannot contain single (') or double (″) quotes. This field is active only when you back up to a disk image file.

Dynamically Created Backup File ID

This option lets you generate a dynamic backup file ID. It uses the same current date and time values at the time of command execution as the ID. If the value of the **Dynamically Created Backup File ID** field set to yes, it will overwrite the **Backup File ID** field.

Incremental backup level (0=full)

Default=(Blank/None). To perform an incremental backup of the volume group, enter an incremental level. Level 0 indicates a backup of all files and logical volumes. Leaving this field blank also backs up all files and logical volumes but the previous level 0 incremental backup information, if any, is not overwritten. Please refer to "Understanding Incremental Backups" on page 19 for additional details.

Report output type

Default=progress indicator. Keep the default value if you want to display a progress indicator during the backup process, which indicates the approximate total backup time and amount completed. Press Tab to select "file list" if you want to display a list of files as they are being backed up, or Tab once more to show "only errors" that occur during the backup.

Compress data before writing to media?

Default="no" for tapes and "yes" for disk image backups. Press Tab to change the option. "yes" indicates that the data will be compressed before it is written to the backup media. Compressing the data usually increases backup performance and uses between 25 and 40% less space on the media. For best performance, do not select this option if the backup device provides its own hardware data compression. Compressing data with the software uses considerably more CPU cycles to process the data.

Include non-JFS logical volumes?

Default=yes. To exclude all non-journaled file systems (raw logical volumes) from the backup, press Tab to change the value to "no". If you select "no" to this option, all raw logical volume data is excluded from the backup, but the logical

volume structures can be recreated using the LVM information contained in the backup. If you select "yes", all raw logical volumes are included on the backup *unless* you specifically excluded them in an*exclude list*.

User description

Default=(Blank/None). Enter up to 60 characters of descriptive information to add to the volume label on the backup. Do not use single (') or double (") quotation marks in the description.

User description information file

Use this option to specify a file name that contains the user description for this backup. This is useful when your description contains characters not supported by the User Description SMIT option. Also, this is useful when using ASCII SMIT or an ASCII console as they do not support the input of Double-byte characters (DBCS) or Bidirectional (Bi-Di) text.

Limit Logical Volume and Disk Information

Use these options to control the amount of LVM data which is collected during backup. When recovering a system in which all of the volume group, logical volume, file system and physical disk information is stored, the preprocessing required to read and to display the installation options can be time consuming. When the system being recovered is a different system from which the backup was created, the preprocessing can take even longer. If you are only recovering part of the system, you may want to limit the amount of disk preprocessing required for you specific recovery scenario. There are 3 options related to the collection of disk and LVM information:

No

This is default option. All of the active volume group, logical volume, file system, and physical disk information will be included in the backup regardless of whether or not the volume group has been specified for backup.

Example: The system has 3 active volume groups named, rootvg, sbvg, and datavg. When performing the backup, you only specify to include the rootvg volume group. With the "No" option set, all of the LVM and disk structure information will be collected for all three volume groups.

Disk

This option works just as the default "No" option except that disk information will not be collected for any disk that is not associated with an active volume group. As with the "No" option, this information is collected for all volume groups regardless of whether or not the volume group has been specified for backup.

Example: If the "lspv" command shows the following output:

hdisk0 000ac63cb85d28d4 rootvg active

hdisk1 000ac63cea9291ab sbvg active

hdisk2 000ac63cea9291ac none active

the hdisk0 and hdisk1 disk information would be included in the back but the information for hdisk2 would not.

LVM and Disk

This option works just as the default "No" option except that it applies only to volume groups that have been specified for backup.

Example: The system has 3 active volume groups named, rootvg, sbvg, and datavg. If you specified only the rootvg volume group for backup:

- all of the LVM and disk structure information for rootvg will be backed up
- none of the LVM and disk structure information sbvg and datavg will be backed up

Host read permission

Default=all hosts. By default, all hosts with access to the system on which this file is written have permission to read, or restore from this image. Press Tab to limit read permission to the original host or the server on which the file is written. This option is active only when you back up to a disk image file.

User read permission

Default=all users. By default, any user on a host with access to the system and directory on which this file is written has permission to read, or restore from, this image. Press Tab to limit the read permission to only the original user, the root user on the original host, or the server to which the file is written. This option is active only when you back up to a disk image file.

Rewind tape before starting backup?

Default=yes. Press Enter to rewind the tape before the backup begins. If you are placing multiple backup images onto a single tape, then select "no" to place this backup on the tape at the current location. This option is displayed only when you back up to a tape device. For a system backup, tape boot information is placed on the tape at the beginning of the first backup. This information is not placed on the tape for subsequent backups.

Note: If this is the first backup to this tape, or if you have restarted the system, reinserted the tape, or changed the tape drive block size, you should select to rewind the tape. Only if you completed another backup and have not performed any of these functions will the tape be positioned correctly at the end of the previous backup image.

Forward to End of Tape Before Starting Backup

This option lets you fast forward to the end of the last SysBack backup on the tape for all backup types. Use this option when stacking multiple backups on the same tape that has been rewound or ejected. This options should also be used when the system has been restarted or the block size of the tape drive has been changed from the last backup. This eliminates having to manually position the tape before stacking a backup image.

Buffer size (In Kbytes)

Default=64. Changing this value either increases or decreases the amount of data that is written to the output device in a

single I/O operation. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value. This value must be a multiple of the tape block size.

Preserve physical partition mapping?
Default=no. Selecting "yes" to this option ensures that all logical volumes will be recreated from this backup using the same physical partitions that are currently allocated to them. Unless the logical volumes were originally created using physical partition maps, it is generally recommended that they not be recreated using the same partitions, because this preserves fragmentation that develops over time as logical volumes and file systems expand.

When you recreate a volume group or logical volume or perform a system installation, you can choose whether or not to use the prior partition map. If the original physical volumes do not exist or are not large enough to contain the same partitions, the logical volumes will be recreated without using the maps.

Device name for remote volume prompt
Default=(Blank/None). Enter a TTY, LFT or PTS device name to send the volume prompt to a specified device rather than to the current SMIT screen. If you are backing up to a remote host, the device name you specify is attached to the remote host. This field is displayed only when the backup device is a tape drive or virtual device.

Examples of device names are */dev/tty0*, */dev/lft0* and */dev/pts/5*. You can determine the terminal device name by typing `tty` at the command line on that device.

Overwrite existing backup with same ID?
Default=no. If the **Backup File ID** field contains a value already used for an existing system backup, change this field to "yes" by pressing Tab. Doing so indicates that you want to overwrite the previous backup with this backup. After you begin this backup, the prior disk image files are removed and cannot be recovered. This field is displayed only when you back up to a disk image file.

Exclude list file name
Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/ .exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup.

Hostname to Backup
The hostname of the backup system, the machine that will send its data to the data destination server.

Temporary work space directory
Default=blank. Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location.

Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

File containing a list of data to be backed up

Default=blank. Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

Note: This use of wild cards in this list is not supported.

In all other cases, use of this option is not required as the specification of non-rootvg volume groups is indicated in the field **Non-rootvg volume groups to include**.

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of one file, directory, logical volume, file system, or volume group name.

Note: This option must also be used when you are specifying a volume group name that has:
- a space in the name
- characters in the name that are interpreted by the shell as special. For example: @, * . , $
- characters in the name

Specifying a volume group name with these characteristics in the **Non-rootvg volume groups to include** field will cause the process to error.

Invisible backup?

If you would like the `atime` and `mtime` values of your files to be returned to their pre-backup values once the backup is completed, set this option to "yes". The `atime` and `mtime` of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures, i.e. " rc=0 or rc=1", a process will be started automatically to reset these values immediately following the backup.

Note: The `atime` and `mtime` values are collected at the start of backup processing immediately prior to backing up the files. If the `atime` or `mtime` of a file is modified during the backup process, the original `atime` and `mtime` values stored by the backup preprocessing will be restored at the end of the backup.

Note: Invoking this option will increase the amount of time that it takes for the backup process to execute.

Eject tape at end of backup?

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0   "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1   "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2   "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

Backup Extended Attributes (AIX 5.3+) only

Specifies to backup any ACLs or named extended attributes. Without this option, the image will include only AIXC ACLs and PCLs in the archive along with the other regular file data. For files containing NFS4 ACLs, conversion to AIXC will happen during the archival by default.

Eject all write protected tapes

Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

CD/DVD Media Size

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file `SB.sysback1.hd2` needs to be split, another file called `SB.sysback1.hd2.2` would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

Media Available Space

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD number one. It is the total size left after creating the boot images, adding of the device filesets, and populating of the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size value minus 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split, another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

Format backup image on a 2gb limit?

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Ignore invalid backup objects?

Use this option to indicate if the backup should continue when it encounters any invalid backup objects. The default is "No".

Yes   If this option selected, the process will issue a warning message and continue. Once the backup finishes, it would exit with a return code of 1.

No   If this option is selected, the process will issue an error message and terminate. Once the backup terminates, it would exit with a return code of 2.

Volume Groups to include

Default displays the volume groups previously selected, if any. You can add or delete volume groups from this list to include

or exclude them from the backup. You can also press F4 to list the available volume groups and select from the list using F7.

5. After confirming the above entries, make sure the backup media is properly inserted in the drive and press Enter to begin the backup.

Note: If you are backing up to a tape drive, the tape will NOT be rewound upon completion of the backup. This enables you to perform additional backups without rewinding, thereby "stacking" the backups onto a single tape.

Backing up File systems

A file system backup can only be performed for mounted (active) file systems. Various file systems are often backed up at different intervals from each other or from the volume group or system backup, because the data in different file systems is changed at different intervals.

Because file systems are contained in the system and volume group backups, you do not need to back them up separately, unless you want to back up this data independently or more frequently.

All files and directories in the file systems are included in the backup unless you specify them in the exclude list. If the mount point of a File system to be backed up is also in the exclude list, the backup of the file system continues, but no files in the file system are included.

Before performing a file system backup, log in to the system as a root user. This ensures that you have the appropriate permissions to read all of the files in the file systems.

To back up one or more file systems:

1. From the **Backup Options** menu, select **Backup file systems**.

   Note: From a command line, type `smitty sb_mkfsback`.

2. Select a file system from the list of file system mount points. To select a single file system, highlight a directory and press Enter. To select multiple file systems, highlight each directory and press F7. When you've made all your selections, press Enter.

3. On the Device Selector screen, highlight the device you want to use and press Enter.

4. One of the following screens is displayed. These screens show the default options and values available when you back up to either a local tape drive or a disk image file.

```
                    Backup a Filesystem


 Type or select values in entry fields.
 Press Enter AFTER making all desired changes.

                                              [Entry Fields]
   Backup Data Hostname            hambone.austin.ibm.com
   Device name               /dev/rmt0
   Report output type            progress indicator
   Forward to End of Tape Before Starting Backup    no
   Rewind tape before starting backup?       yes
   Compress data before writing to media?     no
   Incremental backup level (0=full)       []
   User description                []
   User description information file       []
   Buffer size (in Kbytes)           [64]
   Preserve physical partition mapping?      no
   Device name for remote volume prompt      []
   [MORE]




 F1=Help             F2=Refresh        F3=Cancel         F4=List
 F5=Reset            F6=Command        F7=Edit           F8=Image
 F9=Shell            F10=Exit          Enter=Do
```
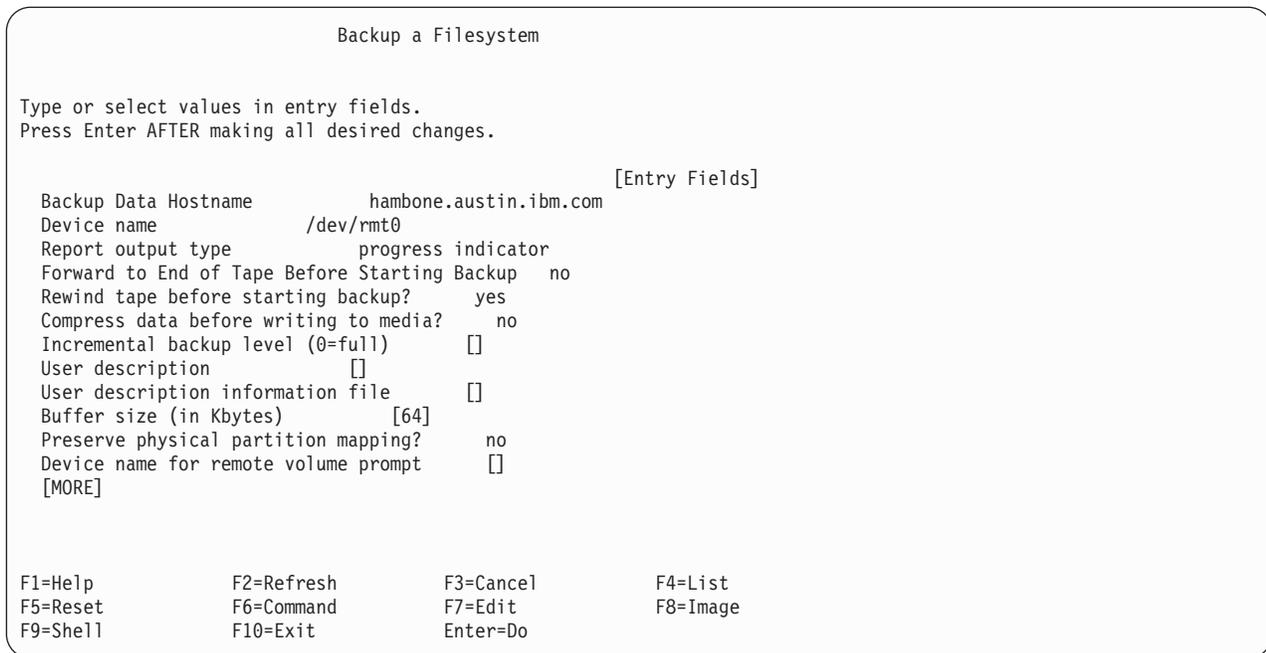
Figure 21. Default Options and Values Available When Backing Up to a Local Tape Drive

```
                    Backup a Filesystem


 Type or select values in entry fields.
 Press Enter AFTER making all desired changes.

                                              [Entry Fields]
   Backup Data Hostname            hambone.austin.ibm.com
   Images directory              /sysback.images/lasher>
   Backup file ID         [03071032]
   Dynamically Created Backup File ID     no
   Report output type            progress indicator
   Compress data before writing to media?     yes
   Incremental backup level (0=full)       []
   User description                []
   User description information file       []
   Host read permission          all hosts
   User read permission          all users
   Buffer size (in Kbytes)           [64]
   Preserve physical partition mapping?      no
   Overwrite existing backup with same ID?     no
   [MORE]

 F1=Help             F2=Refresh        F3=Cancel         F4=List
 F5=Reset            F6=Command        F7=Edit           F8=Image
 F9=Shell            F10=Exit          Enter=Do
```

Figure 22. Default Options and Values Available When Backing Up to Disk Image File

The fields have the following definitions:

Backup Data Hostname

> The hostname of the data destination system on which the
> selected backup device or file exists. You may edit this field as
> necessary to specify a the hostname of a remote system not
> listed in the device selector dialog screen. This is useful when
> initiating a Pull Backup.

Device name   The device, if a tape drive or virtual device was selected. You

may edit this field as necessary to specify a device on a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Images directory

The directory name, if previously selected. You cannot change this field from this screen.

Create a Power Backup?

Default=no. Use Tab to change this field to "yes" if you want this backup to be a "Power" backup. A **Power Backup** backs up all file systems as "raw" logical volumes, which usually provides much better backup and restore performance, but imposes the following limitations:

- You can restore only raw logical volumes from this backup. Therefore, when choosing to restore data from the backup, you will be allowed to restore only an entire logical volume and only if it is inactive. Because of this, you cannot restore any individual files or directories, only entire file systems; and no file systems, such as /, /usr and /var can be restored since they are always active.

- Because all file systems are backed up as raw logical volumes, the entire logical volume is backed up even if only a portion of the file system is being used. If this were the case with all file systems, the backup and installation would likely take longer than if not performing a Power Backup.

- When installing or recreating volume groups or logical volumes from this backup, you cannot change the following attributes:
  - File system attributes
  - Logical volume name
  - Logical volume size
  - The volume group in which you want to create a logical volume

Backup file ID

Default=date/time (MMDDhhmm). Uniquely identifies the backup. You can change this field to any value but it cannot contain single (') or double (") quotes. This field is active only when you back up to a disk image file.

Dynamically Created Backup File ID

This option lets you generate a dynamic backup file ID. It uses the same current date and time values at the time of command execution as the ID. If the value of the **Dynamically Created Backup File ID** field set to yes, it will overwrite the **Backup File ID** field.

Incremental backup level (0=full)

Default=(Blank/None). To perform an incremental backup of the file system, enter an incremental level. Level 0 indicates a backup of all files and logical volumes. Leaving this field blank also backs up all files and logical volumes but the previous level 0 incremental backup information, if any, is not overwritten. Please refer to"Understanding Incremental Backups" on page 19 for additional details.

Report output type

Default=progress indicator. Keep the default value if you want to display a progress indicator during the backup process, which indicates the approximate total backup time and amount completed. Press Tab to select "file list" if you want to display a list of files as they are being backed up, or Tab once more to show "only errors" that occur during the backup.

Compress data before writing to media?

Default="no" for tapes and "yes" for disk image backups. Press Tab to change the option. "yes" indicates that the data will be compressed before it is written to the backup media. Compressing the data usually increases backup performance and uses between 25 and 40% less space on the media. For best performance, do not select this option if the backup device provides its own hardware data compression. Compressing data with the software uses considerably more CPU cycles to process the data.

User description

Default=(Blank/None). Enter up to 60 characters of descriptive information to add to the volume label on the backup. Do not use single (') or double (") quotation marks in the description.

User description information file

Use this option to specify a file name that contains the user description for this backup. This is useful when your description contains characters not supported by the User Description SMIT option. Also, this is useful when using ASCII SMIT or an ASCII console as they do not support the input of Double-byte characters (DBCS) or Bidirectional (Bi-Di) text.

Host read permission

Default=all hosts. By default, all hosts with access to the system on which this file is written have permission to read, or restore from this image. Press Tab to limit read permission to the original host or the server on which the file is written. This option is active only when you back up to a disk image file.

User read permission

Default=all users. By default, any user on a host with access to the system and directory on which this file is written has permission to read, or restore from, this image. Press Tab to limit the read permission to only the original user, the root user on the original host, or the server to which the file is written. This option is active only when you back up to a disk image file.

Rewind tape before starting backup?

Default=yes. Press Enter to rewind the tape before the backup begins. If you are placing multiple backup images onto a single tape, then select "no" to place this backup on the tape at the current location. This option is displayed only when you back up to a tape device. For a system backup, tape boot information is placed on the tape at the beginning of the first backup. This information is not placed on the tape for subsequent backups.

> **Note:** If this is the first backup to this tape, or if you have restarted the system, reinserted the tape, or changed the

tape drive block size, you should select to rewind the tape. Only if you completed another backup and have not performed any of these functions will the tape be positioned correctly at the end of the previous backup image.

Forward to End of Tape Before Starting Backup

This option lets you fast forward to the end of the last SysBack backup on the tape for all backup types. Use this option when stacking multiple backups on the same tape that has been rewound or ejected. This options should also be used when the system has been restarted or the block size of the tape drive has been changed from the last backup. This eliminates having to manually position the tape before stacking a backup image.

Buffer size (In Kbytes)

Default=64. Changing this value either increases or decreases the amount of data that is written to the output device in a single I/O operation. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value. This value must be a multiple of the tape block size.

Preserve physical partition mapping?

Default=no. Selecting "yes" to this option ensures that all logical volumes will be recreated from this backup using the same physical partitions that are currently allocated to them. Unless the logical volumes were originally created using physical partition maps, it is generally recommended that they not be recreated using the same partitions, because this preserves fragmentation that develops over time as logical volumes and file systems expand.

When you recreate a volume group or logical volume or perform a system installation, you can choose whether or not to use the prior partition map. If the original physical volumes do not exist or are not large enough to contain the same partitions, the logical volumes will be recreated without using the maps.

Device name for remote volume prompt

Default=(Blank/None). Enter a TTY, LFT or PTS device name to send the volume prompt to a specified device rather than to the current SMIT screen. If you are backing up to a remote host, the device name you specify is attached to the remote host. This field is displayed only when the backup device is a tape drive or virtual device.

Examples of device names are */dev/tty0*, */dev/lft0* and */dev/pts/5*. You can determine the terminal device name by typing `tty` at the command line on that device.

Overwrite existing backup with same ID?

Default=no. If the **Backup File ID** field contains a value already used for an existing system backup, change this field to "yes" by pressing Tab. Doing so indicates that you want to overwrite the previous backup with this backup. After you begin this

backup, the prior disk image files are removed and cannot be recovered. This field is displayed only when you back up to a disk image file.

Exclude list file name
Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/ .exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup.

Hostname to Backup
The hostname of the backup system, the machine that will send its data to the data destination server.

Temporary work space directory
Default=blank. Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

File containing a list of data to be backed up
Default=blank. Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

Note: This use of wild cards in this list is not supported.

In all other cases, use of this option is not required as the specification of non-rootvg volume groups is indicated in the field **Non-rootvg volume groups to include**.

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of one file, directory, logical volume, file system, or volume group name.

Note: This option must also be used when you are specifying a volume group name that has:
- a space in the name
- characters in the name that are interpreted by the shell as special. For example: @, * . , $
- characters in the name

Specifying a volume group name with these characteristics in the **Non-rootvg volume groups to include** field will cause the process to error.

Invisible backup?

If you would like the `atime` and `mtime` values of your files to be returned to their pre-backup values once the backup is completed, set this option to "yes". The `atime` and `mtime` of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures, i.e. " rc=0 or rc=1", a process will be started automatically to reset these values immediately following the backup.

Note: The `atime` and `mtime` values are collected at the start of backup processing immediately prior to backing up the files. If the `atime` or `mtime` of a file is modified during the backup process, the original `atime` and `mtime` values stored by the backup preprocessing will be restored at the end of the backup.

Note: Invoking this option will increase the amount of time that it takes for the backup process to execute.

Eject tape at end of backup?

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

Backup Extended Attributes (AIX 5.3+) only

Specifies to backup any ACLs or named extended attributes. Without this option, the image will include only AIXC ACLs and PCLs in the archive along with the other regular file data. For files containing NFS4 ACLs, conversion to AIXC will happen during the archival by default.

Eject all write protected tapes

Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

CD/DVD Media Size

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file `SB.sysback1.hd2` needs to be split, another file called `SB.sysback1.hd2.2` would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

Media Available Space

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD number one. It is the total size left after creating the boot images, adding of the device filesets, and populating of the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size value minus 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file `SB.sysback1.hd2` needs to be split, another file called `SB.sysback1.hd2.2` would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

Format backup image on a 2gb limit?

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option

does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Ignore invalid backup objects?
Use this option to indicate if the backup should continue when it encounters any invalid backup objects. The default is "No".

Yes   If this option selected, the process will issue a warning message and continue. Once the backup finishes, it would exit with a return code of 1.

No   If this option is selected, the process will issue an error message and terminate. Once the backup terminates, it would exit with a return code of 2.

Filesystem(s) (directory names)
The file system mount points (directories) selected on the first selection screen, each separated by spaces. You can change the list by adding or removing file systems, or you can press F4 to list the mounted file systems on the system and use F7 to select one or more from the list. All file systems in this field, unless included in the exclude list, are included in this backup.

Directory names should be specified relative to the root (/) directory.

5. After confirming the above entries, make sure the backup media is properly inserted in the drive and press Enter to begin the backup.

Note: If you are backing up to a tape drive, the tape will NOT be rewound upon completion of the backup. This enables you to perform additional backups without rewinding, thereby "stacking" the backups onto a single tape.

Backing up Logical Volumes

This option is typically used to back up logical volumes that contain non-file system data, such as data written by various database products or custom applications.

Logical volumes are contained in the system and volume group backups, so you do not need to back them up separately, unless you want to back up this data independently or more frequently.

You can use this option to backup a file system logical volume only if the file system is unmounted before the backup is performed. For non-file system logical volumes, the backup can be performed even if the logical volume is active, but it is recommended that data not be changed in the logical volume during the backup to ensure the consistency of relational data during the backup.

Since logical volume names must be explicitly selected using this option, they are backed up even if they are listed in the exclude list.

To backup one or more logical volumes:

1. From the **Backup Options** menu, select **Backup Logical Volumes**.

   Note: From a command line, type `smitty sb_mklvback`.

2. Select a logical volume from the list of non-file system logical volumes and logical volumes with unmounted file systems. To select a single logical volume,

highlight the name and press Enter. To select multiple logical volumes, highlight each volume group and press F7. When you've made all your selections, press Enter.

3. On the Device Selector screen, highlight the device you want to use and press Enter.

4. One of the following screens is displayed. These screens show the default options and values available when you back up to either a local tape drive or a disk image file.

```
                        Backup a Logical Volume


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                 [Entry Fields]
  Backup Data Hostname           hambone.austin.ibm.com
  Device name                /dev/rmt0
  Show progress indicator?            yes
  Rewind tape before starting backup?      yes
  Forward to End of Tape Before Starting Backup    no
  Compress data before writing to media?      no
  User description              []
  User description information file       []
  Buffer size (in Kbytes)          [64]
  Preserve physical partition mapping?       no
  Device name for remote volume prompt      []
  [MORE]



  F1=Help             F2=Refresh         F3=Cancel          F4=List
 F5=Reset            F6=Command         F7=Edit            F8=Image
 F9=Shell            F10=Exit           Enter=Do
```

Figure 23. Default Options and Values Available When Backing Up to Tape

```
                         Backup a Logical Volume


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                 [Entry Fields]
  Backup Data Hostname          hambone.austin.ibm.com
  Images directory            /sysback.images/lasher>
  Backup file ID          [03071034]
  Dynamically Created Backup File ID     no
  Show progress indicator?         yes
  Compress data before writing to media?    yes
  User description            []
  User description information file      []
  Host read permission          all hosts
  User read permission          all users
  Buffer size (in Kbytes)         [64]
  Preserve physical partition mapping?     no
  Overwrite existing backup with same ID?    no
  [MORE]


 F1=Help             F2=Refresh         F3=Cancel          F4=List
 F5=Reset            F6=Command         F7=Edit            F8=Image
 F9=Shell            F10=Exit           Enter=Do
```

Figure 24. Default Options and Values Available When Backing Up to Disk Image File

The fields have the following definitions:

Backup Data Hostname

The hostname of the data destination system on which the selected backup device or file exists. You may edit this field as necessary to specify a the hostname of a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Device name The device, if a tape drive or virtual device was selected. You may edit this field as necessary to specify a device on a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Images directory

The directory name, if previously selected. You cannot change this field from this screen.

Create a Power Backup?

Default=no. Use Tab to change this field to "yes" if you want this backup to be a "Power" backup. A **Power Backup** backs up all file systems as "raw" logical volumes, which usually provides much better backup and restore performance, but imposes the following limitations:

- You can restore only raw logical volumes from this backup. Therefore, when choosing to restore data from the backup, you will be allowed to restore only an entire logical volume and only if it is inactive. Because of this, you cannot restore any individual files or directories, only entire file systems; and no file systems, such as /, /usr and /var can be restored since they are always active.

- Because all file systems are backed up as raw logical volumes, the entire logical volume is backed up even if only a portion of the file system is being used. If this were the case with all file systems, the backup and installation would likely take longer than if not performing a Power Backup.

- When installing or recreating volume groups or logical volumes from this backup, you cannot change the following attributes:
  - File system attributes
  - Logical volume name
  - Logical volume size
  - The volume group in which you want to create a logical volume

Backup file ID

Default=date/time (MMDDhhmm). Uniquely identifies the backup. You can change this field to any value but it cannot contain single (') or double (") quotes. This field is active only when you back up to a disk image file.

Dynamically Created Backup File ID

This option lets you generate a dynamic backup file ID. It uses the same current date and time values at the time of command execution as the ID. If the value of the **Dynamically Created Backup File ID** field set to yes, it will overwrite the **Backup File ID** field.

Incremental backup level (0=full)

> Default=(Blank/None). To perform an incremental backup of the logical volume, enter an incremental level. Level 0 indicates a backup of all files and logical volumes. Leaving this field blank also backs up all files and logical volumes but the previous level 0 incremental backup information, if any, is not overwritten. Please refer to"Understanding Incremental Backups" on page 19 for additional details.

Report output type

> Default=progress indicator. Keep the default value if you want to display a progress indicator during the backup process, which indicates the approximate total backup time and amount completed. Press Tab to select "file list" if you want to display a list of files as they are being backed up, or Tab once more to show "only errors" that occur during the backup.

Compress data before writing to media?

> Default="no" for tapes and "yes" for disk image backups. Press Tab to change the option. "yes" indicates that the data will be compressed before it is written to the backup media. Compressing the data usually increases backup performance and uses between 25 and 40% less space on the media. For best performance, do not select this option if the backup device provides its own hardware data compression. Compressing data with the software uses considerably more CPU cycles to process the data.

User description

> Default=(Blank/None). Enter up to 60 characters of descriptive information to add to the volume label on the backup. Do not use single (') or double (") quotation marks in the description.

User description information file

> Use this option to specify a file name that contains the user description for this backup. This is useful when your description contains characters not supported by the User Description SMIT option. Also, this is useful when using ASCII SMIT or an ASCII console as they do not support the input of Double-byte characters (DBCS) or Bidirectional (Bi-Di) text.

Host read permission

> Default=all hosts. By default, all hosts with access to the system on which this file is written have permission to read, or restore from this image. Press Tab to limit read permission to the original host or the server on which the file is written. This option is active only when you back up to a disk image file.

User read permission

> Default=all users. By default, any user on a host with access to the system and directory on which this file is written has permission to read, or restore from, this image. Press Tab to limit the read permission to only the original user, the root user on the original host, or the server to which the file is written. This option is active only when you back up to a disk image file.

Rewind tape before starting backup?

> Default=yes. Press Enter to rewind the tape before the backup

begins. If you are placing multiple backup images onto a single tape, then select "no" to place this backup on the tape at the current location. This option is displayed only when you back up to a tape device. For a system backup, tape boot information is placed on the tape at the beginning of the first backup. This information is not placed on the tape for subsequent backups.

Note: If this is the first backup to this tape, or if you have restarted the system, reinserted the tape, or changed the tape drive block size, you should select to rewind the tape. Only if you completed another backup and have not performed any of these functions will the tape be positioned correctly at the end of the previous backup image.

Forward to End of Tape Before Starting Backup

This option lets you fast forward to the end of the last SysBack backup on the tape for all backup types. Use this option when stacking multiple backups on the same tape that has been rewound or ejected. This options should also be used when the system has been restarted or the block size of the tape drive has been changed from the last backup. This eliminates having to manually position the tape before stacking a backup image.

Buffer size (In Kbytes)

Default=64. Changing this value either increases or decreases the amount of data that is written to the output device in a single I/O operation. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value. This value must be a multiple of the tape block size.

Preserve physical partition mapping?

Default=no. Selecting "yes" to this option ensures that all logical volumes will be recreated from this backup using the same physical partitions that are currently allocated to them. Unless the logical volumes were originally created using physical partition maps, it is generally recommended that they not be recreated using the same partitions, because this preserves fragmentation that develops over time as logical volumes and file systems expand.

When you recreate a volume group or logical volume or perform a system installation, you can choose whether or not to use the prior partition map. If the original physical volumes do not exist or are not large enough to contain the same partitions, the logical volumes will be recreated without using the maps.

Device name for remote volume prompt

Default=(Blank/None). Enter a TTY, LFT or PTS device name to send the volume prompt to a specified device rather than to the current SMIT screen. If you are backing up to a remote host, the device name you specify is attached to the remote host. This field is displayed only when the backup device is a tape drive or virtual device.

Examples of device names are */dev/tty0*, */dev/lft0* and */dev/pts/5*.
You can determine the terminal device name by typing `tty` at
the command line on that device.

Overwrite existing backup with same ID?
Default=no. If the **Backup File ID** field contains a value already
used for an existing system backup, change this field to "yes"
by pressing Tab. Doing so indicates that you want to overwrite
the previous backup with this backup. After you begin this
backup, the prior disk image files are removed and cannot be
recovered. This field is displayed only when you back up to a
disk image file.

Exclude list file name
Specify the fully qualified path and file name to use as the
exclude list. If this field is left blank, the backup will look for
the default exclude list located at: **/usr/lpp/sysback/
.exclude_list**. If the default exclude list does not exist or is null,
nothing will be excluded from the backup.

Hostname to Backup
The hostname of the backup system, the machine that will send
its data to the data destination server.

Temporary work space directory
Default=blank. Specify the fully qualified directory name of the
location where you would like SysBack to create its temporary
work files during this process. Work files created directly by
SysBack programs will be generated in the specified location.
Any AIX commands that SysBack may call will be unaffected
by this option. If no directory is specified, the default work
space location is **/tmp**.

File containing a list of data to be backed up
Default=blank. Specify the fully qualified path and filename to
a file that contains a list of the items that you would like to
back up.

This option is required when you attempting to specify entities
that can not be displayed on the current display screen such as
when using an ASCII terminal.

This option may also be used when the path and filenames of
the backup objects are so long that the command length plus
the backup object specification length exceed the 255 character
limitation for the AIX command line.

Note: This use of wild cards in this list is not supported.

In all other cases, use of this option is not required as the
specification of non-rootvg volume groups is indicated in the
field **Non-rootvg volume groups to include**.

When specifying a file list, the file must be formatted such that
each line of the file includes the fully qualified path of one file,
directory, logical volume, file system, or volume group name.

Note: This option must also be used when you are specifying a
volume group name that has:
- a space in the name

- characters in the name that are interpreted by the shell as special. For example: @, * . , $
- characters in the name

Specifying a volume group name with these characteristics in the **Non-rootvg volume groups to include** field will cause the process to error.

Eject tape at end of backup?

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

Backup Extended Attributes (AIX 5.3+) only

Specifies to backup any ACLs or named extended attributes. Without this option, the image will include only AIXC ACLs and PCLs in the archive along with the other regular file data. For files containing NFS4 ACLs, conversion to AIXC will happen during the archival by default.

Eject all write protected tapes

Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

CD/DVD Media Size

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split, another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. In the case of double sided media, you should only specify the

size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

Media Available Space

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD number one. It is the total size left after creating the boot images, adding of the device filesets, and populating of the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size value minus 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file `SB.sysback1.hd2` needs to be split, another file called `SB.sysback1.hd2.2` would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

Format backup image on a 2gb limit?

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Ignore invalid backup objects?

Use this option to indicate if the backup should continue when it encounters any invalid backup objects. The default is "No".

Yes

If this option selected, the process will issue a warning message and continue. Once the backup finishes, it would exit with a return code of 1.

No   If this option is selected, the process will issue an error message and terminate. Once the backup terminates, it would exit with a return code of 2.

Logical volume name(s)
The logical volume name or names selected on the first selection screen, each separated by spaces. You can change the list by adding or removing logical volume names, or press F4 to list the valid logical volumes on the system and use F7 to select one or more from the list.

5. After confirming the above entries, make sure the backup media is properly inserted in the drive and press Enter to begin the backup.

Note: If you are backing up to a tape drive, the tape will NOT be rewound upon completion of the backup. This enables additional backups to be performed (also without rewinding), thereby "stacking" the backups onto a single tape.

Backing up Files or Directories

Use this option to back up a single file or directory or a group of files or directories. You can also back up only the files that have changed within a certain number of days. This enables the files or directories specified to be backed up incrementally from day to day. For instance, you might choose to back up all files in a directory each Friday evening. Then, for each following day, you can choose to back up only the files that have changed in the last day. Keep in mind the following when using this option:

- One day equals exactly 24 hours. Therefore, if you perform a backup of a file at 1:00 am on Tuesday, and the same file is not read until 3:00 am on Wednesday, it will not be backed up if it was changed at 2:00 am on Tuesday, 25 hours ago. If files are changed during the backup period, it is often best to add an extra day to the backup increment for safety.

- For each sequential backup of a directory in which only one day of data is backed up, it might be necessary to perform many restores of many backups to restore the entire directory from scratch. For instance, if the directory was backed up in its entirely on the first of the month, and only a single day of changes was backed up each following days, it will take 22 different backups to restore the entire directory on the 22nd day of the month.

Unlike all other backup types, this type of backup contains no Logical Volume Manager (LVM) information. Therefore, you cannot use this backup, regardless of its contents, to recreate volume groups, logical volumes, or file systems. Using this backup option for backing up all files on the system (from the **/** directory) does *not* provide a backup that can be used to reinstall the system.

It is also important to note that some files and directories on the system, such as certain contents of the root (/) and /usr file systems, should never be restored from a backup in normal mode, as this would adversely affect the active system configuration and can cause either system errors or a complete system failure. Use this option only to back up files and directories that contain non-system-related information, such as user data and application programs.

To back up files or directories:

1. From the **Backup Options** menu, select **Backup Files or Directories**.

   Note: From a command line, type `smit sb_mkdirback`.

2. On the Device Selector screen, highlight the device you want to use and press Enter.
3. One of the following screens is displayed. These screens show the default options and values available when you back up to either a local tape drive or a disk image file.

```
                    Backup Files or Directories


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  Backup Data Hostname           hambone.austin.ibm.com
  Device name                /dev/rmt0
  Report output type             progress indicator
  Rewind tape before starting backup?      yes
  Forward to End of Tape Before Starting Backup   no
  Compress data before writing to media?     no
  Backup only files changed within #days (0=all)  [0]
  User description               []
  User description information file       []
  Buffer size (in Kbytes)           [64]
  Device name for remote volume prompt      []
  [MORE]



  F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 25. Default Options and Values Available When Backing Up to Tape

```
                    Backup Files or Directories


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  Backup Data Hostname           hambone.austin.ibm.com
  Images directory             /sysback.images/lasher>
  Backup file ID            [03071041]
  Dynamically Created Backup File ID      no
  Report output type             progress indicator
  Compress data before writing to media?     yes
  Backup only files changed within #days (0=all)  [0]
  User description               []
  User description information file       []
  Host read permission          all hosts
  User read permission          all users
  Buffer size (in Kbytes)           [64]
  Overwrite existing backup with same ID?     no
  [MORE]


F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 26. Default Options and Values Available When Backing Up to Disk Image File

The fields have the following definitions:

Backup Data Hostname

The hostname of the data destination system on which the selected backup device or file exists. You may edit this field as

necessary to specify a the hostname of a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Device name The device, if a tape drive or virtual device was selected. You may edit this field as necessary to specify a device on a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Images directory

The directory name, if previously selected. You cannot change this field from this screen.

Create a Power Backup?

Default=no. Use Tab to change this field to "yes" if you want this backup to be a "Power" backup. A **Power Backup** backs up all file systems as "raw" logical volumes, which usually provides much better backup and restore performance, but imposes the following limitations:

- You can restore only raw logical volumes from this backup. Therefore, when choosing to restore data from the backup, you will be allowed to restore only an entire logical volume and only if it is inactive. Because of this, you cannot restore any individual files or directories, only entire file systems; and no file systems, such as /, /usr and /var can be restored since they are always active.

- Because all file systems are backed up as raw logical volumes, the entire logical volume is backed up even if only a portion of the file system is being used. If this were the case with all file systems, the backup and installation would likely take longer than if not performing a Power Backup.

- When installing or recreating volume groups or logical volumes from this backup, you cannot change the following attributes:

    – File system attributes
    – Logical volume name
    – Logical volume size
    – The volume group in which you want to create a logical volume

Backup file ID

Default=date/time (MMDDhhmm). Uniquely identifies the backup. You can change this field to any value but it cannot contain single (') or double (") quotes. This field is active only when you back up to a disk image file.

Dynamically Created Backup File ID

This option lets you generate a dynamic backup file ID. It uses the same current date and time values at the time of command execution as the ID. If the value of the **Dynamically Created Backup File ID** field set to yes, it will overwrite the **Backup File ID** field.

Backup only files changed since #days (0=all)

Default=0. To backup only the files that have changed within a certain number of days, enter the number of days here. If, for instance, your last file or directory backup was at this time

yesterday, enter "1" to backup all files changed since that time. Note that a day is considered exactly 24 hours, so if your backup was earlier in the day yesterday than it was today, you should backup at least two days of changes. Refer to"Understanding Incremental Backups" on page 19 for additional details.

Report output type

Default=progress indicator. Keep the default value if you want to display a progress indicator during the backup process, which indicates the approximate total backup time and amount completed. Press Tab to select "file list" if you want to display a list of files as they are being backed up, or Tab once more to show "only errors" that occur during the backup.

Compress data before writing to media?

Default="no" for tapes and "yes" for disk image backups. Press Tab to change the option. "yes" indicates that the data will be compressed before it is written to the backup media. Compressing the data usually increases backup performance and uses between 25 and 40% less space on the media. For best performance, do not select this option if the backup device provides its own hardware data compression. Compressing data with the software uses considerably more CPU cycles to process the data.

User description

Default=(Blank/None). Enter up to 60 characters of descriptive information to add to the volume label on the backup. Do not use single (') or double (") quotation marks in the description.

User description information file

Use this option to specify a file name that contains the user description for this backup. This is useful when your description contains characters not supported by the User Description SMIT option. Also, this is useful when using ASCII SMIT or an ASCII console as they do not support the input of Double-byte characters (DBCS) or Bidirectional (Bi-Di) text.

Host read permission

Default=all hosts. By default, all hosts with access to the system on which this file is written have permission to read, or restore from this image. Press Tab to limit read permission to the original host or the server on which the file is written. This option is active only when you back up to a disk image file.

User read permission

Default=all users. By default, any user on a host with access to the system and directory on which this file is written has permission to read, or restore from, this image. Press Tab to limit the read permission to only the original user, the root user on the original host, or the server to which the file is written. This option is active only when you back up to a disk image file.

Rewind tape before starting backup?

Default=yes. Press Enter to rewind the tape before the backup begins. If you are placing multiple backup images onto a single tape, then select "no" to place this backup on the tape at the

current location. This option is displayed only when you back up to a tape device. For a system backup, tape boot information is placed on the tape at the beginning of the first backup. This information is not placed on the tape for subsequent backups.

Note: If this is the first backup to this tape, or if you have restarted the system, reinserted the tape, or changed the tape drive block size, you should select to rewind the tape. Only if you completed another backup and have not performed any of these functions will the tape be positioned correctly at the end of the previous backup image.

Forward to End of Tape Before Starting Backup
This option lets you fast forward to the end of the last SysBack backup on the tape for all backup types. Use this option when stacking multiple backups on the same tape that has been rewound or ejected. This options should also be used when the system has been restarted or the block size of the tape drive has been changed from the last backup. This eliminates having to manually position the tape before stacking a backup image.

Buffer size (In Kbytes)
Default=64. Changing this value either increases or decreases the amount of data that is written to the output device in a single I/O operation. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value. This value must be a multiple of the tape block size.

Preserve physical partition mapping?
Default=no. Selecting "yes" to this option ensures that all logical volumes will be recreated from this backup using the same physical partitions that are currently allocated to them. Unless the logical volumes were originally created using physical partition maps, it is generally recommended that they not be recreated using the same partitions, because this preserves fragmentation that develops over time as logical volumes and file systems expand.

When you recreate a volume group or logical volume or perform a system installation, you can choose whether or not to use the prior partition map. If the original physical volumes do not exist or are not large enough to contain the same partitions, the logical volumes will be recreated without using the maps.

Device name for remote volume prompt
Default=(Blank/None). Enter a TTY, LFT or PTS device name to send the volume prompt to a specified device rather than to the current SMIT screen. If you are backing up to a remote host, the device name you specify is attached to the remote host. This field is displayed only when the backup device is a tape drive or virtual device.

Examples of device names are */dev/tty0*, */dev/lft0* and */dev/pts/5*. You can determine the terminal device name by typing tty at the command line on that device.

Overwrite existing backup with same ID?

> Default=no. If the **Backup File ID** field contains a value already used for an existing system backup, change this field to "yes" by pressing Tab. Doing so indicates that you want to overwrite the previous backup with this backup. After you begin this backup, the prior disk image files are removed and cannot be recovered. This field is displayed only when you back up to a disk image file.

Exclude list file name

> Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/ .exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup.

Hostname to Backup

> The hostname of the backup system, the machine that will send its data to the data destination server.

Temporary work space directory

> Default=blank. Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

File containing a list of data to be backed up

> Default=blank. Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.
>
> This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.
>
> This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.
>
> **Note:** This use of wild cards in this list is not supported.
>
> In all other cases, use of this option is not required as the specification of non-rootvg volume groups is indicated in the field **Non-rootvg volume groups to include**.
>
> When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of one file, directory, logical volume, file system, or volume group name.
>
> **Note:** This option must also be used when you are specifying a volume group name that has:
> > - a space in the name
> > - characters in the name that are interpreted by the shell as special. For example: @, * . , $
> > - characters in the name

Specifying a volume group name with these characteristics in the **Non-rootvg volume groups to include** field will cause the process to error.

Invisible backup?

If you would like the `atime` and `mtime` values of your files to be returned to their pre-backup values once the backup is completed, set this option to "yes". The `atime` and `mtime` of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures, i.e. " rc=0 or rc=1", a process will be started automatically to reset these values immediately following the backup.

Note: The `atime` and `mtime` values are collected at the start of backup processing immediately prior to backing up the files. If the `atime` or `mtime` of a file is modified during the backup process, the original `atime` and `mtime` values stored by the backup preprocessing will be restored at the end of the backup.

Note: Invoking this option will increase the amount of time that it takes for the backup process to execute.

Eject tape at end of backup?

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

Backup Extended Attributes (AIX 5.3+) only

Specifies to backup any ACLs or named extended attributes. Without this option, the image will include only AIXC ACLs and PCLs in the archive along with the other regular file data. For files containing NFS4 ACLs, conversion to AIXC will happen during the archival by default.

Eject all write protected tapes

Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media

changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

CD/DVD Media Size

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file `SB.sysback1.hd2` needs to be split, another file called `SB.sysback1.hd2.2` would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

Media Available Space

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD number one. It is the total size left after creating the boot images, adding of the device filesets, and populating of the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size value minus 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file `SB.sysback1.hd2` needs to be split, another file called `SB.sysback1.hd2.2` would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to

backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

Format backup image on a 2gb limit?
This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Ignore invalid backup objects?
Use this option to indicate if the backup should continue when it encounters any invalid backup objects. The default is "No".

Yes
If this option selected, the process will issue a warning message and continue. Once the backup finishes, it would exit with a return code of 1.

No
If this option is selected, the process will issue an error message and terminate. Once the backup terminates, it would exit with a return code of 2.

File(s) or starting directory(s)
Default=blank. Enter the starting directory where you want the backup to begin. You can enter multiple directory names if you want to back up all of these directories in a single backup. If you want to back up the entire contents of a file system, specify the mount point for that file system (for example, **/home**). Press F4 to obtain a list of all currently mounted local file systems and use F7 to select the starting directory from the list.

Directory names must be in one of the following formats:
- /directory/filename
- /directory
- ./filename
- ./directory/filename
- ./directory

All files will be backed up relative to the root (/) directory by automatically inserting a period (.) at the beginning of each filename, if it does not already exist. Otherwise, they are backed up relative to their file system mount point.

4. After confirming the above entries, make sure the backup media is properly inserted in the drive and press Enter to begin the backup.

Note: If you are backing up to a tape drive, the tape will NOT be rewound upon completion of the backup. This enables additional backups to be performed (also without rewinding), thereby "stacking" the backups onto a single tape.

Understanding Exclude List Processing on Backup Operations

Backup processes use the following rules when processing backup exclude lists:
- If **/usr/lpp/sysback/.exclude_list** exists, the contents are processed unless another path and file name are explicitly specified.
- If you have created an exclude list file in an alternate location, specifying its path and file name with the backup command will cause the backup to process

the use the content of this file rather than the default. Even if the default **/usr/lpp/sysback/.exclude_list file** exists, it will be ignored for this iteration of the backup command.

- If you have an existing **/usr/lpp/sysback/.exclude_list** file, but would like to temporarily override it and exclude nothing, you could do this to avoid deleting the default exclude list:

```
root@lasher> touch /tmp/empty.excl
root@lasher> sysback -f /dev/rmt0 -E /tmp/empty.excl
```

This would cause the backup command to process the contents of the empty file thereby excluding nothing.

Using SysBack with Fire Walls

SysBack currently opens the following ports by default on each side of a remote communication with another system:

- 1239
- 1023 for standard out
- 1022 for standard error

If ports 1023 and 1022 are not available, SysBack will decrement this number until it reaches a port not already in use. However, SysBack will not use a port number less than 512.At this time, there is no way to specify which ports SysBack will utilize and any SysBack remote services between systems separated by a firewall will require that the needed ports be opened. You must configure the firewall to open up the ports that the server and clients need. Because fire walls differ in how you open the ports, you must follow the instructions that accompanied the firewall software or hardware that you are using. If you need help with opening ports, please contact the supplier of your firewall.

Additionally, SysBack requires that reverse name resolution be the same on both sides of the firewall. For this example, assume that System B has a hostname of `fruit` and an IP address of `9.19.125.19`

If you were logged on to System A and issue the commands:

```
root:systemA> host apple
apple is 9.19.125.19
root:systemA> host 9.19.125.19
apple.dfw.ibm.com is 9.19.125.19
```

SysBack will consider `apple` and `apple.dfw.ibm.com` as two different hosts.

Backup Return Code Processing

When non-fatal errors are returned from the underlying backup command but still allow SysBack to continue, SysBack will exit with a return code 1, or `WARNING`. The non-fatal errors could vary depending on the operating environment since the condition is usually predicated upon problems in AIX or from AIX commands. Therefore, during the backup you might see an error like: `0511-089 unable to open file xxxx out of memory`

or other errors like:

`File /somepath/somefile can not be found.`

The later is often seen in environments that have ever changing temp file generation. The AIX command **/usr/sbin/backup** continues on even when these conditions occur. These are considered soft errors because they don't impact the overall backup process.

When an error occurs that is unrecoverable, or threatens the completion of the over all backup process, SysBack will exit with a return code 2, or ERROR.

Backups that have no warnings or errors will exit with a return code 0, or SUCCESS.

Therefore, the sysback, mkvgback, mkjfsback, mklvback, mkdirback, mksbcd, sblvmback, and sbsnapshot commands have three possible return codes:

- 0 Success
- 1 Warning, or soft failure
- 2 Error, or hard failure

At the end of the backup process, a message like the below will be displayed indicating the overall completion status of the backup process:

```
WARNING: Volume Group backup completed with non-fatal errors
```

It is always best to save `stdout` and `stderr` from all backup operations for review when running the backup in the background. This will allow you to easily review error conditions that were encountered should you receive a WARNING or ERROR message.

One way to capture `stdout` and `stderr` is to append this string to the end of your backup command:

```
 > /tmp/backup.log 2>&1
```

By adding this string instead, you will generate a unique log name based on the date and time with each backup:> /tmp/backup.log$(date "+%m%d%H%M").log 2>&1

SysBack allows provides option to configure the automatic capture of this output. Please refer to "Logging" on page 302 for details about configuring those options.

Chapter 5. Backups to CD or DVD

You may create a full system (installation image) backup, volume group backup, file system backup , logical volume backup, or file or directory backup to a CD or DVD. The **/usr/sbin/mksbcd** command, or its respective SMIT menu, is used to initiate backups to a CD or DVD device.

You may choose to write to the device in one of two formats:
- using AIX UDF Filesystem
- ISO 9660

Requirements

SysBack's CD and DVD backup feature has additional hardware and software requirements beyond the base product requirements. They are:

Software

- SysBack requires AIX (BOS) Version AIX 5.2 or later.
- When using the ISO9660 format, the GNU software tools named `mkisofs` and `readcd` are required. When using AIX 5.2, you can acquire these tools via the `cdrecord` package available from the **AIX Toolbox for Linux**. You can access the AIX Toolbox for Linux components from: http://www-1.ibm.com/servers/aix/ products/aixos/linux/download.html. When using AIX 5.3 and later, the `mkisofs` and `readcd` tools are installed as a part of the operating system. Once these GNU Tools have been installed, you must create the following symbolic links:
  - `ln -s /usr/samples/oem_crwriters/burn_cd_gnu /usr/sbin/burn_cd`
  - `ln -s /usr/samples/oem_crwriters/mkrr_fs_gnu /usr/sbin/mkrr_fs`
- UDF type backups are only available with DVD media and when using AIX 5.2 and later.

Hardware

SysBack can utilize any CD or DVD device that is natively supported by the AIX operating system. SysBack does not support any CD or DVD device that requires its own proprietary devices drivers or software in order to operate. For a list of the devices explicitly supported and tested by AIX at your operating system level, please see the file: `/usr/lpp/bos.sysmgt/README.oem_writers` provided by the operating system.

Important Considerations

Backups to a CD or DVD device have their own caveats to consider. Such as:

Space - ISO Format

The creation of backups to CD or DVD devices requires large amounts of free space on your system. You will need to ensure that you have enough space available to perform this process before beginning. There is a flag on the **/usr/sbin/mksbcd** command that will allow the process to estimate the required amount of free space without actually creating the CD or DVD and backup image.

However, below are the guidelines to use for determining if you have enough free space on your system This process will create 3 separate file systems for this process.

- The **backup_image** is generated to a file system named by default **/mksbcd/backup_image**. The size of this file system must be equal to the size of your backup. For example: If you are backing up rootvg only, and you have a 4 GB root volume group, this file system will have to be 4 GB in size. Likewise, if you are backing up rootvg and datavg, where rootvg is 4 GB and datavg is 7 GB, this file system will have to be 11 GB in size.

- The **cd_fs** is used as a staging area to create and build boot images, additional software needed for cloning to alternate architectures, software that you choose to optionally install onto the destination system, and portions of the backup image as it is split into media sized pieces. The default file system created is **/mksbcd/cd_fs**. The size of this file system must be equal to the size of your media. For example: If you are using 4.5 GB DVD-RAM media, this file system would have to be 4.5 GB. Likewise, if you are using 9.1 GB DVD-RAM double sided media, this file system would still only be 4.5 GB as it is only equal to one side of the media since only one side of the media can be burned at a time.

- The **cd_image** file system is also called the Rockridge file system since there is where the Rockridge image (iso image) is stored while the CD or DVD burn is in progress. The image in this file system is created from the **cd_fs** contents. The default file system created is named **/mksbcd/cd_image**. This size of this file system must be equal to the size of your media. For example: If you are using 4.5 GB DVD-RAM media, this file system would have to be 4.5 GB. Likewise, if you are using 9.1 GB DVD-RAM double sided media, this file system would still only be 4.5 GB as it is only equal to one side of the media since only one side of the media can be burned at a time.

Space - UDF Format

Unlike backups using the ISO format which require 3 large disk staging areas, backups to DVD using the UDF format do not require nearly as much staging space because you can choose to write directly to the media (using the -K flag).

However, if you choose not to write directly to the media, or you are writing directly to the media but the backup image will not fit on a single DVD, there will be a disk staging area. The backup image is generated and then written to a file system. The default name of the file system is **/mksbcd/backup_image**. You may also choose to create the backup image in a file system name of your choice. The size of this file system must be equal to the size of your backup. For example: If you are backing up rootvg only, and you have a 4 GB root volume group, this file system will have to be 4 GB in size. Likewise, if you are backing up rootvg and datavg, where rootvg is 4 GB and datavg is 7 GB, this file system will have to be 11 GB in size.

Limitations

Many pSeries systems require certain levels of microcode to be installed in order to boot and install from UDF formatted DVD media. Please check your system hardware documentation and the AIX README files in /usr/lpp/bos.sysmgt if you have any questions about your machine's requirements.

Media

Any type of media (blue VS. gold, and multiple write) is supported. However, testing proves that the better the quality of the media (usually the more expensive media) yields better results with the writing, reading, and booting. Therefore, just

as with tape media, the reliability of your backups depends greatly on the quality of your media. Refer to your individual vendor's specifications for information on media suggestions and requirements.

Speed

Please be aware that data transfer rates are inherently slower on DVD and CD devices than most tape devices. Do not expect to achieve the same high speeds or performance for backups to these devices. In fact, there in nothing in SysBack's design that can be modified to increase or decrease performance. Performance impacts in this case are a result of the individual device used and other system performance issues (like paging, memory etc.). Please refer to your individual vendor's specifications to estimate approximate data transfer rates and for any media requirements. Remember that those specifications are usually quoted as the best possible and in fact be less than estimated when your in your actual environment.

Our testing shows that the use of the UDF file system format when writing to DVD media is inherently slow. In fact, UDF DVD backups are considerably slower than a backup of the same data, on the same system, under the same conditions while writing in the ISO format. This is not something that SysBack can control or influence. Please consider the trade off between speed and the staging area space needed when making a choice between UDF formatted backups and ISO formatted backups.

Initiating the Backup

Backing up to a CD or DVD device is different than traditional SysBack backups because they are executed via their own backup command **/usr/sbin/mksbcd**. This command has numerous options to customize it to the needs of your environment. You the following backup types may be written to a CD or DVD device: Full System (Installation Image), Volume Group, File System, Logical Volume, and File or Directory level backups. Therefore, you may opt to use the SysBack SMIT Menu **Create a Backup to CD/DVD** instead of using the command line options. If you would like to create your CD or DVD backup using the SMIT Menus, you would access the following progression of menus:

root@lasher> smitty sysback

Backup & Recovery Options –> Backup Options –> Create a Backup to CD/DVD

All of the SysBack backup options that are available to you when using tape or network backups are still available to you for CD/DVD backups. For detailed explanations of options available specific to each backup type, please refer to Chapter 4, "Performing Backups," on page 19.

The command line flags that represent each option on the individual backup commands are not the same when using the **/usr/sbin/mksbcd** command. The command flags have been described in "Command Syntax and SMIT Menus" on page 74.

Just like backups to tape, SysBack can also support multi-volume backups to CD and DVD devices.

Initiating a Restore

Restoring data from a SysBack created CD or DVD is no different than restoring SysBack data stored on tape.

The same options for restoring portions of data are available:
- Non-rootvg volume group level
- File system level
- Logical volume level
- File or directory level

The **/usr/sbin/remakevg** command will read CD and DVD media backups and allow you to recreate volume groups, file systems, or logical volumes in the same manner as if the data was stored on tape or in file images. You may also use the same SMIT menu restore options as well. More information about how to restore data from a backup may be found in Chapter 12, "Recreating or Restoring from Backups," on page 151.

UDF formatted backups to DVD will have a **Backup ID** associated with each backup. This **Backup ID** functions similarly to the **Sequence Number** for tape backups. This option allows you to stack or append multiple UDF formatted backups on the same DVD media.

Boot and Installation

You may boot and install from CD/DVD just as you would with tape using SysBack. You can also boot from CD/DVD and perform a network install as well. Essentially, the CD/DVD devices may be used in any supported boot, restore, and install combination. Consider the following combinations:
- Combination 1
  - **Boot device** = CD/DVD
  - **Install Device** = CD/DVD [4]
  - **Post Install Device Support** = CD/DVD [3]
- Combination 2
  - **Boot device** = CD/DVD
  - **Install Device** = Tape
  - **Post Install Device Support** = CD/DVD [3]
- Combination 3
  - **Boot device** = CD/DVD
  - **Install Device** = Network
  - **Post Install Device Support** = CD/DVD [3]
- Combination 4
  - **Boot device** = Tape
  - **Install Device** = Tape [4]
  - **Post Install Device Support** = CD/DVD
- Combination 5
  - **Boot device** = Tape
  - **Install Device** = CD/DVD[4]
  - **Post Install Device Support** = CD/DVD
- Combination 6

- **Boot device** = Tape
  - **Install Device** = Network[1]
  - **Post Install Device Support** = CD/DVD
- Combination 7
  - **Boot device** = Network
  - **Install Device** = Network[1]
  - **Post Install Device Support** = CD/DVD
- Combination 8
  - **Boot device** = Network
  - **Install Device** = Network[1]
  - **Post Install Device Support** = NIM LPPSOURCE[2]
- Combination 9
  - **Boot device** = Network
  - **Install Device** = Tape
  - **Post Install Device Support** = CD/DVD
- Combination 10
  - **Boot device** = Network
  - **Install Device** = Tape
  - **Post Install Device Support** = NIM LPPSOURCE[2]
- Combination 11
  - **Boot device** = Network
  - **Install Device** = CD/DVD
  - **Post Install Device Support** = CD/DVD
- Combination 12
  - **Boot device** = Network
  - **Install Device** = CD/DVD
  - **Post Install Device Support** = NIM LPPSOURCE[2]

1. When creating the SysBack backup to tape, the `-N <nettype>` flag must be used in order to ensure that the network adapter can be configured to perform the network install. In SMIT, this flag equates to the **Network install support to include** field.

2. A NIM LPPSOURCE may only be a source to obtain **Post Install Device Support** filesets when a SysBack NIM Resource Network Boot is performed. This option is not available to the SysBack Classic Network Boot option.

3. The CD/DVD media used for the system boot does not have to be the same media as what contains the **Post Install Device Support** filesets. For example, you could boot from SysBack backup, and then install device support from an AIX product CD. Also, if using two different CDs or DVDs, they may be used n the same, or different, devices. For example, the boot CD/DVD may be in `/dev/cd0` and the post install fileset support media may be in `/dev/cd1`.

4. The CD/DVD media used for the system boot does not have to be the same media as what contains the backup image to be installed. For example, you could boot from one SysBack backup and install from a different SysBack backup. Also, if using two different CDs or DVDs, they may be used in the same, or different, devices. For example, the boot CD/DVD may be in `/dev/cd0` and the installation image media may be in `/dev/cd1`. Furthermore, SysBack

will prompt you to change media as appropriate when the same device is specified for the install device and the post install fileset support device. The following combinations are allowed:

a. If the:
   - install device = /dev/cd0
   - post install device support device = /dev/cd0
   - the same CD/DVD is used for the install device and the post install device support device

   a media change would not be required.

b. If the:
   - install device = /dev/cd0
   - post install device support device = /dev/cd0
   - the different a CD/DVD is used for the install device and the post install device support device use different media

   you will be prompted for a media change.

c. If the:
   - install device = /dev/cd0
   - post install device support device = /dev/cd1
   - the different a CD/DVD is used for the install device and the post install device support device use different media

   a media change is not required.

SysBack checks the media for the appropriate structure and volume number to determine if the media in the device has the **Post Install Device Support** filesets located on the media. In scenario 4.b, the media may be different simply because the install processing completed, and it is possible that you have the 3rd CD or DVD of a multivolume backup loaded. If you created the SysBack backup with the `-s package_source_dir` flag, the post install support is located on the first CD or DVD of the backup series. Hence, you will be prompted to load the 1st CD or DVD from the backup series, or an AIX product CD. The **Post Install Device Support** fileset CD or DVD can be the same CD or DVD as what contains the SysBack backup provided that you created the backup with the necessary flags on the **/usr/sbin/mksbcd** command.

Command Syntax and SMIT Menus

mksbcd <---------flags/options----------> vg1 vg2... vgN

Note: rootvg is included by default

STANDARD FLAGS:

-f "device"

Specify CD/DVD device in the form of /dev/cd0. This flag is required.

Note: The device specified with this flag can not be the same device specified when the optional `-s pkg_source_dir` is used. If the device is located on a remote host, you must also specify either the `-H` or `-h` flag.

The SMIT menu field equivalent to this flag is: Device Name.

-T C|D

Specify the device or media type. C represents CD media and D represents

DVD media. If this flag is not specified, the process will attempt to determine the type of media based on the device specified with the `-f device` flag. This flag is optional.

The SMIT menu field equivalent to this flag is: `Media Type?`.

-t I|U This flag specifies the format to use for the backup. `I` represents the ISO format. `U` represents the UDF format. There is no SMIT menu field equivalent to this flag. This option is set via a selection menu when selecting to backup to a CD or DVD device in SMIT.

-D Sets the environment variable `SBDEBUG=1` to enable debugging of SysBack programs. This flag is optional.

The SMIT menu field equivalent to this flag is: `Debug Ouptut?`.

-e Estimates the space needed. This is like the "Preview Only" option with the AIX **installp** command. This flag is optional.

The SMIT menu field equivalent to this flag is: `Estimate Space Needed?`.

-z "size"
Specify the media size in MB to override default values. Default CD size is 650 MB. Default DVD size is 4188 MB (4.09 GB). If the size of your media is double sided, specify only the size of one side of the media, not the total aggregate. This flag is optional.

The SMIT menu field equivalent to this flag is: `Media Size`.

-B Creates a Boot only CD/DVD. No backup data will be generated. This flag is optional. The SMIT menu field equivalent to this flag is: `Create a Boot only CD/DVD?`

-b Use this option to indicate which TSM client binaries to include in this backup. The default is "none". The other options available are:

   -ba This option allows you to store the contents of the **/usr/tivoli/tsm/client/api** directory. These binaries are required when using the backup as the boot media for a system installation process that will use SysBack backups stored in a TSM server.

   The SMIT menu value equivalent to this flag is: `Include TSM BA Code`.

   -bb This option allows you to store the contents of the **/usr/tivoli/tsm/client/ba** directory. These binaries are required when using the backup as the boot media for a system installation process that will use backups created by the TSM Backup/Archive client.

   The SMIT menu value equivalent to this flag is: `Include TSM BA Code`.

   -bab This option allows you to store the binaries of the TSM API client and the TSM BA client.

   The SMIT menu value equivalent to this flag is: `Include Both TSM API & TSM BA Code`.

   UDF FLAGS:

-n Using this flag will cause the **mksbcd** process to append data to an existing UDF file system (aka the DVD device). This flag will cause the DVD to be mounted in such a manner that no data on the DVD is lost. This flag is only valid with a previously UDF formatted DVD.

Note: If this flag is not used, then the **mkscbcd** backup process which effectively erases all data on the DVD.

This SMIT menu equivalent to this flag is: `Append Yes`.

-K   Use of this flag causes the **mksbcd** process to write directly to DVD (i.e. the backup is not staged to the `-M backup_image` directory) The backup images are copied directly to the UDF Filesystem provided the backup image will fit on a single DVD.

This SMIT menu equivalent to this flag is: `Backup Directly to DVD?`.

-c "termdev"
Specify this flag to indicate the name of a terminal device on which to display volume prompt messages for multi-volume backups. This may be used for local or remote backup volume prompting. Example device names:

`/dev/console (System console`

`/dev/tty0 (ASCII Terminal)`

`/dev/pts/1 (Usually a window in an AIXwindows environment.)`

This flag is optional.

The SMIT menu field equivalent to this flag is: `Device name for remote volume prompt`.

-G rs6k|rspc|chrp|all
Specify the platform type of the system where the CD/DVD will be utilized. Select one or more options. This flag is optional. If you are creating the CD/DVD on the system where it will be used to boot and install, it is not necessary to specify this flag as the process will default to the current platform type. For example: If you were creating this CD/DVD on an F50, it would be created to support the **CHRP** platform. If you are creating the CD/DVD to support this system and a second type of system, such as the default **CHRP** and also for an **RSPC** system, you would specify `-G "chrp rspc"` . This option requires that all of the device and kernel support required to boot both platforms be installed onto the system creating the CD/DVD. Failure to have all of the needed support installed will not cause the backup or CD/DVD creation to fail. Instead, it will cause the boot to fail when booting from a platform different than where the CD/DVD was created. Optionally adding the `-s pkg_source_dir` along with this `-G` combination will allow you to place this device support for both platforms into the CD/DVD image in order to be utilized as **Post Install Device Support**. This would be useful when you want to boot from a CD/DVD which has all needed device support, but install from a backup (tape, CD, DVD, file) that does not have all of the needed support in the backup image. Selecting `-G all` creates a CD/DVD that may be used to boot any system and requires the use of the `-s "pkg_source_dir` flag which provides all device support to be built into the boot images allowing this to be true.

Notes:

1. Specifying this option will perform an `installp` command against the `pkg_source_dir` and installs those file sets onto this system. Also, this support is placed onto to the CD/DVD.

2. UDF formatted DVD backups are only supported on AIX 5.2 and later systems. AIX 5.2 is the last level of AIX to formally support the **RSPC** and **RS6K** platform types. Since the process will default to the platform

of the system being backed up, and only CHRP can use this backup type, the flag is not required when creating a UDF formatted DVD. This flag exists for the ISO formatted backups that were developed prior to the UDF support.

The SMIT menu field equivalent to this flag is: `Platform type(s) for CD/DVD boot image`

-S
Stops the **/usr/sbin/mksbcd** command before writing to media without removing the final CD image. This leaves you with a final ISO image that may be burned to CD/DVD at a later time. The `backup_image` file system and the `cd_fs` file system will be removed leaving only the `cd_image` file system with the ISO image in it. If you select this option, you will have to manually burn the image to CD/DVD using the GNU `burn_cd` function instead of using SysBack. This flag is optional.

The SMIT menu field equivalent to this flag is: `Create the CD/DVD now?`.

-r "cd_fs"
This option applies to ISO formatted backups only. Specify a previously created `cd_fs` file system that was not removed by a previous **mksbcd** process. Specifying this flag causes **mksbcd** to build a new ISO image from this file system and burn the backup image to CD/DVD. This flag is optional.

The SMIT menu field equivalent to this flag is: `Create Rockridge Image from Previous cd_fs`.

-m "backup_image"
Specify an existing `backup_image` file system that contains a single, previously created backup image. The **mksbcd** command will then use this image rather than creating a new backup image during the **mksbcd** process. Do not specify the `-M backup_image` when using this flag. The SysBack backup utilized with this flag had to have been originally backed up to a file using the **/usr/sbin/sysback** command and have used the `-2`, `-z cdsize`, and `-Z maxsize` command flags. This flag is optional.

The SMIT menu field equivalent to this flag is: `ExiSting Backup Image`.

SOFTWARE OPTIONS FLAGS:

-s "pkg_source_dir"
Specify the device or directory containing AIX device and/or kernel support file sets in the `bffcreate` format for use in either creating boot images or for use as **Post Install Device Support**. This flag is required with the `-G all` flag and optional with any other `-G` flag combination. See the `-G` flag for additional details.

The SMIT menu field equivalent to this flag is: `Location of Software Packages to copy to CD/ DVD`.

-l "package_list"
Specifies a file that contains a list of additional software packages that will be stored in the **/usr/sys/inst.images** subdirectory of the `cd_fs` file system. The `-l` flag requires the use of the `-s package_source_dir` as these packages will be copied from that file system or device. This would be useful when there are AIX file sets that you would like to have installed, but are not considered required device or kernel support. You may also store other third party software products that you would like to have installed automatically.

The SMIT menu field equivalent to this flag is: `File with list of packages to copy to CD/DVD`.

WORKSPACE FLAGS:

-M "backup_image"

> Specify the name of an existing file system to be used in place of the default **backup_image** file system. You must ensure that there is enough space in this file system as outlined in the "Space - ISO Format" on page 69 and "Space - UDF Format" on page 70. If this flag is not specified, the default **backup_image** file system created is **/mksbcd/backup_image**. If there is not enough space in this file system, the **mksbcd** command will enlarge the file system with the AIX **/usr/sbin/chfs** command to make it large enough. If the **chfs** command fails, then so will **mksbcd**. Also, this file system will not be automatically removed by the **mksbcd** command. However, it's contents will be removed unless you specify the `-R M` flag. This flag is optional.

> The SMIT menu field equivalent to this flag is: `File system to store Backup Image`.

> **Note:** The directory for the **backup_image** and **cd_fs** file systems can not be the same.

-C "cd_fs"

> This option applies to ISO formatted backups only. Specify the name of an existing file system to be used in place of the default **cd_fs** file system. You must ensure that there is enough space in this file system as outlined in the "Space - ISO Format" on page 69 and "Space - UDF Format" on page 70 sections. If this flag is not specified, the default **cd_fs** file system created is **/mksbcd/cd_fs**. If there is not enough space in this file system, the **mksbcd** command will enlarge the file system with the AIX **/usr/sbin/chfs** command to make it large enough. If the **chfs** command fails, then so will **mksbc**d. Also, this file system will not be automatically removed by the **mksbcd** command. However, it's contents will be removed unless you specify the `-R C` flag. This flag is optional.

> The SMIT menu field equivalent to this flag is: `File system to store CD/DVD file structure`.

> **Note:** The directory for the **backup_image** and **cd_fs** file systems can not be the same.

-I "cd_image"

> This option applies to ISO formatted backups only. Specify the name of an existing file system to be used in place of the default **cd_image** file system. You must ensure that there is enough space in this file system as outlined in the "Space - ISO Format" on page 69 and "Space - UDF Format" on page 70 sections. If this flag is not specified, the default **cd_image** file system created is **/mksbcd/cd_image**. If there is not enough space in this file system, the **mksbcd** command will enlarge the file system with the AIX **/usr/sbin/chfs** command to make it large enough. If the **chfs** command fails, then so will **mksbcd**. Also, this file system will not be automatically removed by the **mksbcd** command. However, it's contents will be removed unless you specify the `-R I` flag. This flag is optional.

> The SMIT menu field equivalent to this flag is: `File system to store final CD/DVD image`.

-R CMI

Specify this flag when you do not want the **mksbcd** process to remove one or more of the file systems created by default. Specify one or more of the following combinations:

C   Do not remove the `cd_fs` file system

M   Do not remove the `backup_image` file system

I   Do not remove the `cd_image` file system

This can be specified as `-R CMI` or `-R "C M I"`. This flag is optional.

The SMIT menu field equivalent to this flag is: `Do not remove the final CD images`.

-V "vgname"

Specify this flag when you do not want the default `backup_image`, `cd_fs`, and `cd_image` file systems created in the rootvg volume group. This only applies to locally created file systems. This flag is optional.

The SMIT menu field equivalent to this flag is: `Local Volume Group for creation of file systems`.

-F "vgname"

Specify this flag when you do not want the default `backup_image`, `cd_fs`, and `cd_image` file systems created in the rootvg volume group. This applies to creating these file systems on a remote system and would only be specified in conjunction with the `-H host` or `-h host` flags. This flag is optional.

The SMIT menu field equivalent to this flag is: `Remote Volume Group for creation of file systems`.

HOST OPTIONS:

-h "hostname"

Specify this option when performing backups to a remote CD/DVD device. This will create the `backup_image`, `cd_fs`, and `cd_image` file systems on the local system and the `cd_image` file system on the remote system. You may optionally use the `-F vgname` flag to specify which volume group on the remote system in which to create the `cd_image` file system.

The SMIT menu field equivalent to this flag is: `Build Temp Work Space(s) on`.

-H ″hostname″

Specify this option when performing backups to a remote CD/DVD device. This will create the `backup_image`, `cd_fs`, and `cd_image` file systems on the remote system. You may optionally use the `-F vgname` flag to specify which volume group on the remote system in which to create the 3 file systems.

The SMIT menu field equivalent to this flag is: `Hostname of CD/DVD Server`.

PULL BACKUP FLAGS:

-U "hostname"

The hostname of the data destination system on which the selected backup device or file exists. You may edit this field as necessary to specify a the hostname of a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

The SMIT menu field equivalent to this flag is: `Backup Data Hostname`.

BACKUP COMMAND FLAGS:

-i "ID" A backup file ID is used to create a unique file name when writing a backup to a disk file during the `mksbcd` processing. The default ID contains the current date and time. You may change this field to any value you desire to describe the backup. If you choose an ID that is already in use in the specified directory, you must also choose to **Overwrite existing backup with same ID**, the **-O** flag, or the backup will fail. .

The SMIT menu field equivalent to this flag is: `Backup file ID`.

-O If the specified value for the **Backup file ID** is already used to name a backup in the specified directory, you must use this flag to allow the prior backup to be overwritten. Otherwise, you must choose another unique value in order for the backup to continue. This flag is optional.

The SMIT menu field equivalent to this flag is: `Overwrite existing backup with same ID?`.

-A This flag may be used instead of using both the **Backup File ID** and the **Overwrite existing backup with same ID** options in order to generate a dynamically created backup file id based on the date and time of command execution. This option takes precedence over the **Backup File ID** and **Overwrite existing backup with same ID** options and is particularly useful when scheduling this command in a backup script. This flag is optional.

The SMIT menu field equivalent to this flag is: `Dynamically CreatedBackup File ID`.

-d "description"
You may enter up to 60 characters in this field. This information does not affect the backup, but is written to the backup volume label and will appear when the volume label is read. You may not use the single quote character (') in this flag. Doing so will result in a syntax error when the backup command is executed. This flag is optional.

The SMIT menu field equivalent to this flag is: `User Description`.

-E "exlcude_list"
Enter the fully qualified path and file name to represent the exclude list. Specifying a file name without specifying the path name will cause SysBack to look for the exclude list file in the directory **/usr/lpp/sysback**. Leaving this field blank will cause the product to default to **/usr/lpp/sysback/.exclude_list**. This flag is optional.

The SMIT menu field equivalent to this flag is: `Exclude List File Name`.

-g "vginfo_file"
Specify the name of a previously created LVM information file customized for this backup. See the **/usr/sbin/mkvginfo** command in Appendix A, "Commands," on page 351 for more information about customized LVM information files. This flag is optional.

There is no SMIT menu field equivalent to this flag. It is a command line only option

-J When logical volumes are recreated from a backup, you may choose to create them using the exact same physical partitions of the disks on which they currently reside. When installing onto a disk of a different size or

physical location on the system, this is not possible. Specifying this option will preserve the current mapping of the logical volume, but will also preserve any fragmentation that currently exists. Preserving the partition mapping is generally not useful unless the logical volumes were originally created using partition maps. This flag is optional.

The SMIT menu field equivalent to this flag is: `Preserve physical partition mapping?`.

-k "buffer_size"

The buffer size indicates the amount of data that is written to the output device in a single output operation. Using a buffer size that best optimizes a particular device can have significant performance advantages.

> **Note:** The larger the buffer size, the more memory will be used by the system during the backup.

The SMIT menu field equivalent to this flag is: `Buffer size (in Kbytes)`.

-p

Specifying this option will cause the data to be compressed by the system prior to writing to the backup device. You should not compress data if the device you are writing to has built-in compression capability. However, if you are writing the backup to a remote host and wish to send less data over the network, this option may be useful. However, verify that the output device does not also have compression set. Compressing data will use considerable CPU processing on this system, but will usually result in less data being written to the backup device and usually better backup performance. This flag is optional.

The SMIT menu field equivalent to this flag is: `Compress data before writing to media?`.

-P

Use this option to create a SysBack Power Backup. A Power Backup backs up all file system data as if the file system was a raw logical volume. In many cases, this will provide better performance during the backup and during system installation from this backup. However, there are some limitations on related to customizing the installation. It is not possible to restore select files or directories from this type of backup. This flag is optional.

> **Note:** Logical volumes are backed up in their entirety, even if the file systems are only partially full. Therefore, in this scenario, using this option could actually decrease the backup and restore performance.

The SMIT menu field equivalent to this flag is: `Create a Power Backup?`.

-Z {d l}

Use these options to control the amount of LVM data which is collected during backup. When recovering a system in which all of the volume group, logical volume, file system and physical disk information is stored, the preprocessing required to read and to display the installation options can be time consuming. When the system being recovered is a different system from which the backup was created, the preprocessing can take even longer. If you are only recovering part of the system, you may want to limit the amount of disk preprocessing required for you specific recovery scenario. There are 3 options related to the collection of disk and LVM information:

Flag Not Specified

This is default option. All of the active volume group, logical volume, file

system, and physical disk information will be included in the backup regardless of whether or not the volume group has been specified for backup.

Example: The system has 3 active volume groups named, rootvg, sbvg, and datavg. When performing the backup, you only specify to include the rootvg volume group. With the "No" option set, all of the LVM and disk structure information will be collected for all three volume groups.

-Zd   This option works just as the default option except that disk information will not be collected for any disk that is not associated with an active volume group. As with the default option, this information is collected for all volume groups regardless of whether or not the volume group has been specified for backup.

Example: If the "lspv" command shows the following output:

hdisk0 000ac63cb85d28d4 rootvg active

hdisk1 000ac63cea9291ab sbvg active

hdisk2 000ac63cea9291ac none active

the hdisk0 and hdisk1 disk information would be included in the back but the information for hdisk2 would not.

-zl   This option works just as the default option except that it applies only to volume groups that have been specified for backup.

Example: The system has 3 active volume groups named, rootvg, sbvg, and datavg. If you specified only the rootvg volume group for backup:
- all of the LVM and disk structure information for rootvg will be backed up
- none of the LVM and disk structure information sbvg and datavg will be backed up

The SMIT menu field equivalent to this flag is: `Limit Logical Volume and Disk Information`.

-u   Specifies to backup any ACLs or named extended attributes. Without this option, the image will include only `AIXC`, `ACLs`, and `PCLs` in the archive along with the other regular file data. For files containing `NFS4 ACLs`, conversion to `AIXC` will happen during the archival by default.

The SMIT menu field equivalent to this flag is: `Backup Extended Attributes (AIX 5.3 Only)`.

-q   Use this flag to indicate if the backup should continue when it encounters any invalid backup objects. If this flag is specified, the process will issue a warning message and continue. Once the backup finishes, it would exit with a return code of 1. If this option is not specified, the process will issue an error message and terminate when an invalid backup object is encountered. Once the backup terminates, it would exit with a return code of 2.

The SMIT menu field equivalent to this flag is: `Ignore Invalid Backup Objects`.

-v   Use this flag to display a list of files as they are being backed up. This flag is optional.

The SMIT menu field equivalent to this flag is: `Report Output Type`.

-x   Use this flag to display a progress indicator which shows the estimated total and elapsed time of the backup process. This flag is optional.

The SMIT menu field equivalent to this flag is: `Report output type`.

-X   Use this flag to exclude user data logical volumes. System logical volumes such as `boot`, `paging`, and `jfs logs` will not be affected by this flag.

> **Note:** If a logical volume name exists in the SysBack exclude list, it will not be included in the backup regardless of whether or not this flag is set. This flag is optional.

The SMIT menu field equivalent to this flag is: `Include non-JFS logical volumes?`.

-L "filename"
Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

In all other cases, use of this option is not required as the specification of non-rootvg volume groups is indicated in the field **Non-rootvg volume groups to include**.

The SMIT menu field equivalent to this flag is: `File containing a list of data to be backed up`.

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of one file, directory, logical volume, file system, or volume group name.

-w "temporary_workspace_directory"
Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default workspace location is **/tmp**.

The SMIT menu field equivalent to this flag is: `Temporary workspace directory`.

-Y   If you would like the atime and mtime values of your files to be returned to their pre-backup values once the backup is completed, specify this option. The atime and mtime of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures, for example: " rc=0 or rc=1", a process will automatically be started to reset these values immediately following the backup.

> **Note:** The atime and mtime values are collected at the start of backup processing immediately prior to backing up the files. If the atime or mtime of a file is modified during the backup process, the original atime and mtime values stored by the backup preprocessing will be restored at the end of the backup.

> **Note:** Invoking this option will increase the amount of time that it takes for the backup process to execute.

The SMIT menu field equivalent to this flag is: `Invisible Backup?`.

COMMAND EXAMPLES:

1. To generate a boot only DVD (with no backup data) to the /dev/cd1 device, issue the command:

   ```
   mksbcd -B -T "D" -f /dev/cd1
   ```

2. To generate a backup of the rootvg volume group to DVD using the device /dev/cd1, issue the command:

   ```
   mksbcd -T "D" -f /dev/cd1
   ```

3. To generate a backup of the rootvg and datavg volume groups to a 5.2 GB (2.6 each side) DVD using the device /dev/cd0, issue the command:

   ```
   mksbcd -T "D" -f /dev/cd0 -Z 2662 datavg
   ```

4. To generate a compressed rootvg backup to CD using /dev/cd0, and is bootable by all platform types, and where the AIX product cd will act as the package source media and is loaded into /dev/cd1, issue the command:

   ```
   mksbcd -T "C" -f /dev/cd0 -G all -s /dev/cd1
   ```

5. To generate a remote backup, including datavg, to the DVD device on sysback1, and create all of the work space file systems on that remote host in workvg, issue the command:

   ```
   mksbcd -T "D -f /dev/cd0 -H sysback1 -F workvg datavg
   ```

6. To generate a backup of the rootvg volume group to DVD using the device /dev/cd1, and to create the default work space file systems in datavg instead of in rootvg, issue the command:

   ```
   mksbcd -T "D" -f /dev/cd1 -F datavg
   ```

7. To generate a backup of the rootvg and datavg volume groups to a 5.2 GB (2.6 each side) DVD using the device /dev/cd0, issue the command:

   ```
   mksbcd -TD -tU -f /dev/cd0 -Z 2662 datavg
   ```

Chapter 6. Offline Mirror Backups

Offline Mirror Backup allows you to split AIX mirrors. This allows user and system access to one mirror copy while SysBack accesses the inactive copy for backup operations. With the Offline Mirror Backup feature you can:

- Specify which mirror to split when there is more than one copy
- Specify the work directory for temporary work files
- Specify a **Pre-offline** user defined script which could be used to temporarily quiesce mirrors before they are split. For example, this may be used to temporarily halt a database before splitting mirrors in order to ensure data integrity of the data backed up.
- Specify a user backup script, called a **Backup Command File** which is used to execute the backup. You may also use this script to perform other actions like restarting a database that was halted before the mirrors were split.
- Specify a **Post-offline** user defined script which could be used to perform application tasks or other tasks as desired.
- Perform a **Preview** Offline Mirror Backup that will detect problems that would prohibit mirrors from being split without actually starting the backup.
- List the items to be split at the volume group or the logical volume level
- Perform automated recovery or manual recovery for an interrupted Offline Backup attempt.

Restrictions

Below is the list of restrictions to the SysBack Offline Mirror backup process:

- The Offline Mirror backup process can not backup data in JFS2 file systems at this time due to an AIX limitation with the **/usr/sbin/chfs** command. Once support for JFS2 has been added, SysBack will consider making the necessary updates to support JFS2 at that time.
- When backing up data in file systems, unlike previous versions of the Offline Mirror backup feature, the file systems must be mounted in order for the mirrors to be split.
- There may not be any stale partitions in a logical volume specified to be split. This must be rectified before attempting to split the logical volume. Using the `Preview` option on the Offline Mirror backup process is a simple way to identify stale partitions. Then, you may use native AIX command **/usr/sbin/syncvg** command or the SysBack SMIT Menu `Resynchronize Stale Partitions for a Volume Group`.

Performing an Offline Mirror Backup

The Offline Mirror Backup process is comprised of two pieces. This first piece is the Offline Mirror process which:

- Splits the AIX mirrors
- Calls the **Backup Command File**
- Re synchronizes the AIX mirrors after completion of the Backup Command File.

The second piece of the Offline Mirror Backup is the actual data backup process which is used to execute the backup. You may also use this script to perform other actions like restarting a database that was halted before the mirrors were split.

Note: It is not necessary to halt your database for the mirror re synchronization process at the end of the Offline Mirror Backup. However, it is still highly recommended that you halt your database while the mirrors are being split and the data backup begins.

The SysBack backup commands in the Backup Command File can backup data that is mirrored and data that is not mirrored. For example: If you specify to split all of the mirrors in `datavg` during the Offline Mirror Backup process, you may also include `rootvg` and `appvg` in the same backup process even if they are not mirrored. For example: The SysBack backup command used in the Backup Command File will take the appropriate actions to backup the split mirrors in `datavg` as appropriate, and backup the default (aka non-split) resources of `rootvg` and `appvg`.

Note: The boot logical volumes and paging spaces do not have to be mirrored in order for the Offline Mirror Backup to process successfully. In most cases, it is not advisable to mirror them. The SysBack Offline Mirror Backup process will not attempt to split their mirrors. However, if you have specified a JFSLOG to be split and backed up, the JFSLOG must be mirrored.

To initiate an Offline Mirror backup:

1. Log in as the root user.
2. Type **smitty sysback** and press Enter.
3. Select **Offline Mirror Backup Options** and press Enter.

   The following menu will display:

```
                        Offline Mirror Backup Options

Move cursor to desired item and press Enter.


  Maintain Backup Command Files
  Perform an Offline Mirror Backup
  Maintainance Utilities




F1=Help            F2=Refresh          F3=Cancel           F8=Image
F9=Shell           F10=Exit            Enter=Do
```
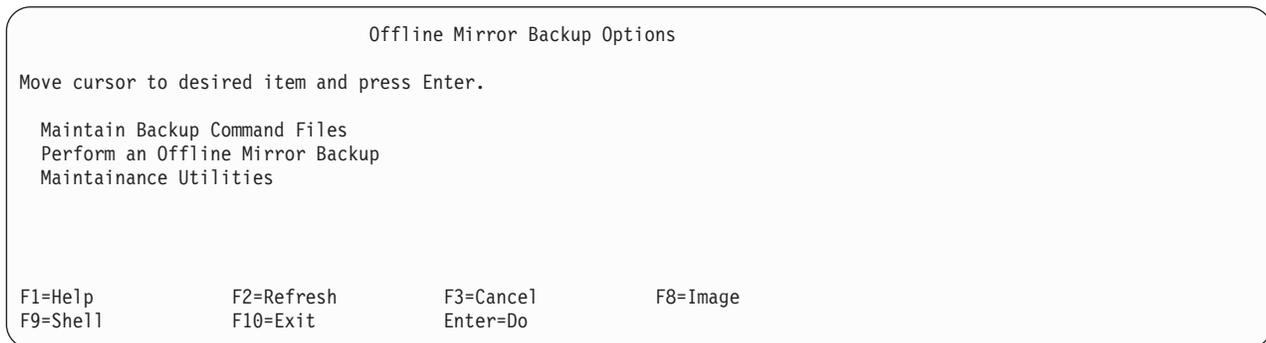
Figure 27. The Offline Mirror Backup Options Menu

4. Select **Perform an Offline Mirror Backup** and press Enter.
5. If there are predefined Backup Command File scripts, select the script to use for the backup on the Device Selector screen. However, if there are no predefined Backup Command Files, choose the option (`none`) at the Device Selector screen and press Enter.

   The following screen is displayed:

```
                    Perform an Offline Mirror Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.
                                                [Entry Fields]
  Preview Only?                                 no
  BACKUP COMMAND SCRIPTS
  Pre-offline Script                            []                      /
  Backup Command Script                         []                    +/
  Post-offline Script                           []                    +/
  Mirror Copy                                   2                      +
  Force Continue on Errors?                     no                     +
  Verbose?                                      yes                    +
  Sleep (seconds) between each mirror separation []               +
  Logical Volume List                           []                     +
  Volume Group List                             []                     +


F1=Help          F2=Refresh       F3=Cancel        F4=List
F5=Reset         F6=Command       F7=Edit          F8=Image
F9=Shell         F10=Exit         Enter=Do
```

Figure 28. The Perform an Offline Mirror Backup Menu

6. After making the desired selections, press Enter. The Offline Mirror process will begin by splitting the specified AIX mirrors. Once all of the mirrors are split, the process will stop and leave you at a shell prompt. You will enter your backup command at this shell prompt.

   Note: If you chose to specify a Backup Command File instead, that script will be executed rather than a command prompt appearing.

7. Once the backup command completes, you will be returned to the shell prompt.

8. Type the `exit` command to exit the shell. The Offline Mirror process will then begin to re synchronized the stale mirror partitions.

   Note: If you had specified a Backup Command File script, once the script exits, the Offline Mirror process will automatically continue with the mirror re synchronization.

The high level process flow for an Offline Mirror Backup is as follows:

- Checks AIX mirror rules for each logical volume specified to be taken offline.
- Checks to make sure that each file system is mounted for each logical volume specified for the mirror split.

   Note: This check does not apply to raw logical volumes.

- Checks to make sure that the jfslog is mirrored for each file system being taken offline.
- Checks to ensure that no JFS2 file systems have been specified.

   Note: JFS2 file systems are not supported for the offline mirror backup process. However, they may be included in the actual backup command executed at either a shell prompt or by a Backup Command File

- Checks to ensure that all specified logical volumes are actually mirrored.
- Checks to ensure that there are no stale physical partitions.

   Note: If stale partitions are found, the offline mirror process will issue a warning message and the logical volume containing stale partitions will not be split. The backup process will continue. Use the **/usr/sbin/syncvg**

command to re synchronize the stale partitions. Alternatively, you may use the SysBack SMIT fast path **smitty sbom_syncvg** to perform this action.

- Display a list of all of the warning and error messages for all logical volumes that failed the above checks.

  Note: Logical volumes of type `boot`, `sysdump` or `paging` are not taken offline. These are not considered errors, but will issue a warning if specified.

- Display a list of all logical volumes that passed the offline mirror rules
- If you did not use the `Force to Continue on Errors` option and there were errors reported, the Offline Mirror process would terminate at this point.
- If you specified a Pre-Offline script, it would be run at this point.
- Specified raw logical volumes are taken offline and split using the **/usr/sbin/chlvcopy** command.
- Specified file systems and their respective logical volumes are split using the **/usr/sbin/chfs** command. They are split in alphabetical order by mount point. This creates a temporary mount point called **/sbom/your_filesystem**.
- If you specified a Backup Command File, then it would be run at this point. If you did not, you will be placed at a command prompt where you may issue your backup command.
- The backup process runs.
- Once the Backup Command File script exits, or the command prompt is exited, the Offline Mirror process will begin to re synchronized the mirrors.
- The split logical volumes are re synchronized.
- The temporary split file system mount points are unmounted and removed in reverse alphabetical order by mount point. This causes the underlying logical volumes to be automatically re synchronized.
- All temporary work and status files are removed.

Maintaining Backup Command Files

SysBack provides a SMIT menu interface to assist you with creating your Backup Command Files. These files are simply backup scripts. The SMIT menu interface for maintaining these scripts looks like the SMIT menus for each of the five backup commands. Therefore, you do not have to know the exact SysBack backup command syntax in order to create a script. However, for those who are experienced with creating scripts, there is also an interface to create a generic script. In any backup script that you create, you may included any number of operations to prepare for the backup. You are not limited to SysBack command usage in the Backup Command Files. Also, you may create your scripts with the text editor of your choice instead of using the SysBack SMIT menu interface.

To create a Backup Command File using the SysBack SMIT menu interface:

1. Log in as the root user.
2. Type **smitty sysback** and press Enter.
3. Select **Offline Mirror Backup Options** and press Enter.

   The following menu will display:

```
                        Offline Mirror Backup Options

Move cursor to desired item and press Enter.


  Maintain Backup Command Files
  Perform an Offline Mirror Backup
  Maintainance Utilities




  F1=Help              F2=Refresh          F3=Cancel          F8=Image
  F9=Shell             F10=Exit            Enter=Do
```
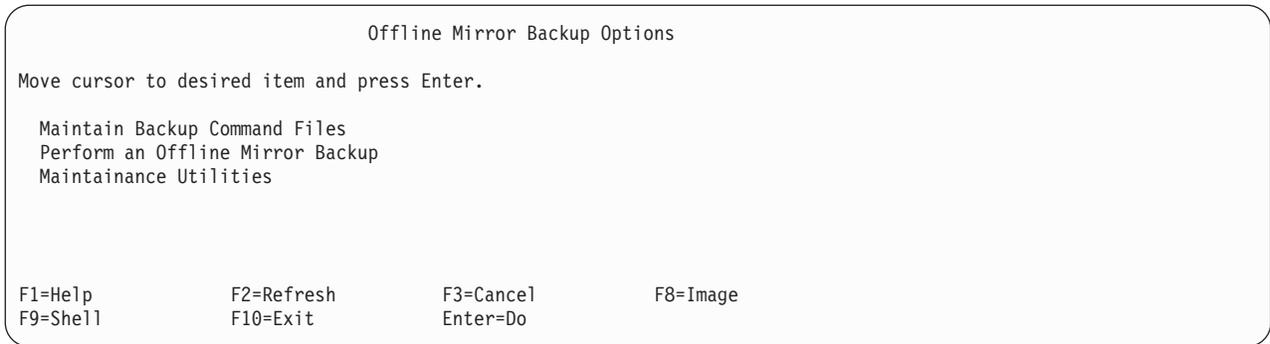
Figure 29. The Offline Mirror Backup Options Menu

4. Select **Maintain Backup Command Files** and press Enter.

   The following menu will display:

```
                        Maintain Backup Command Files

Move cursor to desired item and press Enter.


  Create a Backup Command File
  Change a Backup Command File
  Remove a Backup Command File




  F1=Help              F2=Refresh          F3=Cancel          F8=Image
  F9=Shell             F10=Exit            Enter=Do
```

Figure 30. The Maintain Backup Command Files Menu

5. Select **Create a Backup Command File** and press Enter.

   The following screen will display:

```
                        Create a Backup Command File

Move cursor to desired item and press Enter.


  Create a Generic Backup Command File
  Create a command file to: Backup the System
  Create a command file to: Backup a Volume Group
  Create a command file to: Backup a Filesystem
  Create a command file to: Backup a Logical Volume
  Create a command file to: Backup Files or Directories




  F1=Help              F2=Refresh          F3=Cancel          F8=Image
  F9=Shell             F10=Exit            Enter=Do
```
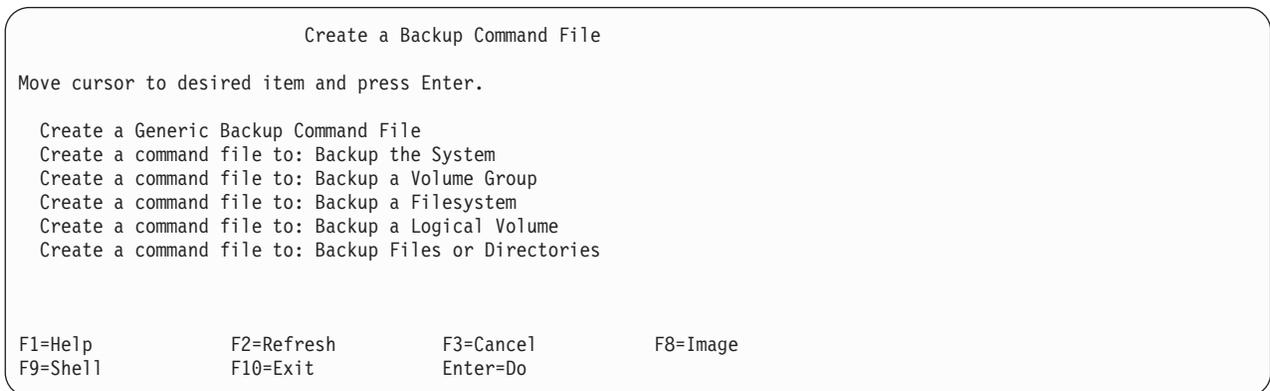
Figure 31. The Create a Backup Command File Menu

6. Select **Create a command file to: Backup the System** and press Enter.

   The following screen will be displayed:

```
                      Create a command file to: Backup the System

  Type or select values in entry fields.
  Press Enter AFTER making all desired changes.

  [TOP]
Backup Command File Name                    [sbom_backup]
File Description                            [System Backup]
--------------command options------------   sysback
Backup Data hostname                        [[
Device Name                                 [/dev/rmt0]
Create a Power Backup?                      No
Report output type                          File List
Platform/kernel type for tape boot image    rspc/MP
Network install support to include
Compress data before writing to media?      No
User Description                            []
Buffer size (in Kbytes)                     [64]
Preserve Physical partition mapping?        No
Device name for remote volume prompt        []
[ MORE }


F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 32. The Create a System Backup Script Menu

7. Input the desired values for each field and press Enter.

Scripts created using the SysBack SMIT menu interface will be located in the
/usr/lpp/sysback directory unless you provide an alternate, fully qualified path.
Below is an example of a Full System backup script created using the SMIT menu
interface:

```
#!/bin/ksh  # Command filename: /usr/lpp/sysback/sbom/sbom_sys #
Description:  System Backup sysback -R /sbom -h "remote.host.ibm.com" -f
"/backups/my_host" -I "031803" -i -p -0 exit $?
```

Maintenance Utilities

SysBack provides options to assist you with the synchronization of stale partitions
that are prohibiting a backup from running and to recover from a failed Offline
Mirror backup.

Synchronizing Stale Partitions

SysBack looks for stale partitions for any device whose mirror is specified to be
split for backup processing. The AIX mirrors can not be split while stale partitions
exist. If the Offline Mirror backup process detects stale partitions, it will display a
warning message indicating that this condition was encountered and will not split
that logical volume's mirror.

You may attempt to re synchronize stale partitions with the **/usr/sbin/syncvg**
command. However, SysBack also provides a SMIT menu interface to assist you
with the execution of this command.

To synchronize stale partitions in a volume group:
1. Log in as the root user.
2. Type **smitty sysback** and press Enter.
3. Select **Offline Mirror Backup Options** and press Enter.

The following menu will display:

```
                    Offline Mirror Backup Options

Move cursor to desired item and press Enter.

  Maintain Backup Command Files
  Perform an Offline Mirror Backup
  Maintainance Utilities



F1=Help              F2=Refresh         F3=Cancel         F8=Image
F9=Shell             F10=Exit           Enter=Do
```

Figure 33. The Offline Mirror Backup Options Menu

4. Select **Maintenance Utilities** and press Enter.

The following menu will display:

```
                       Maintainance Utilities

Move cursor to desired item and press Enter.

  Recover from System Failure during an Offline Mirror Backup
  Synchronize Stale Partitions for a Volume Group



F1=Help              F2=Refresh         F3=Cancel         F8=Image
F9=Shell             F10=Exit           Enter=Do
```

Figure 34. The Maintenance Utilities Menu

5. Select **Synchronize Stale Partitions for a Volume Group** and press Enter.

The following menu will display:

```
             Synchronize Stale Partitions for a Volume Group

Type or select values in entry fields.
Press Enter AFTER making all desired changes.
                                              [Entry Fields]
* Volume Group Name                           []              +






F1=Help              F2=Refresh         F3=Cancel         F8=Image
F9=Shell             F10=Exit           Enter=Do
```

Figure 35. The Synchronize Stale Partitions for a Volume Group Menu

6. Enter the name of the volume group with partitions to be synchronized and press Enter.

Note: Before you initiate this process, you should fully understand the implications of running the **/usr/sbin/syncvg** command as well as any restrictions to its use. Please consult your AIX documentation or your technical support contact if you need assistance with this process.

Recover from a Failed or Aborted Offline Mirror Backup

You need to recover when the Offline Mirror Backup process is interrupted and never completes. This could occur when someone or something killed the Offline Mirror backup process before completion. For example, you experienced a system crash while the backup process was running. If you receive the message below when attempting to start a new Offline Mirror Backup process:There appears to be another sbom_backup process running!

and there are no other Offline Mirror backup processes are running, issue the command: sbom_backup -RF. You may also use the SysBack SMIT menu interface to perform the recovery.

To synchronize stale partitions in a volume group:

1. Log in as the root user.
2. Type **smitty sysback** and press Enter.
3. Select **Offline Mirror Backup Options** and press Enter.

   The following menu will display:

```
                    Offline Mirror Backup Options

Move cursor to desired item and press Enter.

  Maintain Backup Command Files
  Perform an Offline Mirror Backup
  Maintainance Utilities




F1=Help              F2=Refresh          F3=Cancel           F8=Image
F9=Shell             F10=Exit            Enter=Do
```
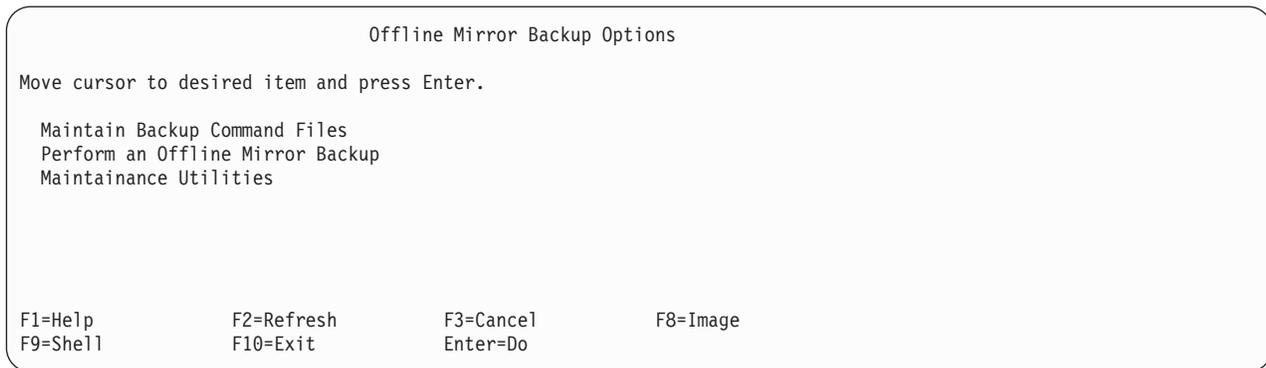
Figure 36. The Offline Mirror Backup Options Menu

4. Select **Maintenance Utilities** and press Enter.

   The following menu will display:

```
                       Maintainance Utilities

Move cursor to desired item and press Enter.

  Recover from System Failure during an Offline Mirror Backup
  Synchronize Stale Partitions for a Volume Group




F1=Help              F2=Refresh          F3=Cancel           F8=Image
F9=Shell             F10=Exit            Enter=Do
```
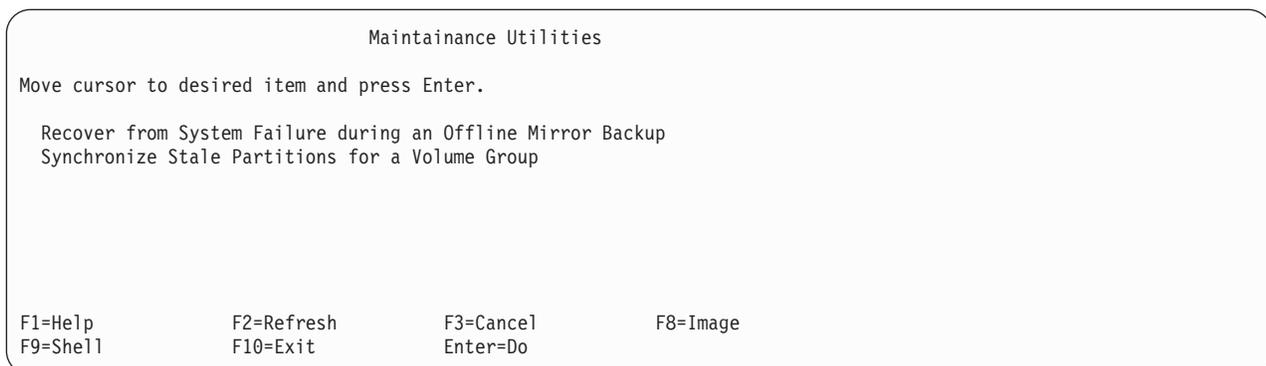
Figure 37. The Maintenance Utilities Menu

5. Select **Recover from a System Failure SysBack during an Offline Mirror Backup** and press Enter.

   The following menu will be displayed:

```
          Recover from System Failure during an Offline Mirror Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.
                                                [Entry Fields]
Force Continue on Errors?                     no                      +
Verbose?                                      yes                     +







F1=Help           F2=Refresh        F3=Cancel          F8=Image
F9=Shell          F10=Exit          Enter=Do
```
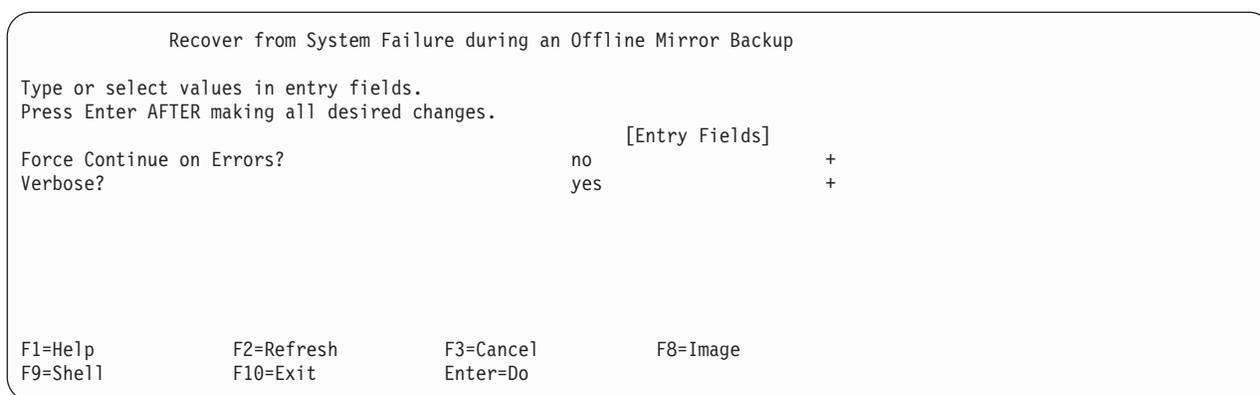
Figure 38. The Recover from System Failure during an Offline Mirror Backup Menu

---

Command Syntax

sbom_backup <------ *flags/options---------> vgname lvname

FLAGS:

-Q   Specifying this option will initiate a validation process of the specified
volume groups and logical volumes ensure that the AIX mirrors for these
resources can actually be split. This process will generate output that
includes the reasons why a specified resource may not have it's AIX mirror
split, as well as, indicating which of the specified resources did pass the
validation process. Additionally, the Offline Mirror backup process will not
execute, only validate. It is recommended that you perform this preview
operation before attempting to begin your Offline Mirror backup. This flag
is optional.

The SMIT Menu field equivalent to this flag is: Preview Only

-p scriptname
Use this option to specify the path and file name of a Pre-offline script that
should be executed before the AIX mirrors are split. This flag is optional.

The SMIT Menu field equivalent to this flag is: Pre-offline Script.

-x scriptname
Use this option to specify the path and file name of a Backup Command
File script that will be executed after the AIX mirrors are split. This is
normally used to perform the actual data backup. If no Backup Command
File was specified, you will be presented with a command prompt where
you must then manually enter your commands. This flag is optional.

The SMIT Menu field equivalent to this flag is: Backup Command Script.

-P scriptname
Use this option to specify the path and file name of a Post-offline script
that will be executed after the AIX mirrors are re synchronized. This flag is
optional.

The SMIT Menu field equivalent to this flag is: Post-offline Script.

-c 2|3 Specify the AIX mirror copy that you would like to be split off for the
Offline Mirror backup process. The supported values are 2 or 3. The
default value is 2. This flag is required.

The SMIT Menu field equivalent to this flag is: `Mirror Copy`.

-F   Use this option to indicate that you wish the Offline Mirror backup process to continue even if errors are encountered. An example of this might be that the specified Pre-offline script failed to execute. Another example might be that you specified a logical volume to be split but that the AIX mirror can not be split for some reason. Without specifying this flag, the Offline Mirror backup process would terminate. This flag is optional.

The SMIT Menu field equivalent to this flag is: `Force Continue on Error`.

-v   Use this option to display all status and progress messages during the Offline Mirror backup process. This flag is optional.

The SMIT Menu field equivalent to this flag is: `Verbose`.

-t dirname

Use this option to specify the directory name to store temporary work files created by the Offline Mirror process. If no directory is specified, the **/tmp** directory will be used. This option does not apply to the temporary work files generated from the actual SysBack backup command. This flag is optional.

The SMIT Menu field equivalent to this flag is: `Work Directory`.

-R   Use this flag to recover from an interrupted Offline Mirror backup process. It may be used in combination with the `-F` and `-v` flags only. This SMIT menu equivalent is the **Recover from System Failure during an Offline Mirror Backup** menu. Use this flag only when you receive the message `There appears to be another sbom_backup process runnning!` when attempting to initiate an Offline Mirror backup process. You will receive this message only when someone or something killed a previous Offline Mirror process. Confirm that there are in fact no other Offline Mirror processes running before utilizing this flag to cleanup and reset the aborted process.

lvname vgname

- Specify a list of logical volumes that should have their AIX mirrors split by this Offline Mirror backup process. This list is not required when specifying a list of volume groups. However, both a list of volume groups and logical volumes may be specified simultaneously. If a logical volume is included in a listed volume group do not specify it again individually. File system names may not be specified. Instead, you must specify the underlying logical name.

- Specify a list of volume groups that should have their AIX mirrors split by this Offline Mirror backup process. This list is not required when also specifying a list of logical volumes. However, both a list of volume groups and logical volumes may be specified simultaneously.

COMMAND EXAMPLES:

1. To split the mirrors in the **sbvg** volume group and use the Backup Command File named **split.vg.backup** to perform the backup, use the command:

   `sbom_backup -x split.vg.backup sbvg`

2. To split the mirrors of the volume group **sbvg**, along with the mirrors for the logical volumes **lv27** and **testlv** in **datavg**, forcing the process to continue if errors are encountered, and displaying the output to the screen, use the command:

   `sbom_backup -F -v sbvg lv27 testlv`

Note: If you do not specify a Backup Command File with the **-x** flag, you will be placed at a command prompt to allow you to input the backup commands of your choice. Once the backup commands complete, type **exit** at the command prompt to allow the Offline Mirror process to begin re synchronizing the split mirrors.

3. To recover from an interrupted Offline Mirror backup process, such as when the process was terminated inadvertently. issue this command to clean up and re synchronize mirrors:

   ```
   sbom_backup -R
   ```

Manual Recovery

If you need to recover from a failed Offline Mirror backup attempt, but the automated recovery process was unsuccessful, you will need to manually recover from the failed backup attempt.

To recover manually, you would do the following:

1. Obtain a listing of all of the active volume groups on your system using the **lsvg -o** command.
2. Obtain a listing of all of the logical volumes in each volume group using the **lsvg -l** *vgname* command.
3. Repeat step 2 for each volume group identified in step 1.

Once you have obtained the above information, we are looking to identify any logical volume matching these traits:

- Logical volume names like: `lvnameL` (capital letter *L* at the end of the logical volume name). For example: `sblvL`
- Logical volume names like: `lvnamecopy00` (the string *copy00* at the end of the logical volume name). For example: `sbfscopy00`.
- A logical volume with a state of:
  - open???????
  - closed???????
- A mount point named like: `/sbom/directory` (has a parent directory of */sbom*). For example: `/sbom/sbfs2`.
- Logical partitions (LPs), physical partitions (PPs), or physical volumes (PVs) will have values of zero.

Once you have compiled the list of all of the logical volumes and file systems that match the above criteria then perform the following to steps to re synchronize your mirrors and clean up the system.

- For any file system that had a parent directory of `/sbom`, execute the following commands:

  ```
  unmount /sbom/filesystem rmfs /sbom/filesystem
  ```

  Note: If there are multiple file systems affected, you must perform this process by unmounting them in reverse alphabetical order.

- For any affected logical volume that also had a mount point of `N/A`, run the following command:

  ```
  chlvcopy -fB  "lvname
  ```

- Repeat the above operation until all affected file systems and logical volumes are addressed.

This is an example of the output from the **lsvg -o** command.

```
# lsvg -o  rootvg  sbvg sbvg1 vg00
```

This is an example of the output from the **lsvg -l** *vgname* command.
```
# lsvg -l sbvg

LV NAME      TYPE     LPs PPs PVs LV STATE      MOUNT  POINT
loglv01      jfslog   1   3   3   open/syncd    N/A
sb1lv        jfs      10  30  3   closed/syncd  N/A
sb2lv        jfs      10  30  3   closed/syncd  N/A
lv07         jfs      3   9   3   open/stale    /sb1fs
lv05         jfs      3   9   3   open/stale    /sbfs
lv10         jfs      10  20  2   open/stale    /sbfs/data/directory
lv11         jfs      10  20  2   open/stale    /sb1fs/data/directory
sb1lvL       jfs      0   0   0   closed??????? N/A
sb2lvL       jfs      0   0   0   closed??????? N/A
lv07copy00   jfs      0   0   0   open???????   /sbom/sb1fs
lv05copy00   jfs      0   0   0   open???????   /sbom/sbfs

lv10copy00   jfs       0   0   0    open???????    /sbom/sbfs/data/directory
lv11copy00   jfs       0   0   0    open??????? /sbom/sb1fs/data/directory
```

From the above output, we see that the following file systems and logical volumes are affected and should be removed: File systems: /sbom/sb1fs /sbom/sbfs /sbom/sbfs/data/directory /sbom/sb1fs/data/directory Logical Volumes: sb1lvL sb2lvL To remove them in the correct order:
```
# unmount /sbom/sb1fs/data/directory
# unmount /sbom/sbfs/data/directory
# unmount /sbom/sb1fs
# unmount /sbom/sbfs
# rmfs /sbom/sb1fs/data/directory
# rmfs /sbom/sbfs/data/directory
# rmfs /sbom/sb1fs
# rmfs /sbom/sbfs
# chlvcopy -fB sb1lvL
# chlvcopy -fB sb2lvL
```

Chapter 7. Snapshot Backups

AIX 5.2 added functionality to create and backup snapshots of JFS2 Filesystems. SysBack provides support for this function to allow customers the ability to create a point in time backup of JFS2 file systems. Since it is not required to unmount or quiesce the file system in order to create a snapshot copy, there is very little, if any, application downtime associated with the backup process.

Purpose

The Snapshot Backup process allows you to create snapshot copies of JFS2 Filesystem and then use SysBack backup commands to backup those copies. By using this process, user and system access to the original JFS2 Filesystem is maintained while SysBack accesses the snapshot copy for backup. With the Snapshot Backup feature you can:

- Create a snapshot of all specified JFS2 Filesystems
- Specify an optional, user defined Pre-backup script to run before the snapshot copies of the JFS2 are created. Though not required, you may choose to use this script to quiesce a file system before the snapshot copies are created.
- Specify the work directory for SysBack to use for temporary work files
- Mount the JFS2 snapshot copy on a temporary mount point
- Specify a user defined backup script called the **Backup Command File**
- This script is executed once all snapshot copies have been created for the JFS2 Filesystems specified. You may also use this script to restart a quiesced application. If a backup script is not specified, you will be presented with a shell prompt to manually enter your desired backup commands.
- Specify an optional, user defined Post-snapshot script that would be executed either after the snapshot copies have been removed, or after the backup script completes, depending on the options specified.
- Perform a **Preview** of the Snapshot Backup process to ensure that the system has adequate resources available to create the snapshot copies. This option does not actually start the backup process.
- Obtain information about each snapshot copy
- Optionally remove the logical volumes created by the snapshot process
- Clean up snapshot copies after a failed backup attempt

Restrictions

Below is the list of restrictions to the SysBack Snapshot Backup feature:

- The AIX Snapshot functionality used by SysBack applies to the JFS2 Filesystem type only

Snapshot Processing

The Snapshot Backup process can be thought of as two pieces. This first piece of the process:

- Creates a snapshot copy of specified JFS2 Filesystems
- Calls the **Backup Command File** to perform a backup of the snapshot copy
- Optionally removes snapshot copies and their associated logical volumes

The second piece of the Snapshot Backup process is the actual data backup process. Though it is not necessary to halt your databases or applications for the Snapshot Backup process, it is still recommended that you halt your databases and applications while the snapshot copies are being created. This may be completed via the **Pre-backup script**. You may then use the **Backup Command File script** to restart the databases or applications just before beginning the backup of the snapshot copies.

The high level process flow for the Snapshot Backup process is as follows:
- Checks the AIX snapshot rules against each file system specified for the process
- Verifies that none of the following have been specified for processing:
    - Raw Logical Volumes
    - JFS Filesystems
    - Log devices
    - Any other non-JFS2 object
- Verifies that each JFS2 Filesystem specified for the process is mounted
- Verifies that there is enough space for the process to create all necessary snapshot logical volumes
- Displays any warning and error messages for file systems that failed the above verification steps
    - If errors were reported and you did not specify the **Force Continue on Errors** option, the snapshot process would terminate at this point in the process.
- Executes the **Pre-Backup script** if it was defined
- Creates snapshot logical volumes for all file systems that passed the validity tests
- Mounts snapshots as `/snapshot/$PID` unless a user defined mount point has been specified
- Executes the **Backup Command File** if it exists. If a **Backup Command File** does not exist, a Shell command prompt will be displayed for you to manually enter backup commands.
- Executes the backup process specified by the **Backup Command File** or command prompt
- Removes any snapshot logical volumes that were specified by the **Configuration File** option after the completion on the backup process.
    - If the **Configuration File** option is not used, all snapshot logical volumes are removed unless **Remove Snapshots?** option is set to "Yes" or .
- Execute the **Post-Backup Script** if it was defined
- Removes temporary work file and status files created by the process

Performing Snapshot Backups

To initiate the Snapshot Backup process:
1. Log in as the root user.
2. Type `smitty sysback` and press Enter.
3. Select **Snapshot Backup Options** and press Enter.

    Note: can access the same menu with the SMIT fastpath `smitty sb_snapshot`
    The following menu will display:

```
Snapshot Backup Options

Move cursor to desired item and press Enter.

  Maintain Backup Command Files
  Perform a Snapshot Backup
  Maintenance Utilities



F1=Help            F2=Refresh        F3=Cancel          F8=Image
F9=Shell           F10=Exit          Enter=Do
```
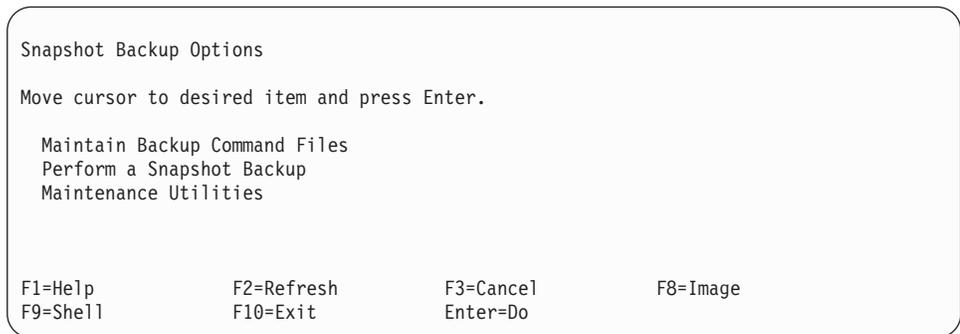
4. Select **Perform a Snapshot Backup** and press Enter
5. If there are multiple predefined **Backup Command File** scripts defined in **/usr/lpp/sysback/sbsnapshot**, you may select the script to use for the backup on the **Device Selector** screen. However, if there are not any predefined **Backup Command File** scripts or you wish to specify a script that resides in a different location, choose the (none) option at the **Device Selector** screen and press Enter.

   The following screen is displayed:

Figure 40. The Perform a Snapshot Backup Screen

```
Perform a Snapshot Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.
                                             [Entry Fields]
  Preview Only?                                no
  BACKUP COMMAND SCRIPTS
  Pre-backup Script                            []
  Backup Command Script                        []
  Post-snapshot Script                         []
  Configuration File                           []
  Size of Snapshot Logical Volume              []
  Continue on error                           no
  Verbose?                                    yes
  Remove snapshot?                            no
  Snapshot mount point                         []
  Work directory (default is /tmp)             []
  Logical volume list                          []
  Volume group list                            []



F1=Help            F2=Refresh        F3=Cancel          F4=List
F5=Reset           F6=Command        F7=Edit            F8=Image
```

The fields have the following definitions:

Preview Only?
> Use this option to perform the validation and verification steps of the snapshot process and to ensure that there are enough resources available to create the snapshot backup. Once the validation process completes, any warning and error messages are displayed and the process will terminate.

Pre-backup Script
> Use the option to specify the location and filename of a user defined script that will execute before the snapshots are created. If the full path

name of the file is not specified, the process will attempt to locate the specified filename in the **/usr/lpp/sysback/sbsnapshot** directory.

Note: The first argument passed into the pre-backup script by the SysBack processing will be the mount point used for the snapshot copy. i.e. $1

Backup Command Script

Use this option to specify the location and filename of a user defined script that will execute the backup of the snapshots created by this process. This script will execute once all of the snapshot copies have been created for the specified JFS2 Filesystems. If the full path name of the file is not specified, the process will attempt to locate the specified filename in the **/usr/lpp/sysback/sbsnapshot** directory.

Notes:

a. If this option is not specified, then you will be presented with a shell command prompt so that you can manually enter commands.

b. The first argument passed into the backup script by the SysBack processing will be the mount point used for the snapshot copy. i.e. $1

Post-snapshot Script

Use this option to specify the location and filename of a user defined script that will execute either:

- after the snapshots copies have been removed if the **Remove Snapshot? = Yes** option was specified

  or

- after the backup completes if the **Remove Snapshot? = No** option was specified

If the full path name of the file is not specified, the process will attempt to locate the specified filename in the **/usr/lpp/sysback/sbsnapshot** directory.

Note: The first argument passed into the post-backup script will be the mount point used for the snapshot copy. i.e. $1.

Configuration File

Use this option to specify the location and filename of a user defined configuration file that specifies the name and size of the new logical volume on which to create the snapshot copy. If the full path name of the file is not specified, the process will attempt to locate the specified filename in the **/usr/lpp/sysback/sbsnapshot** directory.

Note: If this option is not specified, SysBack will create the new logical volumes using default naming conventions and sizes.

Please refer to the section **Snapshot Configuration File** Format for additional information regarding the required format for this file.

Size of Snapshot Logical Volume

Use this option to specify the size value to create snapshot copy logical volume. The value specified also requires a unit of measure indicator. The allowed units of measure indicators are:

- M represents megabytes
- G represents gigabytes

- P represents a percentage of the original JFS2 Filesystem size

The default is megabytes.

For example:

To create a 128 megabyte logical volume, specify 128M.

Note: If no value is specified for this option, and the **Configuration File** field is also blank, then the snapshot logical volumes will be created to the exact size of the JFS2 Filesystem being snapshot.

Tip: Some snapshot copies will only between two and six percent of the size of the snapped file system. In the case of a highly active file system, this size estimate could easily rise to between 15 and 20 percent of the snapped file system - or more. The amount of space needed is dependant on the file system size, utilization, and activity level. You will need to ensure that the logical volumes created to store the snapshot copies are large enough to contain the complete snapshot copy. If the snapshot process runs out of space while creating the snapshot copy, the snapshot will be discarded as would any other snapshots associated with the snapped file system. This means that any snapshot copies of the specified file system created directly with the AIX snapshot utilities, separate from the SysBack processing, would be removed as well.

If this situation is encountered, you may see one of the following two error labels in the AIX Error Report:
- J2_SNAP_FULL
- J2_SNAP_EIO

Continue on Error

Use this option to define how SysBack should response to error conditions.

If Continue on Error is set to a value of Yes, the pre-backup, snapshot, backup, and post-backup processes will attempt to continue when an error occurs.

If **Continue on Error** is set to a value of "No", the process will terminate when an error is encountered.

If **Continue on Error** is set to a value of "Yes" , the process will open a ksh shell and present a command prompt when any type of fatal error is encountered. Once the problem has been resolved and you have exited the shell, the snapshot process will continue.

Verbose
Use this option to display all status and processing messages.

Remove Snapshot?
Use this option to indicate whether SysBack should remove snapshot objects after the backup process has completed.

Snapshot mount point

Use this option to specify the mount point name to use for mounting the Snapshot copy for backup. This value will be the first argument passed to the pre-backup, backup and post-backup scripts by the SysBack processing.

For example: If the file system to be snapshot is named /database, specifying /snapshot in this field would cause SysBack to mount the snapshot copy of this file system as /snapshot/database.

If this field is left blank, the default mount point will be used. The name will be in the **/sbsnapshot/$$** where $$ is a unique process ID.

Work directory (default is /tmp)
> work files created during the Snapshot Backup process. If the field is left blank, the **/tmp** directory will be used by default.

Logical volume list
> Use this option to specify a list of logical volumes associated with the JFS2 Filesystems that should be snapped for backup. This option may be used alone, in conjunction with the **Volume Group List**, or in conjunction with a **Configuration File**. However, at least one of these three options must be specified.

Volume group list
> Use this option to specify a list of volume groups that contain JFS2 Filesystems that should be snapped for backup. This option may be used alone, in conjunction with the **Logical Volume List**, or in conjunction with a **Configuration** File. However, at least one of the these three options must be specified.

6. After making the desired selections, press Enter. The Snapshot Backup process will begin by creating the snapshot copies of the specified file systems. Once all of the snapshot copies are created, the process will stop and leave you at a shell command prompt. You will enter your backup command at this shell prompt.

> **Note:** If you chose to specify a **Backup Command File**, that script will be executed rather than a shell prompt appearing.

7. Once the backup command completes, you will be returned to the shell prompt.
8. Type the exit command to exit the shell. The snapshot process will then begin the snapshot copy removal processing based on your previously defined specifications.

Snapshot Configuration File Format

The **Configuration File** option is used to specify the names and sizes to use for the creation of snapshot copies. Use of this file is optional. If a **Configuration File** is not specified, SysBack will create the snapshot copies using program defaults.

The **Configuration File** requires one line per entry, and must use the following format:

mountpt:newlvname:sizeunit:removeopt

where:

- mountpt represents the Mount Point of the JFS2 Filesystem from which the snapshot copy will be created.
- newlvname represents the Logical Volume name that SysBack should use when creating the snapshot copy.
- sizeunit represents the size that SysBack should create the Logical Volume used for the snapshot copy.

The value specified also requires a unit of measure indicator. The allowed units of measure indicators are:

– `M` represents megabytes

– `G` represents gigabytes

– `P` represents a percentage of the original JFS2 Filesystem size

The value specified also requires a unit of measure indicator. The allowed units of measure indicators are:

The default is megabytes.

For example:

To create a 128 megabyte logical volume, specify 128M.

To create a logical volume that is 50% of the size of the original logical volume, specify 50P.

If a 0 (zero) or null value is specified, the snapshot logical volume will be created at 30% of the size of the JFS2 Filesystem specified

- `removeopt` represents how SysBack should handle the removal of the logical volumes used for the snapshot copies after the backup process is finished. The acceptable values for this field are:

  – `Y` represents "Yes". This value indicates to remove the snapshot copy information and the associated logical volume.

  – `N` represents "No". This value indicates that neither the snapshot copy information nor the associated logical volume will be removed.

  – `S` represents "Save". This value indicates that SysBack should remove the snapshot copy information from the logical volume but not remove the associated logical volume.

    Note: Due to the nature of the default AIX snapshot processing, this behavior is only possible when defining specific logical volume names for SysBack to use via this **Configuration File**. Therefore, if you execute the Snapshot Backup process via the command line or via SMIT without specifying the **Configuration File** option, the only values available for processing are "Yes" and "No". The "Save" option will not be possible when using defaults.

Examples:

Example 1: Placing the entry `/database:lv15_snap:128M:S` in the Configuration File would:

- create a snapshot copy of the JFS2 Filesystem named `/database`
- store the snapshot copy information in logical volume named `lv15_snap`
- create `lv15_snap` with a size of 128 megabytes
- remove the snapshot copy information from `lv15_snap` after the backup process but would not remove the lv15_snap logical volume

Example 2: Placing the entry `/myapp:myappsnap:2G:Y` in the Configuration File would:

- create a snapshot copy of the JFS2 Filesystem named `/myapp`
- store the snapshot copy information in logical volume named `myappsnap`
- create `myappsnap` with a size of 2 gigabytes
- remove the snapshot copy information and the `myappsnap` logical volume after the backup process

Example 3: Placing the entry /logs:loglv_snap:0:N in the Configuration File would:

- create a snapshot copy of the JFS2 Filesystem named /logs
- store the snapshot copy information in logical volume named loglv_snap
- create loglv_snap with a size that is 30% of the size of /logs
- keep the snapshot copy information and the loglv_snap logical volume after the backup process

Maintaining Backup Command Files for Use with Snapshot Backups

The Maintain Backup Command Files menus are available to assist you with creating, changing, or removing backup scripts for use with the Snapshot Backup feature. Use of this feature is optional because you also have the choice of:

- manually building your own backup command scripts
- inputting the backup commands via the shell command prompt during backup processing

To create, change, or remove a **Backup Command File**:

1. Log in as the root user
2. Type smitty sysback and press Enter.
3. Select **Snapshot Backup Options** and press Enter.

   Note: You can access the same menu with the SMIT fastpath smitty sb_snapshot.

   The following menu will display:

Figure 41. Snapshot Backup Options Menu

```
 Snapshot Backup Options

 Move cursor to desired item and press Enter.

   Maintain Backup Command Files
   Perform a Snapshot Backup
   Maintenance Utilities




 F1=Help            F2=Refresh         F3=Cancel   F8=Image
 F9=Shell           F10=Exit           Enter=Do
```
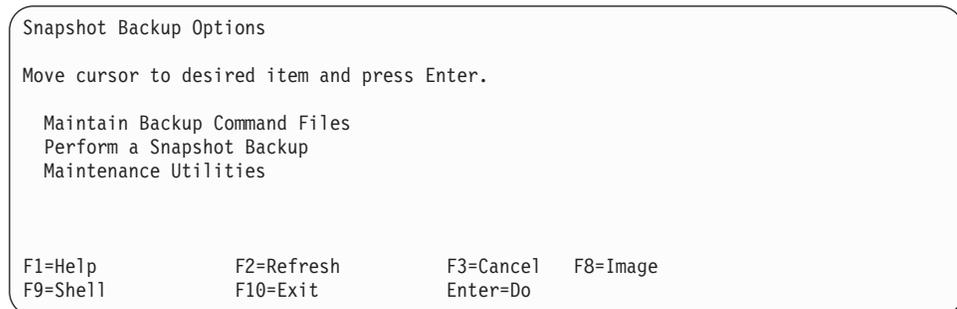
4. Select **Maintain Backup Command Files** and press Enter.

   The following menu is displayed:

Figure 42. Maintain Backup Command Files Menu

```
Maintain Backup Command Files

Move cursor to desired item and press Enter.

  Create a Backup Command File
  Change a Backup Command File
  Remove a Backup Command File


F1=Help              F2=Refresh          F3=Cancel    F8=Image
F9=Shell             F10=Exit            Enter
```

5. Select **Create a Backup Command File** and press Enter.

   The following menu is displayed:

```
           Create a Backup Command File

Move cursor to desired item and press Enter.

  Create a Generic Backup Command File
  Create a command file to: Backup the System
  Create a command file to: Backup a Volume Group
  Create a command file to: Backup a Filesystem
  Create a command file to: Backup a Logical Volume
  Create a command file to: Backup Files or Directories


F1=Help              F2=Refresh          F3=Cancel    F8=Image
F9=Shell             F10=Exit            Enter=Do
```

Figure 43. The Create a Backup Command File Menu

6. After selecting the desired backup selection, press Enter. You will be presented with a SMIT screen that looks like the actual backup options available to you for that type of backup.

7. After you have set the backup options, press Enter to create a backup script with those options. The backup process will not execute. Instead, an executable file will be created in the path specified in the previous screen. If no directory path is specified, the **Backup Command File** will be created in the **/usr/lpp/sysback/sbsnapshot** directory.

Note: If you chose the **Create a Generic Backup Command File** option, you will be prompted to enter a filename that will become an executable script template. You may then manually edit the script file to insert the necessary series of commands required to backup your environment.

```
                          Command Status
Command: OK stdout: yes stderr: no

[TOP]
Creating command file: my_generic_backup_file
Description: A sample backup file
---------------------------Contents--------------------------
#!/bin/ksh
# Command filename: /usr/lpp/sysback/sbsnapshot/my_generic_backup_file
#Description: A sample backup file

#Insert commands to execute below this line

#Insert commands to execute above this line

exit $?
[MORE]
```

Figure 44. The Completion Message for the Create a Generic Backup Command File Menu

Using the Snapshot Backup Maintenance Utilities

You can use the Snapshot Backup Maintenance Utilities to:
- Clean up snapshot copies after a failed backup attempt
- Optionally remove snapshot logical volumes
- Obtain information about each snapshot copy

Cleaning Up Snapshot Copies After a Failed Backup Attempt

To clean up snapshot copies after a failed backup attempt:

1. Log in as the root user.
2. Type smitty sysback and press Enter.
3. Select **Snapshot Backup Options** and press Enter.

   Note: You can access the same menu with the SMIT fastpath smitty
   sb_snapshot

   The following menu will display:

```
                    Snapshot Backup Options

Move cursor to desired item and press Enter.

  Maintain Backup Command Files
  Perform a Snapshot Backup
  Maintenance Utilities




F1=Help              F2=Refresh           F3=Cancel           F8=Image
F9=Shell             F10=Exit             Enter=Do
```

Figure 45. The Snapshot Backup Options Menu

4. Select **Maintenance Utilities** and press Enter.

   The following menu is displayed:

```
                Maintenance Utilities

Move cursor to desired item and press Enter.

   Recover from System Failure during a Snapshot Backup
   Remove Snapshot logical volumes
   Query Snapshot Backup logical volumes



F1=Help              F2=Refresh           F3=Cancel    F8=Image
F9=Shell             F10=Exit             Enter=Do
```
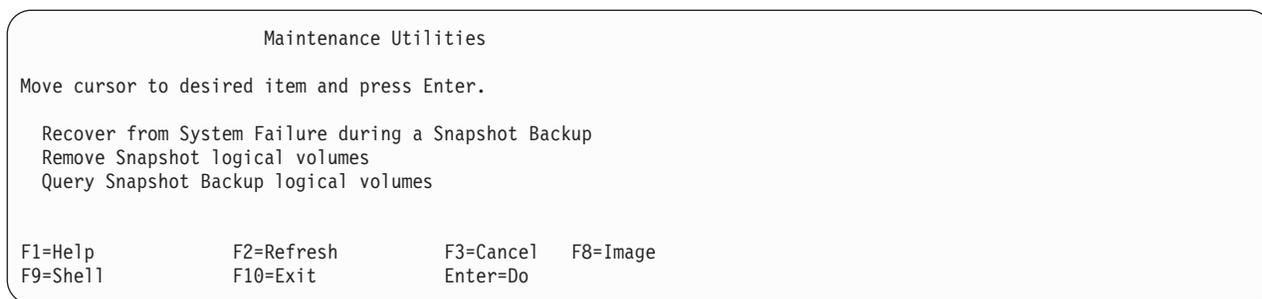
Figure 46. The Maintenance Utilities Menu

> 5. Select **Recover from System Failure during a Snapshot Backup** and press Enter.
>
>   The following screen is displayed:

```
Recover from a System Failure during a Snapshot Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                        [Entry Fields]

  Force Continue on Errors?    No
  Verbose?         yes



F1=Help       F2=Refresh    F3=Cancel   F8=Image
F9=Shell      F10=Exit      Enter=Do
```
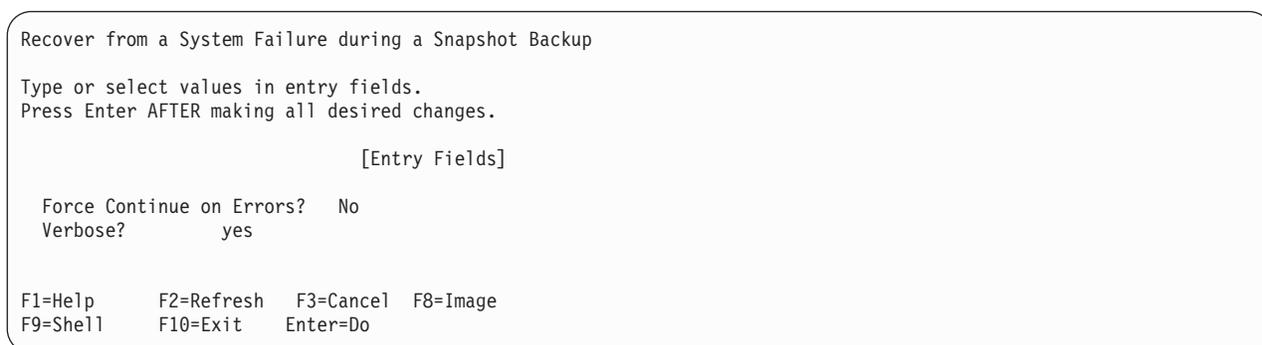
Figure 47. The Recover from System Failure during a Snapshot Backup Screen

> The fields have the following definitions:
>
> **Force Continue on Errors?**
>
> > Use this option to define how SysBack should response to error conditions.
> >
> > If **Continue on Error** is set to a value of "Yes", the processing will attempt to continue when an error occurs.
> >
> > If **Continue on Error** is set to a value of "No", the process will terminate when an error is encountered.
>
> **Verbose?**
> > Use this option to display all status and processing messages.
>
> 6. 6) After making the desired selections, press Enter. The process will reset the environment to allow the Snapshot Backups to be restarted again.

Optionally Removing Snapshot Logical Volumes

> To remove snapshot copies:
>
> 1. Log in as the root user.
> 2. Type `smitty sysback` and press Enter.
> 3. Select **Snapshot Backup Options** and press Enter.
>
>   **Note:** You can access the same menu with the SMIT fastpath `smitty sb_snapshot`
>
>   The following menu will display:

Figure 48. The Snapshot Backup Options Menu

```
                        Snapshot Backup Options

  Move cursor to desired item and press Enter.

    Maintain Backup Command Files
    Perform a Snapshot Backup
    Maintenance Utilities




  F1=Help            F2=Refresh         F3=Cancel     F8=Image
  F9=Shell           F10=Exit           Enter=Do
```

4. Select **Maintenance Utilities** and press Enter.

   The following menu is displayed:

```
  Maintenance Utilities

  Move cursor to desired item and press Enter.

    Recover from System Failure during a Snapshot Backup
    Remove Snapshot logical volumes
    Query Snapshot Backup logical volumes


  F1=Help            F2=Refresh         F3=Cancel     F8=Image
  F9=Shell           F10=Exit           Enter=Do
```

Figure 49. The Maintenance Utilities Menu

5. Select **Remove Snapshot Logical Volumes** and press Enter.

   The following screen is displayed:

```
                    Remove Snapshot Logical Volumes

  Type or select values in entry fields.
  Press Enter AFTER making all desired changes.
                                    [Entry Fields]
    Remove objects from configuration file    []
    Remove all objects created by sbsnapshot   no
    Verbose?               Yes
    Logical Volume List            []
    Volume Group List             []


  F1=Help            F2=Refresh         F3=Cancel     F8=Image
  F9=Shell           F10=Exit           Enter=Do
```
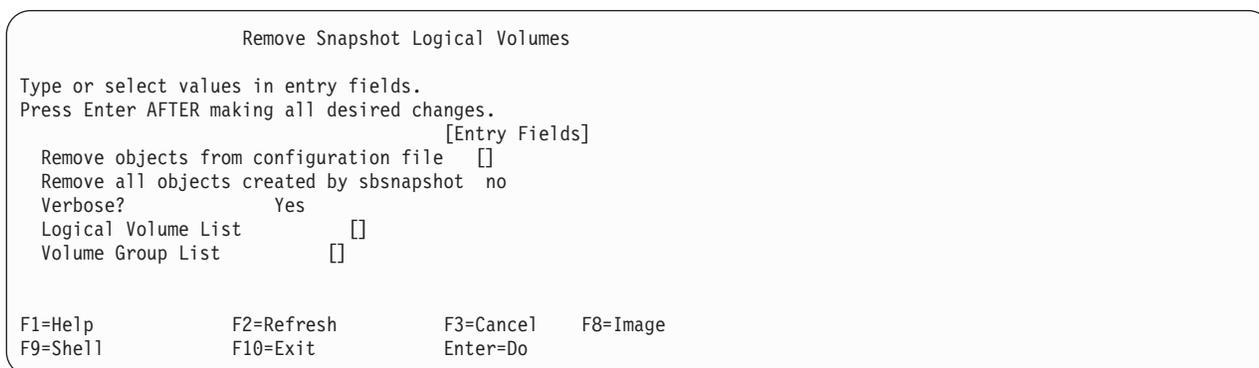
Figure 50. Remove Snapshot Logical Volumes Screen

The fields have the following definitions:

Remove objects from configuration file

> Use this option to specify the location and filename of a user defined
> configuration file that specifies the name of snapshot copy logical
> volumes that should be deleted. If the full path name of the file is not
> specified, the process will attempt to locate the specified filename in the
> **/usr/lpp/sysback/sbsnapshot** directory.

> **Note:** If this option is not specified, SysBack will either:
>
> - remove all snapshot object created by SysBack if the "Yes" value is specified for **Remove all objects created by sbsnapshot**
> - remove snapshot objects defined in the **Logical Volume and Volume Group** lists
>
> Please refer to the section **Snapshot Removal Configuration File Format** for additional information regarding the required format for this file.

Remove all objects created by sbsnapshot
Use this option to indicate that SysBack should delete all snapshot objects created by the Snapshot Backup processing. A "Yes" value will remove all snapshot copies from all Snapshot backups. Any snapshot copies created by the AIX snapshot command, separate from SysBack processing, will not be deleted.

Verbose?
Use this option to display all status and processing messages.

Logical volume list
Use this option to specify a list of snapshot copy logical volumes that should be removed. This option may be used alone, in conjunction with the **Volume Group List**, or in conjunction with a **Configuration File**. However, at least one of these three options must be specified.

Volume group list
Use this option to specify a list of volume groups that contain snapshot copy logical volumes that should be removed. This option may be used alone, in conjunction with the **Logical Volume List**, or in conjunction with a **Configuration File**. However, at least one of the these three options must be specified.

6. After making the desired selections, press Enter. The process will remove snapshot logical volumes created by the **sbsnapshot** command based on the options configured in the above screen.

Snapshot Removal Configuration File Format

The **Configuration File** option is used to specify the name of snapshot copy logical volumes that should be deleted. Use of this file is optional. If a **Configuration File** is not specified, SysBack will either:

- remove all snapshot object created by SysBack if the "Yes" value is specified for **Remove all objects created by sbsnapshot**
- remove snapshot objects defined in the **Logical Volume and Volume Group** lists

The **Configuration File** requires one line per entry, and must use the following format:

```
snapshot_LVname
```

```
snapshot_LVname2
```

Obtaining Information About Snapshot Copies

You can obtain information about any snapshot copies created by SysBack's Snapshot Backup Process. In order to obtain a list of existing snapshot copies:

1. Log in as the root user.

2. Type `smitty sysback` and press Enter.
3. Select **Snapshot Backup Options** and press Enter.

   Note: You can access the same menu with the SMIT fastpath `smitty sb_snapshot`

   The following menu will display:

```
Snapshot Backup Options

Move cursor to desired item and press Enter.

  Maintain Backup Command Files
  Perform a Snapshot Backup
  Maintenance Utilities



F1=Help              F2=Refresh          F3=Cancel     F8=Image
F9=Shell             F10=Exit            Enter=Do
```

Figure 51. The Snapshot Backup Options Menu

4. Select **Maintenance Utilities** and press Enter.
   The following menu is displayed:

```
Maintenance Utilities

Move cursor to desired item and press Enter.

  Recover from System Failure during a Snapshot Backup
  Remove Snapshot logical volumes
  Query Snapshot Backup logical volumes


F1=Help              F2=Refresh          F3=Cancel     F8=Image
F9=Shell             F10=Exit            Enter=Do
```

Figure 52. The Maintenance Utilities Menu

5. Select **Query Snapshot Backup Logical Volumes** and press Enter.
   Below is an example of the output that may be displayed:

```
                    Command Status
Command: OK stdout: yes stderr: no

[TOP]

Snapshots for object  /dev/lv16  ( /test3 )
Current Location 512-blocks Free   Time
/dev/lv17    262144   261000   Tue  Nov 29 15:24:38 CST 2005
/dev/lv20    262144   123456   Wed Nov 30 20:18:38 CST 2005


 [MORE]
```

Figure 53. Figure X. The Completion Output of the Query Snapshot Backup logical volumes Menu

Chapter 8. LVM Only Backups

LVM only backups allow you to back up only the Logical Volume Manager (LVM) information for the entire system. LVM Only backups may be written to CD/DVD, tape, virtual device, TSM server, or a directory device. These backups can be used to:

- recreate empty LVM structures / "containers" on the same, or new system, in normal mode
- supplement the system installation process when restoring the system using backups created by the TSM Backup/Archive client

This backup type will not back up any of the system or user data on the system. However, the media is bootable. LVM Only Backups can be stored on all supported backup devices: disk image file, tape, CD/DVD devices, or to a Tivoli Storage Manager server. The backup destinations may be locally attached or remotely accessed over the network. Just like any other SysBack backup type, the LVM Only Backup can be performed as a default "push" backup or a centrally administered "pull backup".

- as boot media
- to recreate LVM structures in normal mode
- as a part of the system installation and recovery process when restoring the system using backups generated by the TSM Backup/Archive client. For more information about using an LVM Only backup during the system installation process, please refer to Chapter 14, "System Installation and Maintenance," on page 185

LVM Only Backups are restored using the Recreate Volume Groups, Logical Volumes, and File systems process explained in Chapter 12, "Recreating or Restoring from Backups," on page 151 just as you would recreate any of these LVM structures using a Full System, Volume Group, Logical Volume, or File system Backup image.

Before performing an LVM Only backup, log in to the system as a root user. This ensures that you have the appropriate permissions required to access LVM information and attributes.

To create an LVM Only backup:

1. From the Backup Options menu, select LVM Only Backup. Note: From a command line, type `smitty sb_sblvmbackup`.
2. Select the volume group or groups to include in the backup from the list displayed. To select a single group, highlight the group and press Enter. To select multiple groups, highlight each group and press F7. Then, press Enter to continue.
3. On the Device Selector screen, highlight the device you want to use and press Enter.
4. The following screens illustrate the various options available for this process based on the type of backup device selected.

Figure 54. Options and Values Available for All Backup Device Types

```
                         LVM Only Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.
        [Entry Fields]

 Backup Data Hostname                   hambone.austin.ibm.com
Device name                 /dev/rmt0
Device or file name             tsm0
Images directory          [/usr/lpp/sysback/images/local]

 OPTIONS COMMON TO ALL DEVICE TYPES
 Existing Volume Group Information File      []
 Create a power backup?            no
 Include non-JFS logical volumes?        yes
 Preserve physical partition mapping?      no
 Limit Logical Volume and Disk Information    No
 User Description               []
 File containing list of objects to be included  []
 Name of non-rootvg volume groups to include    []
 PULL BACKUP OPTIONS
 Hostname to backup            []

F1=Help           F2=Refresh        F3=Cancel         F4=List
F5=Reset          F6=Command        F7=Edit           F8=Image
F9=Shell          F10=Exit          Enter=Do
```

The fields have the following definitions:

Backup Data Hostname
> Use this option to indicate the hostname of the data destination system on which the selected backup device or file exists. You may edit this field as necessary to specify the hostname of a remote system not listed in the device selector dialog screen. This is option useful when initiating a Pull Backup.

Device name
> The device, if a tape drive or virtual device was selected. You may edit this field as necessary to specify a device on a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Device or file name
> The device, if a TSM Virtual device was selected. You may edit this field as necessary to specify a device on a remote system not listed in the device selector dialog screen. This is useful when initiating a Pull Backup.

Images directory
> The directory name, if previously selected. You cannot change this field from this screen.

Existing volume group information file (Optional)
> when you have created a customized LVM structure using the **mkvginfo** command and would like that LVM structure stored in the backup rather than the LVM Information as defined on this system.

Create a Power Backup? (Optional)
> Use this option to create a power backup. The power backup differs from the regular system backup in that all file system data is backed up as raw logical volume data. This can increase the performance of the backup and restoration of the data but imposes certain limitations on the system installation and restoration of data from the backup:

- No file system attributes or mount point can be changed during a system installation from this backup.
- The logical volume name, logical volume size, and stripe size attributes of the logical volumes cannot be changed during a system installation from this backup.

Include non-JFS logical volumes? (Optional)

Default=yes. Use this option to specify whether or not to exclude all non-journaled file systems (raw logical volumes) from the backup. Press the Tab key to change the value to "no". If you select "no", all raw logical volume data is excluded from the backup, but the logical volumes can be recreated using the LVM information on the backup. If you select "yes", all raw logical volumes are included on the backup.

Preserve physical partition mapping?

Default=no. Selecting "yes" to this option ensures that all logical volumes will be recreated from this backup using the same physical partitions that are currently allocated to them. Unless the logical volumes were originally created using physical partition maps, it is generally recommended that this option not be set to "Yes". This is because fragmentation that develops over time as logical volumes and file systems expand is preserved. When you recreate a volume group or logical volume or perform a system installation, you can choose whether or not to use the prior partition map. If the original physical volumes do not exist or are not large enough to contain the same partitions, the logical volumes will be recreated without using the maps.

Limit Logical Volume and Disk Information? (Optional)

Use these options to control the amount of LVM data which is collected during backup.

When recovering a system in which all of the volume group, logical volume, file system and physical disk information is stored, the preprocessing required to read and to display the installation options can be time consuming. When the system being recovered is a different system from which the backup was created, the preprocessing can take even longer. If you are only recovering part of the system, you may want to limit the amount of disk preprocessing required for you specific recovery scenario.

There are 3 options related to the collection of disk and LVM information:

No   This is default option. All of the active volume group, logical volume, file system, and physical disk information will be included in the backup regardless of whether or not the volume group has been specified for backup.

Disk

This option works just as the default "No" option except that disk information will not be collected for any disk that is not associated with an active volume group. As with the "No" option, this information is collected for all volume groups regardless of whether or not the volume group has been specified for backup. Example: If the "lspv" command shows the following output:

Example: If the "lspv" command shows the following output:

```
hdisk0      000ac63cb85d28d4              rootvg      active
hdisk1      000ac63cea9291ab              sbvg        active
hdisk2      000ac63cea9291ac              none        active
```

the hdisk0 and hdisk1 disk information would be included in the back but the information for hdisk2 would not.

LVM and Disk

This option works just as the default "No" option except that it applies only to volume groups that have been specified for backup.

Example: The system has 3 active volume groups named, rootvg, sbvg, and datavg. If you specified only the rootvg volume group for backup:

- all of the LVM and disk structure information for rootvg will be backed up
- none of the LVM and disk structure information sbvg and datavg will be backed up

User description (Optional)
Default is Blank. Enter up to 60 characters of descriptive information to add to the volume label on the backup. Do not use single (') or double (") quotation marks in the description.

User description information file (Optional)
Use this option to specify a file name that contains the user description for this backup. This is useful when your description contains characters note supported by the User Description SMIT option. Also, this is useful when using ASCII SMIT or an ASCII console as they do not support the input of Double-byte characters (DBCS) or Bi-directional (Bi-Di) text.

File containing a list of data to be backed up (Optional)

Default is blank. Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

In all other cases, use of this option is not required as the specification of non-rootvg volume groups is indicated in the field Non-rootvg volume groups to include.

Note: This use of wild cards in this list is not supported

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of one file, directory, logical volume, file system, or volume group name.

Note: This option must also be used when you are specifying a volume group name that has:
- a space in the name
- characters in the name that are interpreted by the shell as special. For example: @ ; * . , $
- characters in the name

- Specifying a volume group name with these characteristics in the Non-rootvg volume groups to include field will cause the process to error.

Non-rootvg Volume Groups to include
>   The default displays the volume groups selected on the previous screen, if any. You can add or delete volume groups from this. You can also press F4 to list the available volume groups and select from the list using F7.

Hostname to Backup (Optional)
>   Specify the hostname of the backup system, the machine that will send its data to the data destination server. i.e. This is the host that provides the specified backup device. This option is used with Pull Backups.

Figure 55. Default Options and Values Available for File / Directory Devices

```
                         LVM Only Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                            [Entry Fields]

 FILE / DIRECTORY DEVICE SPECIFIC OPTIONS
 Backup file ID          [07270042]
 Dynamically Created Backup File ID    no
 Host read permissions       all hosts
 User read permissions       all
 Overwrite existing backup with same ID? No


F1=Help            F2=Refresh         F3=Cancel         F4=List
F5=Reset           F6=Command         F7=Edit           F8=Image
F9=Shell           F10=Exit           Enter=Do
```

The fields have the following definitions:

Backup file ID
>   Default=date/time (MMDDhhmm). Uniquely identifies the backup. You can change this field to any value but it cannot contain single (') or double (") quotes.

Dynamically Created Backup File ID (Optional)
>   This option lets you generate a dynamic backup file ID. It uses the same current date and time values at the time of command execution as the ID. If the value of the **Dynamically Created Backup File ID** field set to yes, it will overwrite the **Backup File ID** field.

Host read permission
>   have permission to read, or restore from this image. Press Tab to limit read permission to the original host or the server on which the file is written. This option is active only when you back up to a disk image file.

User read permission
>   Default=all users. By default, any user on a host with access to the system and directory on which this file is written has permission to read, or restore from, this image. Press Tab to limit the read permission to only the original user, the root user on the original host, or the server to which the file is written. This option is active only when you back up to a disk image file.

Overwrite existing backup with same ID? (Optional)
Default=no. If the Backup File ID field contains a value already used for an existing system backup, change this field to "yes" by pressing Tab. Doing so indicates that you want to overwrite the previous backup with this backup. After you begin this backup, the prior disk image files are removed and cannot be recovered. This field is displayed only when you back up to a disk image file.

Figure 56. Default Options and Values Available for Tape Devices

```
                        LVM Only Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                            [Entry Fields]

 Rewind tape before starting backup?       yes
 Forward to end of tape before starting backup?  no
 Eject tape at end of backup?         no
 Eject all write protected tapes?        no


F1=Help            F2=Refresh        F3=Cancel         F4=List
F5=Reset           F6=Command        F7=Edit           F8=Image
F9=Shell           F10=Exit          Enter=Do
```

The fields have the following definitions:

Rewind tape before starting backup?
Default=yes. Press Enter to rewind the tape before the backup begins. If you are placing multiple backup images onto a single tape, then select "no" to place this backup on the tape at the current location. This option is displayed only when you back up to a tape device. For an LVM Only Backup, tape boot information is placed on the tape at the beginning of the first backup. This information is not placed on the tape for subsequent backups.

> **Note:** If this is the first backup to this tape, or if you have restarted the system, reinserted the tape, or changed the tape drive block size, you should select to rewind the tape. Only if you have completed another backup and have not performed any of these functions will the tape be positioned correctly at the end of the previous backup image.

Forward to end of tape before starting backup?
This option lets you fast forward to the end of the last SysBack backup on the tape for all backup types. Use this option when stacking multiple backups on the same tape that has been rewound or ejected. This option should also be used when the system has been restarted or the block size of the tape drive has been changed from the last backup. This eliminates having to manually position the tape before stacking a backup image.

Eject tape at end of backup?
Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

Eject all write protected tapes
Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

Figure 57. Default Options and Values Available for All CD/DVD Devices Using the UDF Format

```
                          LVM Only Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.


                                            [Entry Fields]

 CD/DVD DEVICE SPECIFIC OPTIONS — UDF TYPE
 Backup media format         Universal Disk Format
 TSM Option             none
 Backup file ID            [07270042]
 Dynamically Created Backup File ID    no
 Append backup to DVD         no
 Platform type(s) for CD/DVD boot image  [chrp]


CD/DVD HOST OPTIONS
 Build Temp Work Spaces on       N/A
 Hostname of CD/DVD server       []


F1=Help            F2=Refresh        F3=Cancel        F4=List
F5=Reset           F6=Command        F7=Edit          F8=Image
F9=Shell           F10=Exit          Enter=Do
```

The fields have the following definitions:

Backup Media Format
This option indicates this backup will use the (UDF) Universal Disk format. This option is set via a selection menu prior to this screen.

TSM Option
Use this option to indicate which TSM client binaries to include in this backup. The default is "none". The other options available are:

Include TSM API Code
This option allows you to store the contents of the

/usr/tivoli/tsm/client/api directory. These binaries are required when using the backup as the boot media for a system installation process that will use SysBack backups stored in a TSM server.

Include TSM BA Code
This option allows you to store the contents of the **/usr/tivoli/tsm/client/ba** directory. These binaries are required when using the backup as the boot media for a system installation process that will use backups created by the TSM Backup/Archive client.

Include Both TSM API & TSM BA Code
This option allows you to store the binaries of the TSM API client and the TSM BA client.

Backup file ID
Default=date/time (MMDDhhmm). Uniquely identifies the backup. You can change this field to any value but it cannot contain single (') or double (") quotes.

Dynamically Created Backup File ID (Optional)
This option lets you generate a dynamic backup file ID. It uses the same current date and time values at the time of command execution as the ID. If the value of the **Dynamically Created Backup File ID** field set to yes, it will overwrite the **Backup File ID** field.

Append Backup to DVD
Selecting the "Yes" value will cause the mksbcd process to append data to an existing UDF file system (aka the DVD). This flag will cause the DVD to be mounted so that no data on the DVD is lost. This flag is only valid when using a previously UDF formatted DVD. Selecting the "No" value will execute the full mkscbcd backup process which effectively erases all data on the DVD.

Platform Types(s) for CD/DVD boot image (Optional)
Specify the platform type of the system where the CD/DVD will be utilized. Select one or more options. The default value is the platform of the system.

Build Temp Workspaces on
Specify this option when performing backups to a remote DVD device. Specify the "Client" value to create the backup_image filesystem on the local system. Specify the "Server" value to create the backup_image filesystem on the remote system. The default option is "N/A".

Hostname of CD/DVD server (Optional)
Specify the name of the remote server to use when using the "Client" or "Server" value in the **Build Temp Workspaces** option.

Figure 58. Figure X. Default Options and Values Available When for All CD/DVD Devices Using the ISO Format

```
  Type or select values in entry fields.
  Press Enter AFTER making all desired changes.

                     [Entry Fields]

   CD/DVD DEVICE SPECIFIC OPTIONS — ISO TYPE
   Backup media format         ISO9660 Rockrodge Format
   TSM Option            none
   Backup file ID           [07270042]
   Dynamically Created Backup File ID    no
   Platform type(s) for CD/DVD boot image  [chrp]

   HOST OPTIONS
   Build Temp Work Spaces on       N/A
   Hostname of CD/DVD server       []

   Create the CD/DVD now?        yes
   Media Type            [dvd]

   WORK SPACE OPTIONS
   File system to store CD/DVD structure    []
   File system to store final CD/DVD image  []

  F1=Help           F2=Refresh          F3=Cancel          F4=List
  F5=Reset          F6=Command          F7=Edit            F8=Image
  F9=Shell          F10=Exit            Enter=Do
```

The fields have the following definitions:

Backup Media Format

> This option indicates this backup will use the ISO9660. This option is set
> via a selection menu prior to this screen.

TSM Option

> Use this option to indicate which TSM client binaries to include in this
> backup. The default is "none". The other options available are:

> **Include TSM API Code**
>
> > This option allows you to store the contents of the
> > **/usr/tivoli/tsm/client/api** directory. These binaries are required
> > when using the backup as the boot media for a system installation
> > process that will use SysBack backups stored in a TSM server.

> **Include TSM BA Code**
>
> > This option allows you to store the contents of the
> > **/usr/tivoli/tsm/client/ba** directory. These binaries are required when
> > using the backup as the boot media for a system installation
> > process that will use backups created by the TSM Backup/Archive
> > client.

> **Include Both TSM API & TSM BA Code**
>
> > This option allows you to store the binaries of the TSM API client
> > and the TSM BA client.

Backup file ID

> Default=date/time (MMDDhhmm). Uniquely identifies the backup. You
> can change this field to any value but it cannot contain single (') or double
> (") quotes.

Dynamically Created Backup File ID (Optional)

> This option lets you generate a dynamic backup file ID. It uses the same
> current date and time values at the time of command execution as the ID.

If the value of the **Dynamically Created Backup File ID** field set to yes, it will overwrite the **Backup File ID** field.

Platform Types(s) for CD/DVD boot image (Optional)
Specify the platform type of the system where the CD/DVD will be utilized. Select one or more options. The default value is the platform of the system.

Build Temp Workspaces on
Specify this option when performing backups to a remote DVD device. Specify the "Client" value to create the `backup_image filesystem` on the local system. Specify the "Server" value to create the `backup_image filesystem` on the remote system. The default option is "N/A".

Hostname of CD/DVD server (Optional)
Specify the name of the remote server to use when using the "Client" or "Server" value in the **Build Temp Workspaces** option.

Create CD/DVD now?

Selecting the "Yes" value for this option will the **mksbcd** process to write directly to DVD. The backup will not be staged to the `backup_image_ dir`. Instead, the backup images are copied directly to the UDF file system provided that the backup image will fit on a single DVD.

Selecting the "No" option Stops the command before writing to media without removing the final CD image. This leaves you with a final Rockridge Image that may be burned to CD/DVD at a later time. The `backup_image` file system and the `cd_fs` file system will be removed leaving only the `cd_image` file system with the Rockridge Image (ISO). If you select this option, you will have to manually burn the image to CD/DVD yourself using the GNU **burn_cd** function instead of using SysBack.

Media Type
Use this option to specify the device type. Select either CD media or DVD media.

Filesystem to store CD/DVD structure (Optional)
Use this field to specify the name of an existing file system to be used in place of the default `cd_fs` file system. You must ensure that there is enough space in this file system as outlined in the section entitled Space. If this flag is not specified, the default `cd_fs` file system created is /mksbcdPID/cd_fs. If there is not enough space in this file system, the **mksbcd** command will enlarge the file system with the AIX **/usr/sbin/chfs** command to make it large enough. If the "chfs" command fails, then so will the "mksbcd" command. This flag is optional.

Filesystem to store final CD/DVD image (Optional)
Use this field to specify the name of an existing file system to be used in place of the default `cd_image` file system. You must ensure that there is enough space in this file system as outlined in the section entitled Space. If this flag is not specified, the default `cd_image` file system created is /mksbcdPID/cd_image. If there is not enough space in this file system, the **mksbcd** command will enlarge the file system with the AIX **/usr/sbin/chfs** command to make it large enough. If the "chfs" command fails, then so will the **mksbcd** command. This flag is optional.

Chapter 9. Local User Access

When you install SysBack, all users on the local system are, by default, granted access to all backup devices on the system. They are also allowed to create backups in the default directory **/usr/lpp/sysback/bf/local/all**. The following options are used to change user access by adding or deleting the devices or directories that each user can access.

To access the local device or directory access menu:

1. At a command line, type smit.
2. Select **IBM Tivoli Storage Manager for System Backup and Recovery**.
3. Select **Configuration Options**.
4. Select **Local User Access**.

You can also access this menu using the fastpath. To do this, type smit sb_local at a command line.

The following screen is displayed:

```
                         Local User Access

Move cursor to desired item and press Enter.

   Add or Change Local User Device/Directory Access
   List User Access
   Remove User Access













  F1=Help              F2=Refresh           F3=Cancel            F8=Image
  F9=Shell             F10=Exit             Enter=Do
```
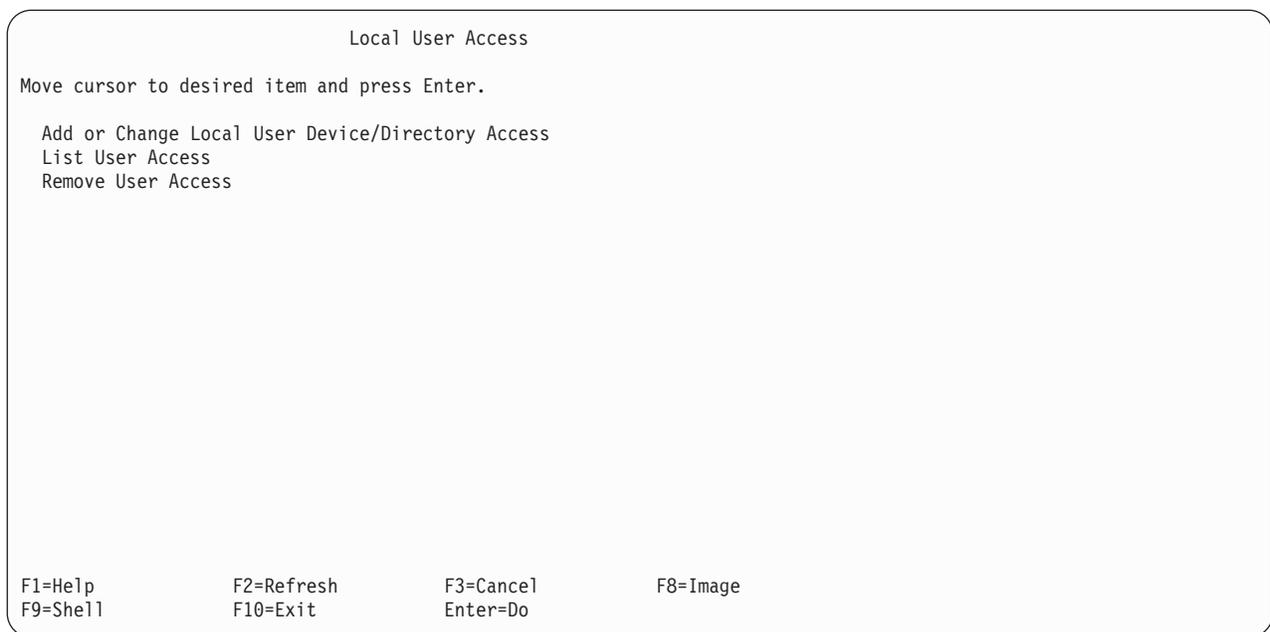
Figure 59. The Local User Access Menu

Detailed instructions for each of the selections in the Local User Access menu follow.

Understanding Local User Access Permissions

SysBack provides flexible access for device, directories, and so on. For instance, you can assign specific devices and directories to each user on the system, or assign a device to all users on the system except specific users. Before you assign access, it is important to understand the priority of the permission records and how they are used.

Assume the following records exist:

- Record 1
  - Users to allow = all
  - Users to deny = greg peter bobby
  - Devices allowed = /dev/rmt0 vdev0
  - Directories allowed = /usr/lpp/sysback/bf/local/all
- Record 2
  - Users to allow = root
  - Users to deny = null
  - Devices allowed = all
  - Directories allowed = /usr/lpp/sysback/bf/local/root
- Record 3
  - Users to allow = alice
  - Users to deny = null
  - Devices allowed = /dev/rmt1
  - Directories allowed = null

Based on the information above, the following statements are true:

1. Users *greg*, *peter* and *bobby* do not have backup access on this system because they are explicitly denied access under *all* users. You can only deny access to users when defining access for "all" other users. You cannot create a permission record for any users that have been explicitly denied access.

2. User *root* has access to all devices (tape and virtual). User *root* is also provided a disk image file backup option, with the default filename contained in the **/usr/lpp/sysback/bf/local/root** directory. You can change the default name of the backup file at backup time, but the file must exist in the **/usr/lpp/sysback/bf/local/root** directory or one of its subdirectories.

3. User *alice* has access only to tape device /dev/rmt1. Because there are no directories defined for backup image files, no disk image backup option is provided to this user.

4. All other users (all users except those explicitly denied and those explicitly defined) are provided access to tape device /dev/rmt0 and virtual device vdev0. Those users are also provided a disk image backup option in the **/usr/lpp/sysback/bf/local/all** directory. They can back up to only those devices and directories defined in this record.

Also note that, if you remove user *greg* from the list of users denied access, he is automatically provided access under the same record as *all* other users. Likewise, removing user *alice* does not disable access, because she is not explicitly denied, but her permission also defaults to that of *all* users.

Adding or Changing Local User Device/Directory Access

All users on the system are provided access to all of the backup devices on the system when SysBack is first installed. This is accomplished by providing a permission record for a user called *all*. You might not want certain users to have access to all devices and backup directories, so you might want to deny specific users access, or change the device or directory list that specific users are allowed to use. The devices and directories specified when using this option determine the list

of backup options that users receive when performing backups using SMIT, and those devices or directories that other SysBack commands, executed at the command line, can read or write to.

If you do not want all users on the system to be granted the same access, remove access to user *all* before setting up access to specific users. This can help avoid confusion in the future.

To add or change device or directory access to local users:

1. From the Local User Access menu, select **Add or Change Local User Device/Directory Access**.

   Note: You can also type smit sb_cfglocaccess at the command line.

2. Enter the name of the user whose access you want to add or change.

   The default entry is *all*. Press Enter to select this entry, change the entry to another user name, or press F4 to list user records previously configured and select a user from the list.

   The following screen shows the system default permission record for *all* users on the system:
   The fields have the following meanings:

```
                Add or Change User Device/Directory Access


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                [Entry Fields]
* User name to allow                             all
        If all: Users to deny access            []                      +
  Tape or Virtual Devices for backups or "all"  [all]                   +
  Directory path for backup images              [/usr/lpp/sysback/bf/lo> +
  Directory path for network install images     [/usr/lpp/sysback/image> +







F1=Help           F2=Refresh        F3=Cancel        F4=List
F5=Reset          F6=Command        F7=Edit          F8=Image
F9=Shell          F10=Exit          Enter=Do
```

Figure 60. The System Default Permission Record for "all" Users

User name to allow
> The user name entered or selected on the prior screen. You cannot change this field on this screen.

If all: Users to deny access
> Default=(blank/none). If you selected to add or change the record for "all" users, enter a list of users, separated by spaces, to be explicitly denied access. In other words, all users except those specified here will be permitted.

Tape or Virtual Devices for backups or "all"
> Default=(blank/none). If the specified user is allowed to back up to a tape drive or virtual device, enter the device name or names, separated

by spaces. You can also press F4 to list the available tape and virtual devices on the system and select one or more devices from the list using F7.

Enter "all" to provide a backup option for this user for all tape and virtual devices on the system.

Only the devices entered here are displayed on the SMIT menus when the user selects a backup.

Directory path for backup images
Default=(blank/none). If you want to allow the specified user to perform backups to *disk image files*, enter the directory or directories, separated by spaces, that the user can back up to. Press F4 to display a list of backup image directories already selected, or the default directory of **/usr/lpp/sysback/bf/local/username.** Highlight each entry you want to save and press F7. Press Enter to continue.

When performing any SysBack backup, you are provided a directory backup option for each directory specified. The actual file created in the directory is named according to the information in Chapter 2, "SMIT Overview," on page 5.

Directory path for network install images
Default=(blank/none). This field applies only to the "root" user, because only the root user can create a system backup. Enter information in this field only when configuring the "root" user or "all" users if root is not specifically defined.

Enter each directory for which you want to save installation images, each separated by space. Press the F4 key to display a list of installation image directories already selected, or the default directory of **/usr/lpp/sysback/images/local**. Highlight each entry you want to save and press F7. Press Enter to continue.

When performing the option to **Backup the System**, the user is provided a directory backup option for each directory specified. Also, when this or other systems attempt to perform a network installation, all backup images in the specified directories that the client system has permission to read are displayed as network install options.

3. Press Enter to complete this process. Repeat the above steps to grant access to other users.

Listing User Access

Use the **List User Access** option to display a list of all user permission records. The list includes users permitted and denied, along with the devices and/or directories that each user is permitted to access. To list the users:

1. From the Local User Access menu, select **List User Access**.

   Note: You can also list users by typing `smit lb_lslocaccess` at a command line.

The list is displayed with no further prompts.

Removing User Access

Use the **Remove User Access** option to remove permission records.

Removing a specific user's permission record does not automatically deny that user access if there is also a permission record defined for "all" users. If a record exists for "all" users, and you want to deny access to a specific user, you must remove the user's permission record, if any, and then add that user name to the list of users to deny using the **Add or Change Local User Device/Directory Access** option.

To remove user access:

1. From the Local User Access menu, select **Remove User Access**.

   Note: You can also type the fastpath `smit sb_ucfglocaccess` at a command line.

2. Select a user from the list of users with permission records currently defined.

   If a record exists for "all" users, an option for "all" is displayed. If you remove the record for "all" users, all users except those with permission records explicitly defined for them will be denied access.

3. Press Enter to confirm your choice. Doing so removes the selected permission record from the file with no further prompts.

Chapter 10. Remote Services

Remote Services is an optional feature of SysBack that enables a host attached to a network using TCP/IP to read and write backups to and from either tape drives or disks attached to a remote host. This enables a single host to act as a backup server for other hosts on the network that do not have a local tape drive attached.

With Remote Services, a backup server machine can enable specific hosts and users on those hosts to access the local devices or directories. Remote Services also enables client hosts to be installed from a device or disk image file on a network installation server.

To use Remote Services, SysBack must be installed on each host that you want to act as a backup server, as well as each host that backs up its data to the server. TCP/IP must also be installed on each host to use Remote Services functions.

To access the menu for configuration and maintenance of a backup server or client:
1. Type `smit` at a command line.
2. Select **IBM Tivoli Storage Manager for System Backup and Recovery**.
3. Select **Configuration Options**.
4. Select **Remote Services**.

You can also use the following fastpath to access this menu: `smit sb_remote`.

The following screen is displayed:

```
                        Remote Services

Move cursor to desired item and press Enter.

  Server Options
  Client Options
  Firewall Port Options




  F1=Help            F2=Refresh          F3=Cancel          F8=Image
  F9=Shell           F10=Exit            Enter=Do
```
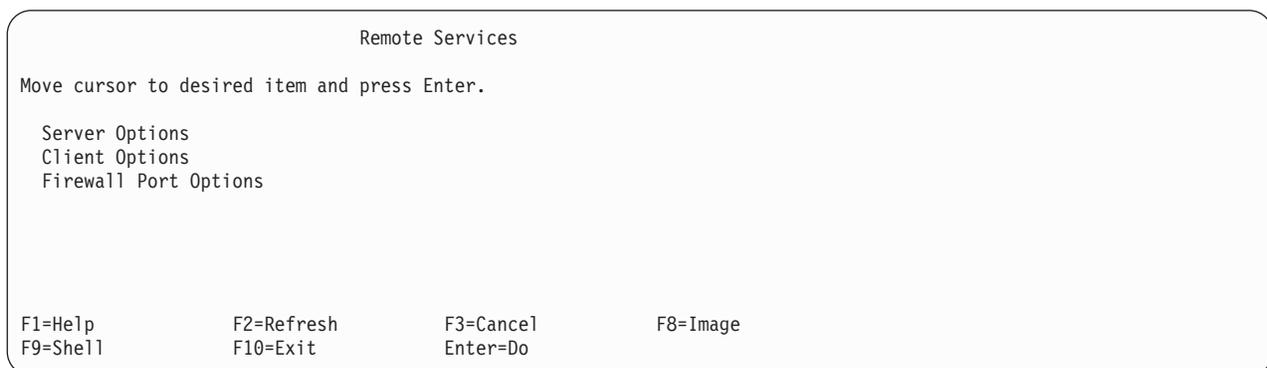
Figure 61. The Remote Services Menu

This first screen contains three options, one for server configuration, one for client configuration, and one for configuring network ports for communications through fire walls. The following screens show the options for each. Each of these options is described in the sections below.

```
                          Server Options

Move cursor to desired item and press Enter.

   Configure Remote Services
   Add or Change Client Host Access to this Server
   List Client Access
   Remove Client Access












F1=Help            F2=Refresh        F3=Cancel        F8=Image
F9=Shell           F10=Exit          Enter=Do
```
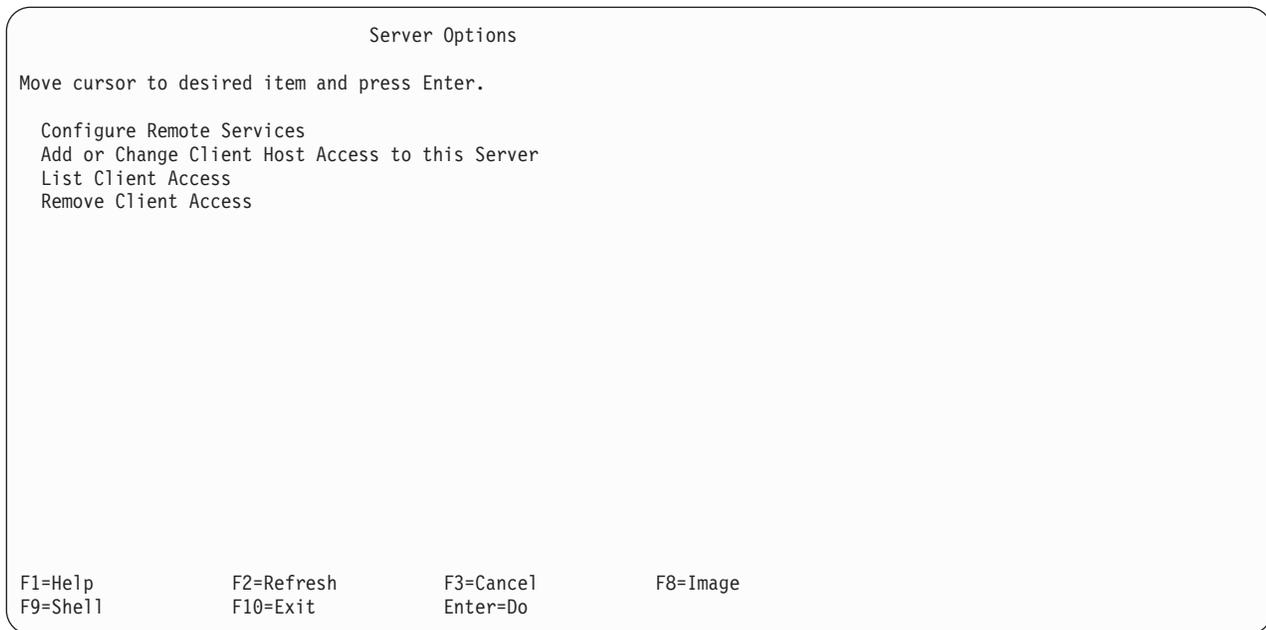
Figure 62. Server Options from the Remote Services Menu

```
                          Client Options

Move cursor to desired item and press Enter.

   Configure Remote Services
   Add or Change List of Remote Backup Servers
   List Remote Backup Servers
   Change Remote Access Checking
   Remove a Remote Backup Server












F1=Help            F2=Refresh        F3=Cancel        F8=Image
F9=Shell           F10=Exit          Enter=Do
```
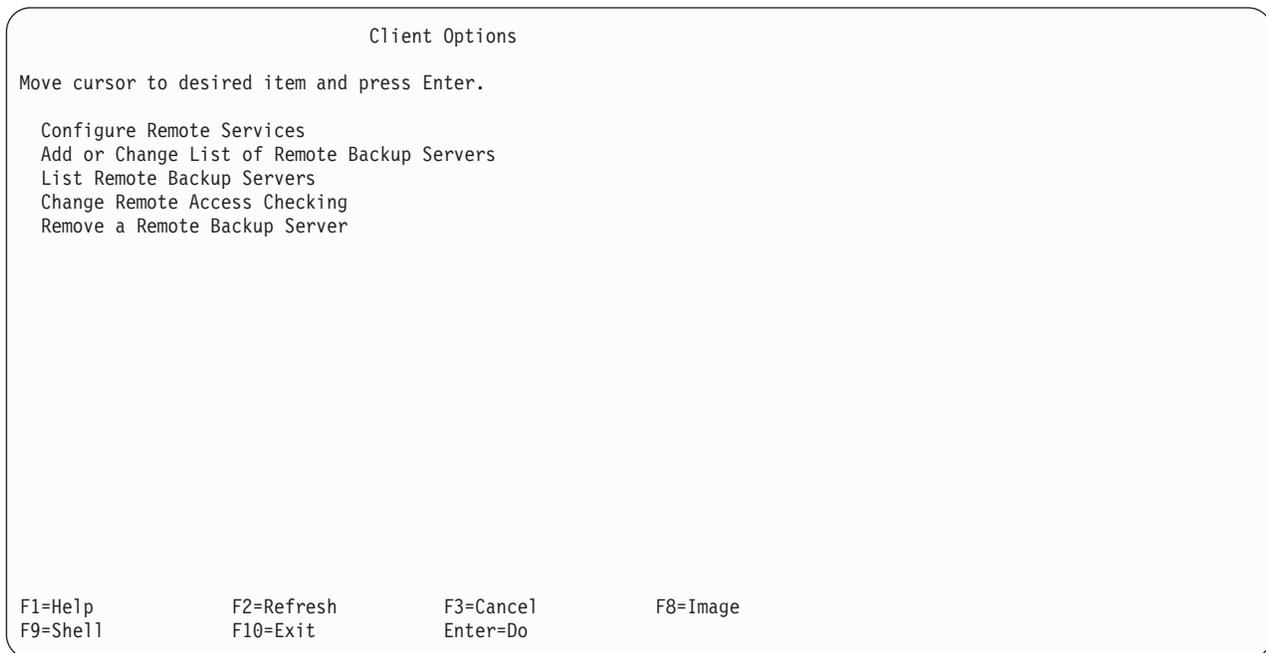
Figure 63. Client Options from the Remote Services Menu

```
                        Firewall Port Options

Move cursor to desired item and press Enter.

    Server to Client Firewall Options
    Client to Server Firewall Options




  F1=Help            F2=Refresh         F3=Cancel          F8=Image
  F9=Shell           F10=Exit           Enter=Do
```
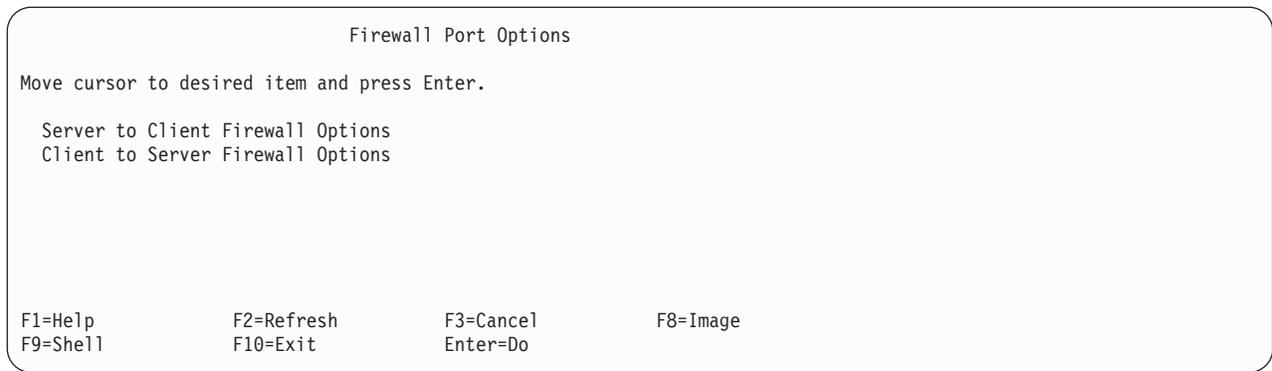
Figure 64. Firewall Port Options Menu

Understanding Remote Host and User Access Permissions

SysBack is very flexible as to which hosts, and users on those hosts, can access the devices or directories on the local system, as well as which devices or directories they may access. For instance, specific devices or directories or both can be assigned to all users on all client hosts, or all devices can be assigned to specific users on specific hosts.

The following example describes the permission records and how they are interpreted. Note that this is a complex example. Ordinarily, records are defined for all hosts, or for each specific host, but not both.

Assume the following client host/user records exist:
- Record 1
  - Hosts to Allow = venus
  - Hosts to Deny = null
  - Users to Allow = root
  - Users to Deny = null
  - Devices allowed = all
  - Backup installation directory = /usr/lpp/sysback/bf/venus/root
  - Network installation directory = null
- Record 2
  - Hosts to Allow = venus
  - Hosts to Deny = null
  - Users to Allow = all
  - Users to Deny = bobby cindy
  - Devices allowed = /dev/rmt0
  - Backup installation directory = null
  - Network installation directory = null
- Record 3
  - Hosts to Allow = all
  - Hosts to Deny = null
  - Users to Allow = root
  - Users to Deny = null

- – Devices allowed = all
- – Backup installation directory = /usr/lpp/sysback/bf/all/all
- – Network installation directory = /usr/lpp/sysback/images/all
- Record 4
  - – Hosts to Allow = all
  - – Hosts to Deny = mars pluto
  - – Users to Allow = root
  - – Users to Deny = greg marsha
  - – Devices allowed = /dev/rmt0 vdev0
  - – Backup installation directory = null
  - – Network installation directory = null

Based on the above conditions, when a client host attempts to gain access to a server, permission records are checked on the server in the following order:

1. First, the permissions on the server are checked to ensure that the host attempting to gain access has not been explicitly denied access. Hosts denied access are shown only under the record assigned to "all" hosts. If, for example, any user on host *mars* that attempts to perform a backup to this server will receive a message that permission is denied.

2. Next, permission records are searched to ensure that the specific user has not been denied access. Users can be denied access under any record that applies to "all" users. If on any host user *marsha* attempts to gain access, she will be denied access because the host record for "all" hosts explicitly denies access to her. If user *cindy* on host *venus* attempts to gain access, she will be denied because she is explicitly denied access from *venus*. User *cindy* can perform a backup from any other hosts.

3. Assuming the host or user is not explicitly denied access, records are then searched for one matching the specific host and user. In the above example, if the *root* user on host *venus* attempts to gain access, this user will be allowed to backup to all devices and the **/usr/lpp/sysback/bf/venus/root** directory on the server.

4. If the above record does not exist, records are searched for one matching "all" users on the specific host. In the above example, if user *jan* on host *venus* attempts to gain access, she will obtain permission from the record assigned to *all* users on *venus*. She will therefore have access to only device */dev/rmt1* and no backup image directories.

5. Lastly, if none of the above succeed, records are searched for "all" users on "all" hosts. If user *alice* on host *neptune* attempts to perform a backup to the server, she will gain access under this record. She will therefore be allowed to back up to devices */dev/rmt0* and *vdev0* and to backup image directory **/usr/lpp/sysback/bf/all/all**.

Also note that, by removing the record for host *venus* and user *all*, all users on *venus*, except *root*, still have access to the devices and directories defined under the record for *all* users on *all* hosts. Note also that, by removing this record, users *bobby* and *cindy* also have access under *all* users on *all* hosts because they are no longer explicitly denied.

The entry for **network installation image directories** applies only to either the *root* user, or *all* users if the root user is not explicitly defined. This entry determines the directory or directories from which the installation image files will be listed during a network installation operation.

Backing Up, Listing, Verifying, or Restoring from Remote Backup Devices

After Remote Services is configured and remote devices are defined, the only differences in backing up, listing, verifying or restoring data to or from a remote tape drive or file is the initial selection of the device itself. When any backup option is selected from the SMIT menus, a list of available backup devices or directories is displayed.

After a remote server is configured, any device or directories on the server, for which the client has been granted access, are listed as well. The only difference is that the hostname of the server replaces the prefix "Tape," "VirDev," or "Dir" (indicating a tape device, virtual device, and directory respectively).

The SMIT options **List Backup Contents**, **Verify a Backup**, or **Restore Data from a Backup** display a list of devices and a list of available *disk image files* (backups to directory) for all directories on the server the client has access to.

When a server device or directory is selected, the server hostname is transferred to the **Hostname of server** field on the options screen. Then, SMIT includes The hostname of the server in the command to execute.

When executing any SysBack command from the command line, you need to add the "**-h** *hostname*" flag and parameter to the command to reference a remote, rather than local, device, file or directory.

Configure Remote Services

Before any machine can back up to a remote host, both the client and tape server machines must have Remote Services configured. When selecting this menu option, you are prompted to continue. Press Enter to continue configuring Remote Services.

To configure Remote Services:

1. On the Remote Services menu, select either **Server Options** or **Client Options**, depending on which you are configuring.
2. Select **Configure Remote Services**.
3. When you are asked if you want to continue, press Enter.

You must perform the above steps for each system that you want to use Remote Services. These steps are required before you can select any of the following options.

Adding or Changing Client Host Access to This Server

Before any client host can perform a backup to a remote server, the server must first enable permission to the client host and to the specific users on the client perform the backup operations. Providing access to client hosts does not automatically provide a backup option to the client. After providing access from the server, you must then use the option **Add or Change List of Remote Backup Servers** on the client to provide a remote backup option in SMIT.

If you want to provide access to the server for all client hosts on the network, you can define a single record that applies to all hosts. When doing so, you can exclude or deny access to specific hosts. You do this by providing a permission record for a

host called *"all"*. You might not want certain hosts to have access to all devices and backup directories, so you can deny specific hosts access or change the device or directory list that specific hosts are allowed to use. The devices and directories specified when using this option determine the list of backup options that users on the client host receives when performing backups using SMIT and those devices or directories that other SysBack commands, executed at the command line, are permitted to read or write to.

To add or change client host access to the server:

1. From the Server Options menu, select **Add or Change Client Host Access to this Server**.

   Note: From the command line, use the fastpath smit sb_cfgremaccess.

2. Enter the host name for the client system. This can be the name of the client host or "all" to apply the record to all hosts. You can also press F4 to generate a list of hosts already configured to change an existing record. The default entry is "all."

   Note: You can enter either the hostname or a full domain name. If you are operating in a domain network, use the full domain name of the client host. Using only the host name in a domain network allows access to any host on the network with the given host name, even though they might be in different domains.

3. Enter the user name. The default entry is "all". Press Enter to select this entry, change the entry to another user name, or press F4 to list user records previously configured for the selected host and select a user from the list.

   The host name and user name selected are transferred to the following options screen. This example shows the defaults when configuring a permission record for the *root* user on host *venus*:

```
        Add or Change Client Host Access to this Server


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                  [Entry Fields]
* Hostname of client system                      titanic
        If all: Hosts to deny access             []                      +
* User name to allow                              all
        If all: Users to deny access             []                      +
  Tape or Virtual Devices for backups or "all"   []                      +
  Directory path for backup images               []                      +
  Directory path for network install images      []                      +

  FIREWALL ENABLEMENT OPTIONS:
  Communication Ports                            []
  Change communication port values?             yes                     +




F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 65. The defaults When Configuring a Permission Record

4. The fields on the above screen have the following meanings. You can change the fields specified.

Hostname of client system

The hostname entered in the prior screen. You cannot change this field from this screen.

If all: Hosts to deny access

Default=(blank/none). If you selected to add or change the record for "all" hosts, enter a list of hosts, separated by spaces, that are to be explicitly denied access. In other words, all hosts except those specified, will be permitted. When you deny access to a specific host, all users on that host are also denied access.

User name to allow

The user name entered in the prior screen. You cannot change this field from this screen.

If all: Users to deny access

If you selected to add or change the record for "all" users, enter a list of users, separated by spaces, that are to be explicitly denied access. In other words, all users *except* those specified will have access.

If you selected to add or change the record for "all" hosts, the users entered are denied from all hosts. Otherwise, the users entered are denied only from the selected host.

Tape or Virtual Devices for backups or "all"

Default=(blank/none). If the specified user is allowed to back up to a tape drive or virtual device, enter the device name or name, separated by spaces. Press F4 to list the available tape and virtual devices on the system and select one or more devices from the list using F7.

Only the devices entered here are displayed on the SMIT menus when the selected host and user performs a backup to this server.

Directory path for backup images

Default=(blank/none). If you want to allow the specified user to perform backups to *disk image files*, enter the directory or directories, separated by spaces, that the user can back up to. Press F4 to display a list of backup image directories already selected, or the default directory of **/usr/lpp/sysback/bf/local/username.** Highlight each entry you want to save and press F7. Press Enter to continue.

When performing any SysBack backup, you provided a directory backup option for each directory specified. The actual file created in the directory is named according to the information in Chapter 2, "SMIT Overview," on page 5.

Directory path for network install images

Default=(blank/none). This field applies only to the "root" user, because only the root user can create a system backup. Enter information in this field only when configuring the "root" user or "all" users if root is not specifically defined.

Enter each directory for which you want to save installation images, each separated by space. Press the F4 key to display a list of installation image directories already selected, or the default directory of **/usr/lpp/sysback/images/local**. Highlight each entry you want to save and press F7. Press Enter to continue.

Note:

When performing the option to **Backup the System**, you are provided a directory backup option for each directory specified. Also, when this

or other systems attempt to perform a network installation, all backup images in the specified directories that the client system has permission to read are displayed as network install options.

Communication Ports

Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this option, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must to be specified in one of the following ways:

- As a comma separated list of ports. For example: 1670, 1671

  Note: You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.

- As a range of ports. For example: 1670-1700.

The port values will be stored in the **/usr/lpp/sysback/ .clientfirewallopts** file.

Change Communication Port Values?

Specify this option when you are modifying the information for the indicated host but do not want the previously configured firewall communication ports to be updated or removed.

5. Press Enter to complete this process. Repeat the above steps for each host and user.

Listing Client Access

The **List Client Access** option displays a list of all host and user permission records. The list includes hosts permitted and denied and users permitted and denied for each host. The devices or directories that each host and user are permitted to access are also displayed.

To list the client host access, select **List Client Access** from the Server Options menu. From a command line, you can list host access by typing `smit sb_lsremaccess`.

The list is displayed with no further prompts.

Removing Client Access

Use the **Remove Client Access** option to remove permission records defined in the **Add or Change Client Host Access to this Server** option.

Removing a specific host's permission records does not automatically deny that host access if there is also a permission record defined for "all" hosts. Likewise, if you remove a record containing a list of users to allow, those users are not necessarily denied access if there is also another record for "all" users. If a record exists for "all" hosts and you want to deny access to a specific host, you must remove the host permission record, if any, and then add that host name to the list of hosts to deny using the **Add or Change Client Host Access to this Server** option.

To remove a client permission record:

1. From the Server Options menu, select **Remove Client Access**.

   Note: From a command line, type `smit sb_ucfgremaccess`.

   A list of hosts with permission records currently defined is displayed.

2. Select a host from the list. If a record exists for "all" hosts, an option for "all" is also shown. If you select to remove the record for "all" hosts, all hosts except those with permission records explicitly defined for them are denied access.

3. After selecting the client host name, a list of users with records defined for that host is displayed. Select a user name, or "all" from the list to remove the selected record.

4. Confirm your choice when asked to do so. This removes the selected permission record from the file with no further prompts.

Adding or Changing the List of Remote Backup Servers

After a backup server has enabled access to a client host using the option **Add or Change Client Host Access to this Server**, the client must identify the servers for which backup options are to be displayed. Only backup options for backup servers defined using this option are displayed when selecting to perform a backup, list, verify or restore operation from SMIT.

To add a remote backup server on the client host:

1. From the Client Options menu, select **Add or Change List of Remote Backup Servers**.

   Note: From the command line, type `smit sb_cfgremserver`.

2. The following screen is displayed:

```
                 Add or Change list of Remote Backup Servers


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                          [Entry Fields]
* Hostname of server                      [kong]                +
  Show disk image file backup/restore options?    no           +


  FIREWALL ENABLEMENT OPTIONS:
  Communication Ports                     []
  Change communication port values?       yes                   +





F1=Help            F2=Refresh       F3=Cancel          F4=List
F5=Reset           F6=Command       F7=Edit            F8=Image
F9=Shell           F10=Exit         Enter=Do
```

Figure 66. The Add or Change List of Remote Backup Servers Menu

You can change the following fields on this screen:

Hostname of server
Default=(none/blank). Enter the name of the server to be provided a backup option or press F4 to list the servers previously added and

select a server from the list. You can use either the full domain name or just the hostname, as long as the hostname can be resolved by itself.

Show disk image file backup/restore options?
Default=no. With this value set to "no", no disk image file backup options are displayed for this server. Set this field to "yes" to display disk file options on the server, but the server must have defined one or more directories that are accessible by this client. You are provided a directory backup option for each directory defined on the server.

Even though the server has a directory defined for this host, you might not want to present a backup option. In this case, set this field to "no" and no options are displayed.

Communication Ports
Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this option, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must to be specified in one of the following ways:
- As a comma separated list of ports. For example: 1670, 1671

  Note: You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.
- As a range of ports. For example: 1670-1700.

  The port values will be stored in the **/usr/lpp/sysback/ .serverfirewallopts** file.

Change Communication Port Values?
Specify this option when you are modifying the information for the indicated host but do not want the previously configured firewall communication ports to be updated or removed.

3. Press Enter to define this server. You receive an appropriate error message if the server has not yet provided access to this client. When the server is defined, all future backup, list, verify and restore options will provide one or more selections for this server, depending on the number of devices or directories defined for this client.

Listing Remote Backup Servers

This option displays a list of all servers currently defined to this client. This list includes devices and directories accessible to this client, as defined on the server. To list the remote servers and accessible devices and directories, select **List Remote Backup Servers** from the Client Options menu or type `smit sb_lsremserver` at a command line.

The list is displayed with no further prompts.

Changing Remote Access Checking

When doing a backup/restore/verify/recreate using the SMIT interface, and a tape server is down or the network is down, it will cause the SMIT menus to hang or appear to hang waiting on a time out to occur. This feature would disable the remote access checking performed, allowing you to create local backups, or backups to a different remote server, without having SMIT hang. Once disabled, this server remains disabled until you enable it again. However, it does not require that you remove the backup server and it's associated attributes as was previously required to resolve this problem. By default, all backup servers configured by SysBack **Remote Services** are enabled and remain enabled until you specifically disable them.

From the Client Options menu, select **Change Remote Access Checking**.

Note: From the command line, type `smit sb_disableremserver`.

The following screen is displayed:

```
                 Change Remote Access Checking


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                            [Entry Fields]
* Hostname of server (or all)               [kong]                 +
  Enable/Disable Remote Access Checking      Enable                +











F1=Help            F2=Refresh        F3=Cancel         F4=List
F5=Reset           F6=Command        F7=Edit           F8=Image
F9=Shell           F10=Exit          Enter=Do
```

Figure 67. The Change Remote Access Checking Menu

You can change the following fields on this screen:

Hostname of server (or all)
> Enter the name of the server to be enabled or disabled press F4 to list the servers previously configured as remote backup servers and select a server

from the list. You can use either the full domain name or just the hostname, as long as the hostname can be resolved by itself. You may also specify the word ALL to indicate that you would like this action to be performed against all previously defined backup servers.

Enable/Disable Remote Access Checking
Specify to enable or disable the hostname of the system referenced by the **Hostname of server (or all)** field.

Removing a Remote Backup Server

Use the **Remove a Remote Backup Server** option to remove servers defined using the **Add or Change List of Remote Backup Servers** option.

Removing a server from this list does not deny future access to this client, but only prevents remote backup options for this server from appearing on the SMIT menus when you select backup, list, verify, or restore options.

To remove a server from the client:

1. From the Client Options menu, select **Remove a Remote Backup Server**.

   Note: From the command line, type smit sb_ucfgremserver.
2. Select a server from the list of server hostnames currently defined.
3. Confirm your choice when asked to do so. This removes the selected server from the list.

Configuring Firewall Port Options - Server to Client

By default, when SysBack initiates remote communications with another host, it attempts to utilize network ports 1239, 1022, and 1023 depending on the particular communication activity.

If these ports are not available, SysBack will begin looking for a free port in the in a descending manner until reaching port 512. If there are no free ports in the range, then the process will fail.

To define specific ports for use in environments with fire walls:

1. From the Firewall Port Options menu, select either **Server to Client Firewall Ports** or **Client to Server Firewall Ports**, depending on which you are configuring.
2. Refer to either "Add or Change Server to Client Firewall Ports" on page 139 or "Add or Change Client to Server Firewall Ports" on page 141 for details on configuring firewall port options.

You must perform the above steps for each system that you want to use specific ports for SysBack communications. Otherwise, SysBack will use its default method of port selection which could yield the utilizations of different ports each time a process is initiated.

List Server to Client Firewall Ports

This option displays a list of all previously defined network ports for clients currently defined to this server by SysBack. To list the defined ports by client hostname, select **List Server to Client Firewall Ports** from the Server to Client Firewall Ports menu.

Note: This will not list client hostnames that have not specifically been configured to use particular network ports. If there is no definition for a client hostname, the default SysBack port determination method is used.

The list is displayed with no further prompts. See an example of the output from this operation in the following example:

```
                          COMMAND STATUS

Command: OK            stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

Server to Client Firewall options
--------------------------------

Host: jennCLIENT1
      FIRE WALL PORT LIST:
      1030    1031
----------------------------------------------------------

F1=Help             F2=Refresh        F3=Cancel         F6=Command
F8=Image            F9=Shell          F10=Exit          /=Find
n=Find Next
```

Figure 68. Output from List Server to Client Firewall Ports

Add or Change Server to Client Firewall Ports

Use the Add or Change Server to Client Firewall Ports menu to define which ports that this server host should attempt to contact on the defined client hostname.

```
            Add or Change Server to Client Firewall Ports

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                        [Entry Fields]
* Hostname of Client                    [myCLIENT2]              +
  Communication Ports                   []


F1=Help             F2=Refresh        F3=Cancel         F4=List
Esc+5=Reset         F6=Command        F7=Edit           F8=Image
F9=Shell            F10=Exit          Enter=Do
```

Figure 69. Add or Change Server to Client Firewall Options

You can change the following fields on this screen:

Hostname of Client

Enter the name of the client for which you would like to define specific ports for SysBack to use when contacting it. Press F4 to list the clients previously configured and then select a client from the list. You can use either the full domain name or just the hostname, as long as the hostname can be resolved by itself. You may also specify the word ALL to indicate that you would like this action to be performed against all defined clients.

Communication Ports

Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this option, SysBack will use its default method to determine open communication ports. However,

should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

> **Note:** Ports must to be specified in one of the following ways:
> - As a comma separated list of ports. For example: 1670, 1671
>
>   > **Note:** You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.
> - As a range of ports. For example: 1670-1700.

The port values will be stored in the **/usr/lpp/sysback/.clientfirewallopts** file.

Remove Server to Client Firewall Ports

Use the **Remove Server to Client Firewall Ports** option to remove client host communications defined using the **Add or Change Server to Client Firewall Ports** option.

Removing a client host from this list does not deny future access to this client, but only removes the requirement to use the previously specified communication ports. Once this entry is removed, communications with the client host will occur using SysBack default communication ports.

To remove a server from the client:

1. From the Server to Client Firewall Ports menu, select **Remove Server to Client Firewall Ports**.
2. Select a client from the list of client host names currently defined.
3. Confirm your choice when asked to do so. This removes the selected client definition from the list.

Configuring Firewall Port Options - Client to Server

From the Firewall Port Options menu, select **Client to Server Firewall Options**.

List Client to Server Firewall Ports

This option displays a list of all previously defined network ports for servers currently defined to this client by SysBack. To list the defined ports by server hostname, select **List Client to Server Firewall Ports** from the Client to Server Firewall Ports menu.

> **Note:** This will not list server hostnames that have not specifically been configured to use particular network ports. If there is no definition for a server hostname, the default SysBack port determination method is used.

The list is displayed with no further prompts. See an example of the output from this operation in the following example:

```
                          COMMAND STATUS

Command: OK            stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

Client to Server Firewall options
--------------------------------

Host: jennSVR1
        FIRE WALL PORT LIST:
        1030    1031
-----------------------------------------------------------

F1=Help            F2=Refresh        F3=Cancel        F6=Command
F8=Image           F9=Shell          F10=Exit         /=Find
n=Find Next
```

Figure 70. Output from List Client to Server Firewall Ports

Add or Change Client to Server Firewall Ports

Use the Add or Change Client to Server Firewall Ports menu to define which ports that this client should attempt to contact on the defined server hostname.

```
            Add or Change Client to Server Firewall Ports

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                          [Entry Fields]
* Hostname of Server                      [jennSRV2]          +
  Communication Ports                     []




F1=Help            F2=Refresh        F3=Cancel        F4=List
Esc+5=Reset        F6=Command        F7=Edit          F8=Image
F9=Shell           F10=Exit          Enter=Do
```

Figure 71. Add or Change Client to Server Firewall Ports

You can change the following fields on this screen:

Hostname of Server
> Enter the name of the server for which you would like to define specific ports for SysBack to use when contacting it. Press F4 to list the servers previously configured and then select a server from the list. You can use either the full domain name or just the hostname, as long as the hostname can be resolved by itself. You may also specify the word ALL to indicate that you would like this action to be performed against all defined servers.

Communication Ports
> Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this option, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

> **Note:** Ports must to be specified in one of the following ways:
> - As a comma separated list of ports. For example: 1670, 1671

> **Note:** You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.

- As a range of ports. For example: 1670-1700.

The port values will be stored in the **/usr/lpp/sysback/.serverfirewallopts** file.

Remove Client to Server Firewall Ports

Use the **Remove Client to Server Firewall Ports** option to remove server host communications defined using the **Add or Change Client to Server Firewall Ports** option.

Removing a server host from this list does not deny future access to this server, but only removes the requirement to use the previously specified communication ports. Once this entry is removed, communications with the server host will occur using SysBack default communication ports.

To remove a server from the client:

1. From the **Client to Server Firewall Ports** menu, select **Remove Client to Server Firewall Ports**.
2. Select a server from the list of server hostnames currently defined.
3. Confirm your choice when asked to do so. This removes the selected server definition from the list.

Remote Commands Access for use with Pull Backups

The **Remote Command Access Options** are used to configure a backup client to allow another host to remotely initiate backups (also called a "pull backup."

For example, the **initiator server** contacts the **backup client** to start the backup. In response, the client initiates the backup and sends data to the **data destination server**. The initiator server is actually "pulling" the backup operation from the client instead of the backup client "pushing" the backup operation directly to the data destination server.

Using pull backups lets you initiate and control backup operations from a single location. You may also automate this backup management using the SysBack Scheduling and Scripting functions described in Chapter 22, "Scheduled Backups and Scripts," on page 329.

Pull backups require two types of remote configuration: **Remote Services Configuration** and **Remote Command Access Configuration**. The Remote Services Configuration enables communication and allow the backup client to send data across the network to the data destination server. Remote Services also enables communications between the initiator server and the backup client and in some cases, between the initiator server and the data destination server. The Remote Command Access allows the backup client to grant permission to the initiator server to start the pull backup.

The host that initiates the pull backup does not need to be the same host where the backup data is sent. For example, you can configure Remote Service between Machine A, the backup client, and Machine B, the data destination server receiving

the backup. Also you would need to configure Remote Command Access between Machine A, the backup client, and Machine C, the backup initiation server.

To configure Remote Command Access:

1. Configure Remote Services between the backup client and the data destination server. Refer to "Configure Remote Services" on page 131, "Adding or Changing Client Host Access to This Server" on page 131, and "Adding or Changing the List of Remote Backup Servers" on page 135 for details.

2. Configure Remote Services between the backup client and the initiator server. Refer to "Configure Remote Services" on page 131 for details.

3. Optionally configure the data destination server as a backup client to the initiator server. This will allow you to view the device options available on the data destination system when initiating a Pull Backup via SMIT menus. Refer to "Configure Remote Services" on page 131, "Adding or Changing Client Host Access to This Server" on page 131, and "Adding or Changing the List of Remote Backup Servers" on page 135 for details.

4. On the backup client, select **Remote Command Access** from the Configuration Options menu.

   Note: From a command line, type `smit sb_access`.

5. On the backup client, select the **Configure Remote Services** option from the Remote Command Access Menu to configure remote services between the backup client and the initiator server if you have not previously done so in an earlier step.

   Note: From a command line, type `smit sb_cfgremsvs`.

6. Press Enter at the `Are you sure?` prompt.

7. On the backup client, select **Add or Change Remote Command Access**.

   Note: From a command line, type `smit sb_accessadd`.

8. Type the fully qualified path name to the desired backup command. The SysBack backup commands are located in Appendix A, "Commands," on page 351, or you may determine the command by pressing F6 when in a backup menu.

   Note: All SysBack backup commands are located in `/usr/sbin`.

9. Enter the fully qualified DNS names of the server system, or systems, that will act as initiator server to start the backup in the "Hostname of Server System(s)"field. If you are specifying multiple hosts for which to grant access, you should enter them as a space separated list.

10. If the hostname specified is "all," optionally input any host systems to specifically deny initiator server access at the "If all: Host(s) to deny access" prompt.

11. Press Enter to confirm your selections.

Special Notes About Remote Command Access in Environments with Fire Walls

Configuring firewall port options for use with pull backups requires a basic understanding of how pull backups operate.

For communications between the initiator system and the backup client system do the following:

1. From the initiator server, configure **Server to Client Firewall Ports** as described in "Add or Change Server to Client Firewall Ports" on page 139 for the backup client's hostname.
2. From the backup client, configure **Client to Server Firewall Ports** as described in "Add or Change Client to Server Firewall Ports" on page 141 for the initiator server's hostname.

For communications between the backup client and the data destination server do the following:

1. From the data destination server, configure **Server to Client Firewall Ports** as described in "Add or Change Server to Client Firewall Ports" on page 139 for the backup client's hostname.
2. From the backup client, configure **Client to Server Firewall Ports** as described in "Add or Change Client to Server Firewall Ports" on page 141 for the data destination server's hostname.

For communications between the initiator server and the data destination server do the following:

1. From the initiator server, configure **Client to Server Firewall Ports** as described in "Add or Change Client to Server Firewall Ports" on page 141 for the data destination server's hostname.
2. From the data destination server, configure **Server to Client Firewall Ports** as described in "Add or Change Server to Client Firewall Ports" on page 139 for the backup client's hostname.

Configuring Remote Services in an NIS Environment

When working in an NIS environment, you should always configure Remote Services (which creates the user sbnet) on the NIS Master before configuring it on any NIS Slaves. This is because the Master could propagate the updated user and password files to the Slaves in such an order as to nullify the creation of the sbnet user on the Slave after the setup of Remote Services is completed. This could be an inconvenience to figure out when the remote backups from the client fail. The correct order to configure Remote Services are:

1. Configure Remote Services on the NIS Master.

   Note: For details, refer to section "Configure Remote Services" on page 131.
2. Configure Remote Services on NIS Slaves.

   Note: For details, refer to section "Configure Remote Services" on page 131.
3. ConfigureSysBack Remote Service to allow SysBack client access

   Note: For details, refer to section "Adding or Changing the List of Remote Backup Servers" on page 135.
4. Configure SysBack clients with definitions for the desired remote backup servers.

   Note: For details, refer to section "Adding or Changing the List of Remote Backup Servers" on page 135.

Chapter 11. Exclude Lists

You might want to exclude certain files, directories, file systems or logical volumes from a backup to reduce the time needed to make the backup and the amount of space on the backup media. If, for instance, you have a directory that contains only temporary files that are recreated each time an application is started, those files might be excluded from the backup to save time and space. Another example might be read-only data files, used by an application, that never change. In the case of a system failure, it might be easier to reinstall those data files from another more stationary backup than to include the data on a daily backup.

You can exclude a single file, a directory (and all files beneath that directory), a file system, or a logical volume from all SysBack backups.

Note: If a directory name is excluded, all files below that directory are also excluded. This includes any files that might be required for the system to operate properly and might parse into different file systems. Use discretion when excluding directories to prevent the creation of a system backup that cannot be used as system installation media.

You cannot use the following characters in the exclude list because they have special meaning to some AIX commands:

$
*
+
?
^

Although some of these characters can be used in a file or directory name in AIX, those files or directories cannot be properly excluded when entered in the exclude list. Only the asterisk (*) character can be used in the exclude list, but this character represents a *wildcard*, allowing groups of files or directories with similar names to be excluded.

The following are examples of using wild cards in the exclude list:

/*test*	All files in the system containing the word "test".
/*old	All files on the system ending with "old".
/home/b*	All files under /home starting with a "b".
/home/t*y	All files under /home starting with "t" and ending with "y".
/tmp	All files under /tmp will be excluded. Also, and the permissions and extended ACLs of the mount point will not be preserved. The file system mount point can still recreated however.
/tmp/*	All files under /tmp will be excluded. The permissions and extended ACLs of the mount point will be preserved. The file system mount point can also recreated.

Note that any entry starting with "/*" includes all directories on the system, not just the root (/) directory.

To access the SysBack menus for managing the exclude lists:

1. At a command line, type `smit`.
2. Select **IBM Tivoli Storage Manager for System Backup and Recovery**.
3. Select **Configuration Options**.
4. Select **Exclude Lists**.

You can also access these menus using the fastpath. To do this, type `smitty sb_exclude` at a command line.

```
                         Exclude Lists

Move cursor to desired item and press Enter.

  Add a File, Directory, or Logical Volume to Exclude List
  Display Current Exclude List
  Remove Entries from Exclude List
  Delete Exclude List File




F1=Help            F2=Refresh         F3=Cancel          F8=Image
F9=Shell           F10=Exit           Enter=Do
```
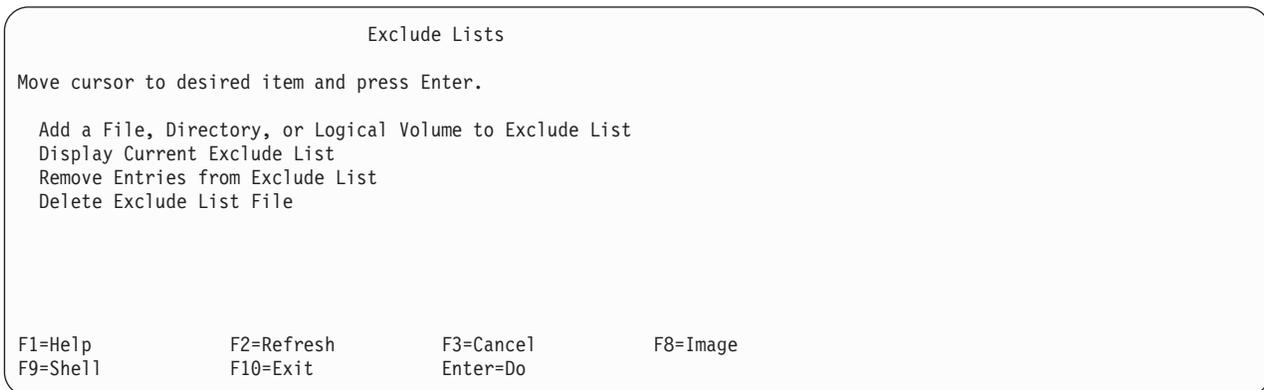
Figure 72. The Exclude Lists Menu

Adding a File, Directory or Logical Volume to an Exclude List

To add a file, directory or logical volume to the exclude list, thereby excluding this data from all SysBack backups:

1. From the Exclude Lists menu, select **Add a File, Directory, or Logical Volume to Exclude**.

   Note: From the command line, type `smitty sb_mkexclude`.

   The following screen is displayed:

```
          Add a File, Directory, or Logical Volume to Exclude List


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                          [Entry Fields]
  Exclude List File Name                      []
        Default file is /usr/lpp/sysback/.exclude_list
  File or directory name to add               [/tmp]
      OR
  Logical Volume name to add                  []




F1=Help           F2=Refresh         F3=Cancel          F4=List
F5=Reset          F6=Command         F7=Edit            F8=Image
F9=Shell          F10=Exit           Enter=Do
```
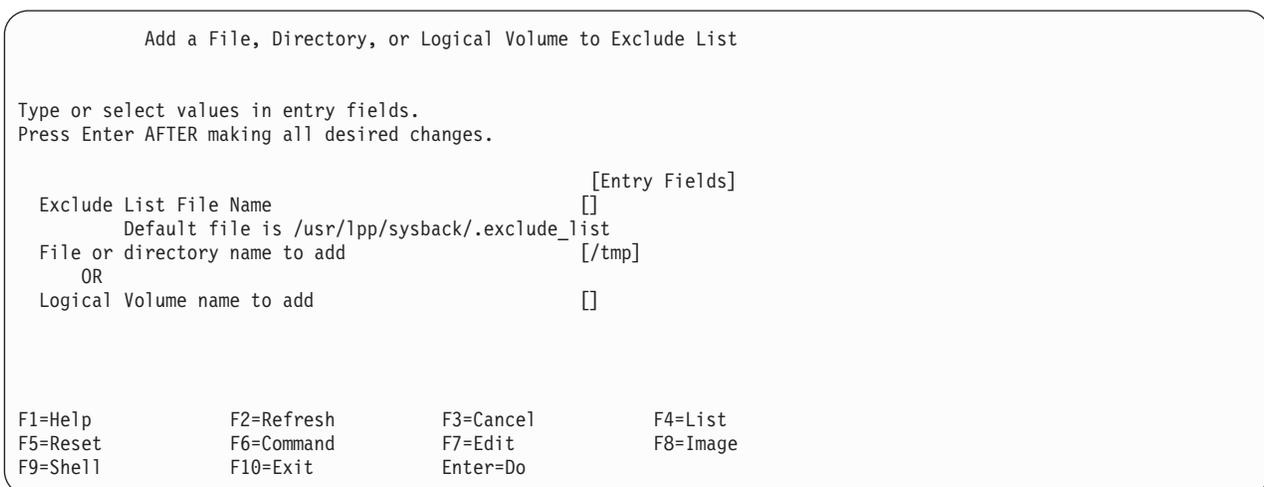
Figure 73. The Add a File, Directory, or Logical Volume to Exclude List Menu

2. Enter data into one of the following fields:

   Exclude List File Name
   Specify the fully qualified path and file name to use as the exclude list.

If this field is left blank, the excluded entries will be placed in the
default exclude list located at: **/usr/lpp/sysback/.exclude_list**.

File or directory name to add
Default=(blank/none). Enter a filename or directory name to add to the
exclude list. The file or directory name must begin with a slash (/), and
can contain wildcard (*) characters. If you enter a filename, only that
file is excluded. If you enter a directory name, all files and directories
within the specified directory are excluded.

If you enter a file system mount point for the directory, the entire file
system is excluded from the backup. This will not, however, prevent
the file system from being recreated from backups without restoring the
data.

Logical Volume name to add
Default=(blank/none). Enter the name of a logical volume to exclude
from system and volume group backups. If specified, the logical
volume data is not included in the backup, but you can recreate the
logical volume from the backup without restoring the data. Enter the
logical volume name in the form of /dev/lv00.

3. Press Enter to accept the entries. You must repeat the above steps for each file,
   directory, or logical volume you want to exclude.

If you prefer, you may create your exclude list directly using the editor of your
choice. There should only be one exclude entry per line. When entering logical
volumes in this manner, they should be listed as @lvname. For example, /dev/lv00
would be entered in the exclude list file as @lv00.

Below are the contents of a sample exclude list file:

```
root@lasher /usr/lpp/sysback>more .exclude_list
@lv00
@sblv
/lasher/data
/home/*
/tmp/*test*
```

Listing Excluded Files or Directories

To list all of the files, directories or logical volumes currently excluded from
SysBack backups, select **Display Current Exclude List** from the **Exclude Lists**
menu. You will be prompted for an exclude list file name to display. Enter the fully
qualified path and file name to the file to display. If no file name is specified, the
/usr/lpp/sysback/.exclude_list file will be displayed. All of the files, directories or
logical volumes currently excluded from SysBack backups are listed for the
specified file.

Removing Files or Directories from an Exclude List

To remove individual files, directories or logical volumes previously added to the
exclude list:

1. From the **Exclude Lists** menu, select **Remove Entries from Exclude List**.

   Note: From the command line, type `smitty sb_rmexclude`.

   The following screen is displayed:

```
          Remove Entries from an Exclude List


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                      [Entry Fields]
  Exclude List File Name                   []
        Default file is /usr/lpp/sysback/.exclude_list
  File or directory name to add                [/tmp]
     OR
  Logical Volume name to add               []




F1=Help          F2=Refresh       F3=Cancel        F4=List
F5=Reset         F6=Command       F7=Edit          F8=Imag
F9=Shell         F10=Exit         Enter=Do
```

Figure 74. The Remove Entries from Exclude List Menu

2. Enter data into one of the following fields:

   Exclude List File Name
   Specify the fully qualified path and file name to use as the exclude list.
   If this field is left blank, the excluded entries will be placed in the
   default exclude list located at: **/usr/lpp/sysback/.exclude_list**.

   File or directory name to remove
   Default=blank. Enter the full path name of a file or directory to remove
   or press F4 to list all currently excluded files and directories and select
   from the list.

   Logical Volume name to remove
   Default=(blank/none). Enter the name of a logical volume to remove
   from the exclude list or press F4 to display a list of previously excluded
   logical volumes and select from the list.

3. Press Enter. Any files, directories or logical volumes removed from the exclude
   list are now included in all future SysBack backups.

Deleting an Exclude List File

To delete an entire exclude list file:

1. From the **Exclude Lists** menu, select **Delete Exclude List File**.

   Note: From the command line, type `smitty sb_rmexclude_file`.

```
           Remove Exclude List File


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                [Entry Fields]
Exclude List File Name                          []



F1=Help           F2=Refresh        F3=Cancel        F4=List
F5=Reset          F6=Command        F7=Edit          F8=Image
F9=Shell          F10=Exit          Enter=Do
```

Figure 75. The Remove Entries from Exclude List Menu

2. Enter data into one of the following fields:

Exclude List File Name
Specify the fully qualified path and file name to use as the exclude list. Unlike the other exclude list options, you may not leave this field left blank. You must explicitly specify the default exclude list located at: **/usr/lpp/sysback/.exclude_list** if you would like to remove it.

3. Press Enter.

Chapter 12. Recreating or Restoring from Backups

There are many reasons to restore data from a backup. The data might have been corrupted due to improper user input or application errors, or the data might be inaccessible due to various hardware problems.

If data was inadvertently deleted or corrupted by a user or application, you will probably need to restore the data from the backup. If a hardware failure occurred, you need to perform additional steps before you can restore the data. For instance, if a disk failure occurs that makes a volume group inaccessible, it will probably be necessary to delete and recreate the volume group, recreate the file systems and logical volumes, and mount the file systems, before the data can be restored. Any SysBack backup type can be used in this process, but the backup must contain the desired data, as well as the desired system information, to recreate or restore the desired data.

Note: This section does not describe the process for reinstalling the system, only recreating and restoring data onto an already active system. For information on reinstalling the system from a system backup, refer to Chapter 14, "System Installation and Maintenance," on page 185.

Removing Volume Groups, Logical Volumes, and File Systems

Before any volume group, logical volume, or file system can be recreated on an active system, you must remove the old volume group, logical volume, or file system. This process is not detailed within this manual because the steps vary too widely depending on the reason for the recreation process. For detailed assistance on any of these activities, contact your preferred AIX Technical Support Organization. The following guidelines might help in deleting the old system information:

- **Volume Group:** To delete a volume group, first refer to the information below on how to make file systems and logical volumes inactive. Then, use the AIX **varyoffvg** command to make the volume group inactive and the **exportvg** command to remove the volume group information from the system configuration database.
- **File Systems:** To delete a file system, the file system must be unmounted, even if the file system is currently inaccessible. You can do this with the AIX **umount** command. To use this command, no user can currently be changed to (**cd** command) any directory within the file system, and no process on the system can have any file in the file system open.

  If you are removing the volume group containing this file system, the file system will be removed when the volume group is exported. However, to remove only a select file system, first unmount the file system, then use the AIX **rmfs** command to remove it.
- **Logical Volumes:** To delete a logical volume, no process can have the logical volume open. Certain logical volumes used by the system are normally open by system processes, and the steps to make them inactive vary depending on the logical volume type. To list the logical volumes for a volume group, use the

  ```
  lsvg -l VGname
  ```

  command. This command also shows the logical volume type and whether the logical volume is currently opened (active).

The following information should be helpful for making the logical volume inactive based on its type:

jfs
This is the default logical volume. jfs indicates the logical volume is used for a journaled file system. If this is the case, refer to the instructions above for File systems. Otherwise, an unknown process on the system has the logical volume open.

jfslog
This is a logical volume used by file systems in the volume group. This logical volume is made inactive automatically when all of the file systems that reference it are unmounted. View the **/etc/filesystems** file to see which file systems reference which jfslog logical volumes.

paging
This logical volume is a paging space. An active paging space cannot be disabled as long as the system is running. Instead, you must deactivate the paging space for the next system boot using the command **chps -an LVname**. After doing so, the system must be rebooted for the paging space to be inactive.

dump
This logical volume is used for a system crash dump and is referred to as the dump device. You must disable the system dump to make this logical volume inactive. To do so, execute the command **sysdumpdev -Pp /dev/sysdumpnull** and **sysdumpdev -Ps /dev/sysdumpnull**.

Any other logical volume types are user-defined and have no specific meaning to the system.

If you are removing the entire volume group containing the logical volumes, the logical volumes are removed along with the volume group information. If, however, you are only removing the logical volumes, use the **rmlv** command to remove the logical volumes once they are inactive.

Recreating Volume Groups, Logical Volumes, and File Systems

If you experience a hardware failure that requires you to recreate a volume group, logical volume, or file system, you can use either the system or volume group backup. A file system backup can also be used to recreate file systems while a logical volume backup can be used to recreate logical volumes. These "containers" must be recreated to provide a place to restore the data.

You can recreate one or more volume groups, logical volumes or file systems as they are defined on the backup, or you can optionally change the volume group, logical volume or file system characteristics, including the disk location, file system and logical volume sizes, or any other attribute.

Note: The containers you want to recreate must have information pertaining to them on the backup media. A volume group backup of only the vg00 volume group cannot be used to recreate any other volume group. However, this backup can be used to recreate single logical volumes or file systems that were contained within volume group vg00. The system backup, however, always contains information about all volume groups, logical volumes, and file systems, even if not all volume group data was included on the backup.

You do not have to use the backup media to recreate a volume group, logical volume or file system on the same system. You can use the media to perform the recreation on another system, thereby copying an environment from one system to another.

Note: By default, this option recreates the volume group, logical volume, and file system structures but does not restore the data into them. You may optionally choose to restore the data with this option, or you may use the **Restore Data from a Backup** option separately.

To recreate one or more volume groups, logical volumes, or file systems:

1. At a command line, type `smit`.
2. From the SMIT menu, select **IBM Tivoli Storage Manager for System Backup and Recovery**.
3. Select **Backup & Recovery Options**.
4. Select **Recreate Volume Groups, Logical Volumes or Filesystems**.

   Note: From a command line, type `smit sb_create`.
5. On the Device Selector screen, highlight the device you want to use and press Enter.
6. If you selected a tape drive or virtual device, enter the backup sequence number. The default value is "1", indicating that you want to use the first backup on the media. If you "stacked" multiple sequential backups on the media, and want to use the information from a different backup, enter the backup number and press Enter.

   If you selected a Tivoli Storage Manager virtual device, select the Tivoli Storage Manager Backup ID from the list of backups on the next selector screen.
7. If the backup is a system or volume group backup, select the type of backup you are going to recreate. You have two options:

   ```
   Volume Group (all LVs and filesystems)
   Logical Volume and/or Filesystem
   ```

   Highlight the type of backup you are creating and press Enter.

   If the backup is a File system or Logical Volume Backup, the recreate type is assumed to be "Logical Volume and/or File system."
8. Depending on your response to the previous prompt, select from the displayed list either a volume group or logical volume to create. To select a single option, highlight the option and press Enter. To select multiple options, highlight each option and press F7 to select. When you have made all selections, press Enter to continue.
9. One of the following screens is displayed. These screens are examples of the screens that are displayed when you recreate either a single volume group or two logical volumes from a tape device:

```
                    Recreate a Volume Group from a Backup


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                               [Entry Fields]
  Hostname of Server                          hambone
  Device or file name                         /sysback.images/chukra>
  TSM backup ID
  Edit the Volume Group info before proceeding?    yes                    +
  New Volume Group Name                       []
  Volume Group(s) to create                   [vg00]








F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 76. Recreating a Single Volume Group

```
            Recreate a Logical Volume or Filesystem from a Backup


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                               [Entry Fields]
  Hostname of server                          hambone
  Device or file name                         /sysback.images/chukra>
  TSM backup ID
  Restore Filesystem Mountpoint Permissions   yes
  Edit the Logical Volume info before proceeding?  yes                    +
  New Volume Group Name                       []
  Logical Volume(s) to create                 [lv01]
```

Figure 77. Recreating a Two Logical Volumes from a Tape Device

The following is an explanation of each field:

Hostname of Server
> The server hostname if a server option was selected on the prior device selector screen. You cannot change this field.

Device or file name
> The device or disk image file name previously selected. You cannot change this field on this screen.

TSM Backup ID
> This option will only be displayed when the **Device or file name** is a Tivoli Storage Manager virtual device. The value for this field is propagated from a previous input screen and may not be changed.

Edit the Logical Volume info before proceeding?
> Default=yes. This prompt is displayed only when selecting to recreate logical volumes or file systems. If you want to view or change the logical volume or file system information, such as the disk locations, sizes, or other attributes, before recreating the logical volumes and file

systems, keep the default value of "yes." Otherwise, to recreate the logical volumes or file systems without viewing or changing the information, press Tab to change the value to "no."

Restore Filesystem Mount point Permissions
Default=no. Specify "yes" if you would like to restore the file system permissions from the backup image when the file system is recreated.

Edit the Volume Group info before proceeding?
Default=yes. This prompt is displayed only when selecting to recreate volume groups. If you want to view or change the volume group, logical volume, or file system information, such as the disk locations, sizes, or other attributes, before recreating the volume group and its logical volumes and file systems, keep the default value of "yes." Otherwise, to recreate the volume group, logical volumes or file systems without viewing or changing the information, press Tab to change the value to "no."

New Volume Group Name
Default=(blank/none). If you are recreating a volume group, you can enter a new volume group name in this field. This is particularly useful if you want to recreate a volume group but the original volume group by the same name still exists on the system. You can not enter a value in this field if you are creating more than one volume group at one time.

> **Note:** Specify the logical volume name in the form of "lvname" and not "/dev/lvname".

If you are recreating one or more logical volumes, entering a value in this field indicates that the logical volumes to be created will be placed in the specified volume group. In this case, the volume group name you enter must be an active volume group on the system.

New Logical Volume Name
Default=(blank/none). If you are recreating a logical volume, you can enter a new logical volume name in this field. This is particularly useful if you want to recreate a logical volume but the original logical volume by the same name still exists on the system. You can not enter a value in this field if you are creating more than one logical volume at one time.

If you are recreating one or more logical volumes, entering a value in this field indicates that the logical volumes to be created will be placed in the specified volume group. In this case, the volume group name you enter must be an active volume group on the system.

Restore filesystem permissions?
Default=No. Specify "yes"to this option if you would like the permissions of this file system restored from the backup during the process to recreate the structure.

Logical Volume(s) to create
This field is displayed only when selecting to recreate logical volumes and file systems. This field will contain the names of the logical volumes selected on the prior selection screen. You can change the logical volumes to create by adding or removing entries from this list, separating each entry by a space.

Although only the logical volume name is indicated here, if the logical volume contains a file system, the file system will be recreated.

Note that information regarding the logical volumes to recreate must be contained on the backup media previously selected.

Volume Group(s) to create

This field is displayed only when selecting to recreate volume groups. This field will contain the names of the volume groups selected on the prior selection screen. You can change the volume groups to create by adding or removing entries from this list, separating each entry by a space. Note that information regarding the volume groups to recreate must be contained on the backup media previously selected.

10. When you have made all selections, press Enter to begin.

The media is read to obtain the information on the volume groups, logical volumes or file systems selected.

If you selected to edit the volume group, logical volume or file system information, a screen similar to the following is displayed:

```
        +----------------------------------------------------------+
        |      Change Volume Group & Logical Volume Information     |
        +----------------------------------------------------------+



               Select Physical Volumes for Volume Groups

                    Change Volume Group Attributes

              Select Physical Volumes for Logical Volumes

                    Change Logical Volume Attributes

                     Change Filesystem Attributes



 +--------------------------------------------------------------------+
 | Select this option to change the physical volumes which are assigned to each |
 | volume group.                                                      |
 +--------------------------------------------------------------------+
 | Use ARROW or Tab keys to move and ENTER to Select. Press ESC for Main Menu.  |
 +--------------------------------------------------------------------+
```

Figure 78. Editing the Volume Group, Logical Volume, or File System Information

The options for volume groups are not displayed when you select to recreate logical volumes. Also, if this is a power backup, the option for changing file system information is not displayed. These menus provide options for changing virtually all attributes for volume groups, logical volumes, and file systems. This process is identical to reinstalling a system from a system backup. In both cases, the detailed steps for changing this information is provided in Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

The volume group, logical volume, and file systems are then checked to ensure that they can be recreated based on the current system resources available. If there are inconsistencies, such as not enough disk space or unassigned physical volumes (disks), the appropriate messages are displayed and you must change the volume group or logical volume information before the process can continue.

If there are no inconsistencies with the new system, you are asked:

```
Are you sure you wish to create the volume group(s) (y/n)?
```

or

```
Are you sure you wish to create the logical volume(s) (y/n)?
```

Answering "y" to this question recreates the volume groups or logical volumes as specified. When the process has completed, you are asked to press Enter to return to the SMIT screen.

Understanding Incremental Restores

If you created incremental backups, then you must understand the process of restoring data from these backups. Examples of planning and performing incremental backups and their corresponding restoration processes are detailed in "Understanding Incremental Backups" on page 19.

An incremental restore requires restoring a volume group or file system to the state of its last full (*level 0*) backup, and then reapplying each subsequent incremental backup level until the volume group or file system is returned to its current state. Because only a *level 0* backup contains all of the data in either the volume group or file system, this backup must be restored before any additional incremental levels can be applied.

Restoring an incremental backup does not only add or change files in a file system, but can also *remove* files from a file system. If a file was removed from the file system between the time a *level 0* and a *level 1* backup was created, the file can be restored during a *level 0* restore, and removed from the system again during a *level 1* restore.

SysBack does not check the order in which the incremental levels are restored. The user must ensure that the incremental backups are restored in the proper order. SysBack requires that the user explicitly indicate that they want to restore an incremental backup. If an attempt is made to restore a volume group or file system from an incremental backup without the user indicating this intent, the restore process does not proceed.

Restoring level 0: When a level 0 backup is restored, the file systems on the system that are to be restored are first cleared of all files. Then, the backup of the file systems is restored. At this point, the file systems have been returned to the exact state at which the level 0 backup was made.

Restoring other levels: After the level 0 backup is applied, the subsequent backup level or levels must be applied to return the file systems to their most recent state. The number of levels to restore differs depending on the design of the incremental backups. The important thing to remember is that the *most recent* of each subsequent level must be applied in the correct order. If, for instance, you performed multiple *level 3* backups, it is only the most recent level 3 that needs to be restored, because the most recent *level 3* backup supersedes all other *level 3* backups.

Before a level (other than 0) is restored, any files that currently exist in the file systems, but did *not* exist at the time the backup level was created, are removed from the file systems.

Restoring individual files or directories: You can restore individual files or directories from any incremental backup level. This is not considered an incremental restore, so it is not necessary to restore a level 0 backup first. If you want to restore the most recent copy of a file, it might be necessary to list the files on each backup level, in reverse order, before finding the file. The file is always included on the level 0 backup (if it existed at that time), but later revisions of the file can be included on any subsequent backup level.

Restoring Data from a Backup

Use the **Restore Data from a Backup** option to restore one or more volume groups, file systems, logical volumes, directories, or regular files from any type of backup created with SysBack.

To restore from a backup:

1. From the Backup & Recovery Options menu, select **Restore Data from a Backup**.

   Note: From the command line, type `smit sb_restore`.

2. On the Device Selector screen, highlight the device you want to use and press Enter.

3. If you selected a tape drive or virtual device, enter the backup sequence number. The default value is "1," indicating that you want to restore data from the first backup on the media. If you "stacked" multiple sequential backups on the media, and want to use the information from a different backup, enter the backup number and press Enter.

   The backup media is then read to determine the backup type.

   If you selected a Tivoli Storage Manager virtual device, select the **Tivoli Storage Manager Backup ID** from the list of backups on the next selector screen.

4. Select the type of data to be restored from the list displayed. The possible choices include:

   - Volume Group (all LVs and file systems)
   - File system
   - All Directories and Files
   - Directory (all files within)
   - Regular File

   Only the options that are valid for the type of backup you are restoring from are displayed. Highlight the type of data you want to restore and press Enter.

5. If you selected volume group, logical volume or file system, select the data to be restored from the list of volume groups, logical volumes, or file system mount points. To select a single option, highlight the option and press Enter. To select multiple options, highlight each option and press F7. When you have made all selections, press Enter to continue.

6. At the "Do you wish to list select files to restore?" prompt, select "yes" for a list of all files contained on the backup media. You can also narrow the list by using a search word or wildcard character. The search word can include the *wildcard* (*) character. SysBack supports the use of BRE (Basic Regular Expression) wild cards to restore a wildcard match of files. The filenames and the wildcard must be enclosed in double quotation marks (″) to avoid expansion by the user's shell.

For example, the search word "/home/j*" indicates to restore all directories and files that start with "/home/j" such as **/home/john** or **/home/jenn**. Another example is the search word "ab*d", which would display the following filenames:

```
/tmp/abcd
/var/spool/abduct
/home/data/aboyandhisdog
```

SMIT limitations prevent a list of files longer than 32768 lines from being displayed. Therefore, the list, if longer, is truncated to this size. However, in some cases, SMIT can not handle the excessive size and will display an error. If this occurs, simply restore to the "Do you wish to list select files to restore?" prompt and select "no"instead. You may then specify either a file containing the list of files to restore, or explicitly enter the file names desired.

If you want to display a file that contains a list of files to restore, select "no"

7. The following figures show the default options and values that are displayed when you restore a file system from a volume group Backup, and regular files from a file system backup:

```
                    Restore Data from a Backup


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                               [Entry Fields]
  Hostname of server                            hambone
  Disk image file                              /sysback.images/chukra>
  TSM backup ID
  Restore data type                            Filesystem
  Report output type                           both                    +
  Device name for remote volume prompt         []
  Allow restore of system data?                 no                     +
  Allow restore of incremental backup?          no                     +
  Recreate VG,LV, or filesystem  before restoring?  no                 +
  Restore non sparse files as non sparse (AIX 5.1 on  no               +
  ly?)
  Destination (if different)                   []
  Exclude List File Name                       []                       +/
   File containing a list of data to be restored   []
  [MORE]




 F1=Help           F2=Refresh       F3=Cancel         F4=List
 F5=Reset          F6=Command       F7=Edit           F8=Image
 F9=Shell          F10=Exit         Enter=Do
```

Figure 79. Default Values When Restoring a File System from a Volume Group Backup

```
                    Restore Data from a Backup


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                           [Entry Fields]
  Hostname of server                        hambone
  Disk image file                           /sysback.images/chukra>
  TSM backup ID
  Restore data type                         Filesystem
  Report output type                        both                   +
  Device name for remote volume prompt      []
  Allow restore of system data?              no                    +
  Allow restore of incremental backup?       no                    +
  Recreate VG,LV, or filesystem  before restoring?   no            +
  Restore non sparse files as non sparse (AIX 5.1 on  no           +
  ly?)
  Destination (if different)                []
  Exclude List File Name                    []                     +/
  File containing a list of data to be restored    []
  [MORE]




F1=Help          F2=Refresh        F3=Cancel        F4=List
F5=Reset         F6=Command        F7=Edit          F8=Image
F9=Shell         F10=Exit          Enter=Do
```

Figure 80. Default Values When Restoring a File from a File System Backup

The following is an explanation of each field:

Hostname of server
> The server hostname if a server option was selected on the prior device selector screen. You cannot change this field.

Device name
> The device, if a tape drive or virtual device was selected. You cannot change this field from this screen.

Disk image file
> The name of the disk image file previously selected. This field is displayed only if a disk image file name was selected. You cannot change this field from this screen.

TSM Backup ID
> This option will only be displayed when the **Device or file name** is a Tivoli Storage Manager virtual device. The value for this field is propagated from a previous input screen and may not be changed.

UDF Backup ID
> This option will only be displayed when the **Device or file name** is a CD/DVD device with UDF formatted media loaded. The value for this field is propagated from a previous input screen and may not be changed.

Restore data type
> The type of data to be restored. This field is for information only and cannot be changed.

Report Output type
> Default=progress indicator. Keep the default value if you want to display a progress indicator during the backup process, which indicates the approximate total backup time and amount completed. Press Tab to

select "file list" to display a list of files as they are being backed up, or Tab once more to show "only errors" that occur during the backup.

Device name for remote volume prompt
Default=(Blank/None). Enter a TTY, LFT or PTS device name to send the volume prompt to a specified device rather than to the current SMIT screen. If you are backing up to a remote host, the device name you specify is attached to the remote host. This field is displayed only when the backup device is a tape drive or virtual device.

Examples of device names are /dev/tty0, /dev/lft0 and /dev/pts/5. You can determine the terminal device name by typing `tty` at the command line on that device.

Allow restore of system data?
If this field is set to "no", the restore process cannot restore certain directories, logical volumes, or file systems that might affect the system operation. Examples are the hd4 (/ file system) logical volume, the /usr file system, or the **/etc/objrepos** directory. Press Tab to change this field to "yes" if you want to allow any system data to be restored, but be aware that this might cause system errors or a complete system failure depending on the inconsistency of the data being restored and the current system configuration.

Allow restore of incremental backup?
Default=no. Change this field to "yes" if you are restoring entire file systems or volume groups from an incremental backup. The restoration of incremental data can have a different effect than restoring regular backup data. Information on restoring incremental backups is detailed in "Understanding Incremental Restores" on page 157.

An error message is displayed and the process terminates if you attempt to restore data from an incremental backup without setting this field to "yes."

Recreate VG, LV, or filesystem before restoring?
Specify this option to remake volume group, logical volume, and file system structures before restoring the data.

> **Note:** If you would like to edit any of the LVM attributes associated with the volume group, logical volume, or file system before recreating them, you may specify the -e flag on the **/usr/sbin/sysrestore** command. This functionality is only available from the command line as there is no SMIT menu equivalent function to edit the attributes.
>
> Instead of using the command line to achieve this functionality, you would simply recreate the LVM structures and restore the data as a two step process. The **Recreate Volume Groups, Logical Volumes & Filesystems** menu allows you to edit the LVM attributes before recreating the structures. Please refer to section "Recreating Volume Groups, Logical Volumes, and File Systems" on page 152 for more information.

Restore non sparse files as non sparse (AIX 5.1 on
Specify this option when there data is being restored to an AIX 5.1 system. You do not have to know which files are sparse VS. non-sparse. This option usually only applies to certain database users restoring database files. Previously, only the AIX tar command could restore files

as non-sparse. However, in AIX 5.1 the **/usr/sbin/restore** command has been modified to handle this as well.

> **Note:** This option only applies to backups being restored to systems running AIX 5.1 or later.

Destination (if different)

Default = blank. If you are restoring data to its original location, leave this field blank. To select an alternate "relative" logical volume or directory for the restored data, select one of the following:

- For a file/directory backup, enter a new directory. If the file to be restored from the media is **/home/tony** and you want to restore the file to **/tmp** directory, the file is restored "relative" to **/tmp**, resulting in the filename **/tmp/home/tony**.
- For a file system backup, enter a new directory. The contents of the entire file system will move to the new directory. The new filenames will *not* be relative to the previous file system mount point. For instance, the /home/tony file system (containing the file **/home/tony/file1**) can be moved to the **/test** directory; the resulting file is **/test/file1** (the **/home/tony** directory prefix is removed).
- For logical volume backups, enter a new logical volume name. The data is restored to the new logical volume. An "end of file" error occurs when writing the data if the new logical volume is smaller than the original.

Using this option sets the destination globally for all data being restored.

> **Note:** You can specify a multiple destinations for multiple logical volumes, volume groups, or file systems to restore only when using the **Destination Directory Filelist** option.

Destination Directory Filelist

This option will overwrite the default destination directory and / or the value set by the **Destination (if different)** option. Rules for file list formatting:

- Entries with spaces or special characters in the name must be double quoted.
- For full system, volume group, and file system level backups:
  - You may only specify one unique destination directory per file system and / or file system contents.
  - File or directory file list entries that exist in the same file system can only be restored to the same unique destination directory.
  - File or directory file list entries that exist in different file systems can be restored to as many unique destination directories provided that they conform to the above rules as well.
- For logical volume level backups:
  - You may only specify one unique destination directory per logical volume.
- For file or directory level backups:
  - You may only specify one unique destination directory per backup image.

This option is used in conjunction with the **File Containing a List of Data to be Restored** option which is a single column file list. e.g. You

may only specify a list of items to restore. However, by adding this **Destination Directory Filelist** you may specify a two column restore file list. e.g. first column specifies the data to restore and the second column specifies the new destination for the data in the first column.

The order of priority for processing destination locations is:

a. The location defined for the data in the **Destination Directory Filelist**. If there are data entities to restore that are not included in an entry defined in this file list, SysBack checks for the existence of a setting in the **Destination (if different)** option.

b. The location defined by the **Destination (if different)** option. This is a globally applied option and is only over ridden by an entry for the data entity in the **Destination Directory Filelist**.

c. If the **Destination (if different)** option is not set and data entity to restore is not included in an entry for a data entity in the **Destination Directory Filelist**, then the default location of the data is used.

Exclude List File Name
> Specify the fully qualified path and file name of the exclude list to be processed in restore services. If you do not specify a path name along with the file name, the file name specified will be checked for in the **/usr/lpp/sysback** directory.

File Containing a List of Data to be Restored
> Specify the fully qualified path name to a file that contains the list of files to be restored from this backup image. Use this option when restoring large numbers of files.

> **Note:** The file list structure should be such that there is only one entry per line in the file. For example:
>
> ```
> /tmp/myjunk
> /home/*
> /home/my file name that has spaces in it
> /home/my file name with special %&* characters in it
> ```
>
> This is the only way that SysBack can selectively restore files with spaces or characters that have special meaning to the shell. Also, wildcard restores will correctly restore files and directories that contain spaces or special characters in the name.
>
> For example:
> ```
> /myfs/mydirectory/*
> ```
>
> A wildcard restore specification such as this could restore files and directories like:
> ```
> /myfs/mydirectory/ my file name
> /myfs/mydirectory/my sub d&rectory/ spec#$@l file
> /yourfs/*
> ```
>
> A wildcard restore specification such as this could restore files and directories like:
> ```
> /yourfs/speci@l name/dir/dir
> /yourfs/dir name/file@ special
> ```

Recover only file attributes (AIX 5.2+ only)

This option only restore the attributes of the file that you specify and does not restore the file contents. If the file specified does not exist in the target path, the file is not created and a warning message will be issued. This option restores file attributes selectively depending on the options specified in the string parameter. You may specify any combination of the following as the string parameter:

- A: restores all attributes
- a: restores only the permissions of the files / directories
- o: restores only the ownership of the files / directories
- t: restores only the timestamp of the files / directories
- c: restores on the ACL attributes of the files / directories

Note: WARNING: Usage of this option will overwrite the attributes of the files owned by another user when used by the root superuser.

Data to restore (of above type)

Unless the backup is a file/directory backup and you select to restore all files and directories, this field contains the data to restore as selected on the prior selection screen. This can be a list of volume groups, file systems, logical volumes, directories or regular files, depending on the type of backup to be restored. For a file/directory backup, leave this field blank if you want to restore all files.

If you are specifying multiple files or directories to restore, they must be input as a space separated list. If you are using wild cards in your data specifications, the entry must be surrounded by double quotes (″).

For example:

```
/tmp
"/home/cindy_*"
"/tmp/g.love"
```

SysBack supports three types of BREs (Basic Regular Expressions):

- Zero or more character match *
- Match one or more in a set [ ]
- Match one character within a range in the set [x-y]

8. Press Enter when all fields have been entered correctly. Either a progress indicator or list of files, if selected, is displayed as the data is read from the media and selected data is restored.

Chapter 13. Changing the Volume Group, Logical Volume and File System Attributes

This section describes the process for changing the volume group, logical volume, and file system attributes prior to creating (or recreating) a volume group, logical volume, or file system. The same instructions apply to the following SysBack processes:

1. Installation of a system from a SysBack system backup

2. Recreation of a volume group from a system or volume group backup

3. Creation of a logical volume or file system from a system, volume group, logical volume or file system backup

You can recreate a volume group, logical volume, or file system from within the SMIT menus or using the **remakevg** command at the command line.

When you recreate a volume group, logical volume, or file system, the information is retrieved from the backup media and compared with the current system configuration to determine if the hardware resources are available to recreate the volume group, logical volume or file system as defined on the media. If the configuration matches, you can change the attributes. If the configuration does not match, messages indicate the differences, and you must change the volume group or logical volume attributes to fit the new system.

When you select to recreate a volume group, logical volume, or file system on an active system or when you select to **Change Volume Group & Logical Volume Information** when installing from a system backup, a screen similar to the following is displayed:

```
       +-------------------------------------------------------+
       |     Change Volume Group & Logical Volume Information   |
       +-------------------------------------------------------+



                  Select Physical Volumes for Volume Groups
                        Change Volume Group Attributes
                 Select Physical Volumes for Logical Volumes
                        Change Logical Volume Attributes
                         Change Filesystem Attributes
                       Change Physical Volume Attributes
                           Advance Install Options

 +---------------------------------------------------------------------+
 | Select this option to change the physical volumes which are assigned to each |
 | volume group.                                                       |
 +---------------------------------------------------------------------+
 | Use ARROW or Tab keys to move and ENTER to Select. Press ESC for Main Menu.  |
 +---------------------------------------------------------------------+
```

Figure 81. The Change Volume Group & Logical Volume Information Menu

Notes:

1. The **Change Filesystem Attributes** option is not displayed if you are installing a system from a power backup.

2. The **Select Physical Volumes for Volume Groups** and **Change Volume Group Attributes** options are not displayed if you have chosen only to recreate specific logical volumes and file system from a backup.

3. The **Advance Install Options** menu is only displayed when this menu is invoked by the system installation process.

Press Esc to return to the **Main Menu** if you are installing a system or recreating volume groups, logical volumes, or file systems on an active system in normal mode.

The following sections describe each option in detail.

Selecting Physical Volumes for Volume Groups

If you select the first option on the menu, a screen similar to the following is displayed:

```
        +----------------------------------------------------------+
        |         Select Physical Volumes for Volume Groups        |
        +----------------------------------------------------------+

           VG Name          Option   Physical Volume(s)
           rootvg           Create   hdisk0
           adsmvg           Create   hdisk5 hdisk6 hdisk7
           sysbackvg        Create   hdisk1 hdisk2




 +---------------------------------------------------------------------+
 | Select a volume group from the above list.                          |
 |                                                                     |
 +---------------------------------------------------------------------+
 | Use ARROW or Tab keys to move and ENTER to select. Press ESC to cancel. |
 +---------------------------------------------------------------------+
```
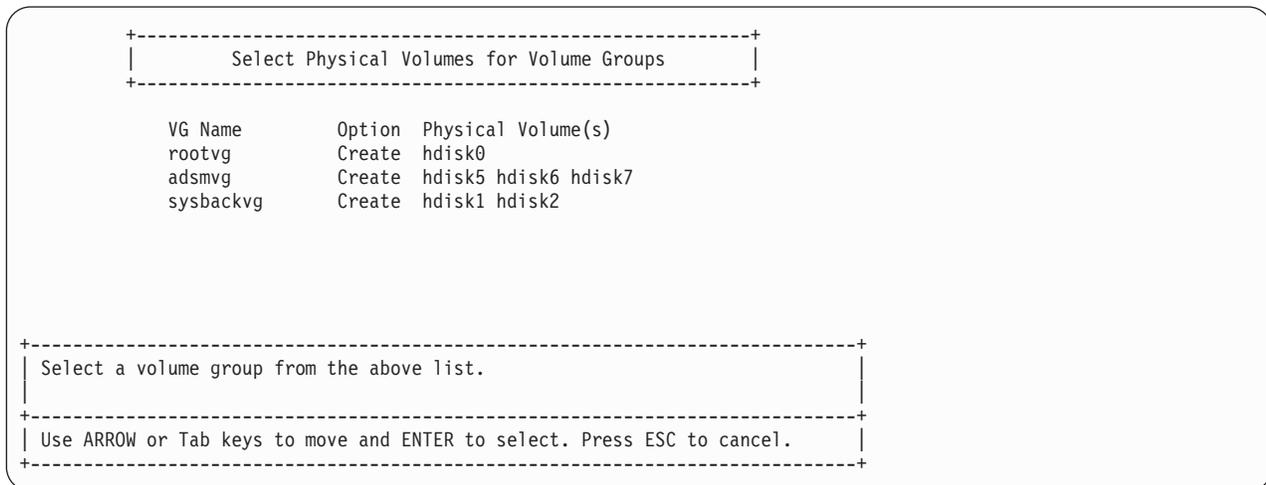
Figure 82. The Select Physical Volumes for Volume Groups Menu

Each volume group and a list of physical volumes, if any, currently assigned to the volume group are listed. From this screen, select the volume group for which to change the physical volumes. A screen similar to the following is displayed:

```
                +-----------------------------------------------------------+
                |        Select Physical Volumes for "rootvg" Volume Group  |
                +-----------------------------------------------------------+

        PVname    Location      Volume Group    Description

        hdisk0    04-C0-00-4,0  rootvg          16 Bit SCSI Disk Drive
        hdisk1    04-02-L       sysbackvg       SSA Logical Disk Drive
        hdisk2    04-02-L       sysbackvg       SSA Logical Disk Drive
        hdisk3    04-02-L       (free)          SSA Logical Disk Drive
        hdisk4    04-02-L       (free)          SSA Logical Disk Drive
        hdisk5    04-02-L       adsmvg          SSA Logical Disk Drive
        hdisk6    04-02-L       adsmvg          SSA Logical Disk Drive
        hdisk7    04-02-L       adsmvg          SSA Logical Disk Drive
        hdisk8    04-02-L       (free)          SSA Logical Disk Drive



          Megabytes required:  3760    Currently Selected:  4302
  +--------------------------------------------------------------------------+
  | Select a PV to add or remove from the "rootvg" volume group. You may NOT |
  | select physical volumes currently assigned to a different VG.            |
  +--------------------------------------------------------------------------+
  | Use ARROW or Tab keys to move and ENTER to select. Press ESC to cancel.  |
  +--------------------------------------------------------------------------+
```

Figure 83. A List of Physical Volumes on a System

This screen contains a list of physical volumes on the system and indicates the volume group to which the physical volume is currently assigned. If a physical volume is not currently assigned to a volume group, (free) will be indicated in the volume group column.

Note:
1. Systems that are using IBM Enterprise Storage Server™, also known as Shark disks, will be displayed in this list during system installation. However, rebuilding volume groups on to these disks during system installation will not create "vpaths". It will recreate the volume group to the hdisk name. If you would like your volume group recreated using "vpaths", specify that the volume group will not be created during system installation and then recreate it with SysBack once the system is up in normal mode.
2. Most EMC® disk drives will be displayed in this list along with their "power disk" names.

Please take note that the **Megabytes required** field indicates the amount of disk space required to contain the logical volumes defined for this volume group. The **Currently Selected** field contains the amount of disk space selected for the volume group. These fields are updated to reflect any changes to the logical volumes or as physical volumes are added or deleted from volume groups.

You cannot select a physical volume assigned to a volume group, other than the volume group with which you are working. You can add or remove a physical volume from the currently selected volume group by performing one of the following:
- To add a physical volume to the selected volume group, highlight any physical volume marked (free) and press Enter. The name of the selected volume group is added to the **Volume Group** column, and the new megabytes of disk space selected are added to the **Currently Selected** field.
- To remove a physical volume from the selected volume group, highlight a line containing the selected volume group name and press Enter. The volume group

column then indicates (free) and the **Currently Selected** field is updated to reflect the new megabytes of disk space assigned to the volume group.

To move a physical volume assigned to the selected volume group to a different volume group, remove the physical volume from the current volume group, return to the prior menu, then select the new volume group to which you want to add the physical volume.

Press Esc to return to the Change Volume Group & Logical Volume Information menu.

Change Physical Volume Attributes

AIX 5.1 introduced the capability to designate a disk as a hot spare for a given volume group. In order to designate a volume as a hot spare, first assign it to the desired volume group using the **Select Physical Volumes for Volume Groups** menu, then use this menu to designate or change its hot spare status.

The menu will appear similar to the one below:

```
      +-----------------------------------------------------+
      |    Change Physical Volume Attributes                |
      +-----------------------------------------------------+

   PVname    Location      Volume Group    Hot     Description
                                           Spare
   hdisk0    04-C0-00-4,0  rootvg          no      16 Bit SCSI Disk Drive
   hdisk1    04-02-L       sysbackvg       no      SSA Logical Disk Drive
   hdisk2    04-02-L       sysbackvg       yes     SSA Logical Disk Drive
   hdisk5    04-02-L       adsmvg          no      SSA Logical Disk Drive
   hdisk6    04-02-L       adsmvg          no      SSA Logical Disk Drive
   hdisk7    04-02-L       adsmvg          yes     SSA Logical Disk Drive



      Megabytes required:  3760    Currently Selected:  4302
+------------------------------------------------------------------------+
| Select a PV to add or remove from the "rootvg" volume group. You may NOT |
| select physical volumes currently assigned to a different VG.           |
+------------------------------------------------------------------------+
| Use ARROW or Tab keys to move and ENTER to select. Press ESC to cancel. |
+------------------------------------------------------------------------+
```

Figure 84. Change Physical Volume Attributes Menu

To designate a physical volume as a hot spare, highlight the physical volume and press Enter. This will toggle the **Hot Spare** field. Press Enter again to return the **Hot Spare** field to its original value.

Changing Volume Group Attributes

To change the volume group attributes, select **Change Volume Group Attributes** from the menu.

A list of volume groups defined on the media is displayed. Select a volume group and press Enter. A screen similar to the following example is displayed:

```
+------------------------------------------------------------+
|            Change "adsmvg" Volume Group Attributes         |
+------------------------------------------------------------+



        Attribute                     Value
        Install Option                Create
        Auto Varyon at System Startup?    yes
        Physical Partition Size (MB)      8
        Quorum Checking?              yes
        Copies                        Not Set
        Concurrent-capable?           no
        Auto-concurrent Varyon?       ***
        Big Enabled Volume Group?     no
        Factor Size?                  1
        Hot Spare?                    no
        Logical Track Group Size?     128
        Auto-sync?                    no
        Filesystem Type?              Not Set
+-----------------------------------------------------------------+
| Type "c" to Create, "i" to Import, or "d" to Delete (ignore).   |
| "Create" will create the volume group and restore data (if on the backup). |
+-----------------------------------------------------------------+
| Use UP/DOWN ARROW or Tab to highlight option to change. Press ESC to return. |
+-----------------------------------------------------------------+
```

Figure 85. The Change Volume Group Attributes Menu

The fields have the following descriptions:

Install Option

Indicates whether the selected volume group should be created, imported or ignored:

Create Enter "c" to completely recreate the volume group on the specified disks. If installing the system, all logical volume and file system data is restored if the data was included on the backup media.

Import

Enter "i" to import the volume group from the physical volumes currently selected for the volume group. If so, the selected physical volumes must currently contain the volume group information.

Delete Enter "d" if you do not want to create the selected volume group. If set to this value, the volume group will be ignored and the physical volumes currently assigned to this volume group can be assigned to another volume group. Any existing data on these volumes will not be destroyed. Therefore, should you decide later to use that data, you may import and vary on the volume group that was previously created on those disks provided that you have not reassigned them to other volume groups.

This option is not available for the rootvg volume group.

Auto Varyon at System Startup?

Press "y" or "n" to indicate whether the volume group should be automatically varied on at system startup. This option cannot be changed for the rootvg volume group.

Physical Partition Size (MB)

Enter a physical partition size in megabytes. Valid options are 2, 4, 8, 16, 32, and 64, 128, 256, 512, and 1024.

Note: The maximum physical partition size varies by level of AIX installed at the time that the backup was created.

If you change the current value, you will receive the following prompt:

```
Changing the PP size requires the recalculations of all logical
volume sizes. Some LVs may increase in size when using a larger PP
size.

Are you sure you want to change the PP size? (y/n)
```

If you do not want to change the size, press "n", otherwise, press "y". If you have selected the "y" option, all logical volume sizes will be recalculated because they are based on the physical partition (logical partition) size of the volume group.

Changing the partition size might require added space to be used by a logical volume. For instance, assume the current volume group has a partition size of 4 MB, and a logical volume within the volume group uses 3 partitions (12 MB). Changing the partition size to 8 MB for the volume group requires that 2 partitions (16 MB) be used for the same logical volume to ensure adequate space for the prior data.

Quorum Checking?
Enter "y" or "n" to indicate whether or not quorum checking should be in effect for this volume group. Quorum checking ensures that there are always a majority of volume group descriptor areas available for this volume group.

Copies
Set this option to globally mirror, or unmirror, all logical volumes in this volume group. By default, this field's value is Not Set. This means that number of copies of each logical volume will be set exactly as it was on the backup image. Valid options are 1, 2, and 3. If you are increasing the number of copies for the volume group, you must ensure that you have enough disks assigned to the volume group to support the extra copies before beginning the installation.

If you do not have enough disks assigned to the volume group to support the number of copies at the time that the installation is started, SysBack will detect this and prompt you to indicate whether or not that you would like to continue. Indicating a "no" response will return you to the SysBack installation menu so that you can adjust your choices. Indicating a "yes" response will cause SysBack to automatically adjust the number of copies to support the number of disks assigned to the volume group.

Note: Even if you set this option globally across the volume group, you may override this setting for any individual logical volume such that it utilizes a different number of copies. Use the **Change Logical Volume Attributes menu** to make this change.

Concurrent-capable?
Enter "y" or "n" to indicate whether or not this volume group should be concurrent-capable, allowing the physical volumes in the volume group to be attached and shared by more than one host.

Auto-concurrent Varyon?
Enter "y" or "n" to indicate whether or not this volume group should be varied on in concurrent mode. This option is not available unless you also selected "y" for the **Concurrent-capable** prompt above.

Big Enabled Volume Group?

Specify" y" to create this volume group as a big enabled volume group which allows greater than 32 disks to be assigned. The maximum number of volumes that may be assigned to this type of volume group is 128. Specify "n" if you do not want the volume group to be created as big enabled.

Factor Size?

Specify a value of 1, 2, or 3 for the volume group's factor size. The factor size affects the number of physical partitions that may be in the volume group.

Hot Spare?

Specify the hot spare policy for this volume group. You will need to ensure that there is an adequate number of physical volumes assigned to this volume group to support you choice. The valid options are:

Y Specifies a one to many ratio of disks to hot spare disks in this volume group.

y Specifies a one to one ratio of disks to hot spare disks in this volume group.

n Indicates that there will not be any hot spares designated for this volume group.

You must first have assigned an adequate number of physical volumes to this volume group to support your choice using the **Select Physical Volumes for Volume Groups** menu. Also, you must designate the desired assigned disks as hot spares using the **Change Physical Volume Attributes** menu before selecting this option.

Logical Track Group Size?

Specify the logical track group size in kilobytes to use for disks in this volume group. Valid options are 128, 256, 512, 1024.

Auto-sync?

Specify "y" or "n" to turn on or off the auto-synchronization of stale partitions in this volume group.

Filesystem Type?

Set this option to globally set the file system type in this volume group. By default, this field's value is Not Set. This means that the file system type will be set exactly as it was on the backup image. Valid options are "1" for jfs or "2" for jfs2 file systems.

If you are changing file systems in the volume group a different type, SysBack will automatically convert or create the appropriate JFS log type to support each file system type included in the volume group if there is enough disk space assigned to that volume group.

> **Note:** Even if you set this option globally across the volume group, you may override this setting for any individual file system such that it utilizes a different JFS type. Use this **Change Filesystem Attributes menu** to make this change.

When all selections are complete, press Esc to return to the prior menu.

Note: This option only applies to backups created on systems running AIX 5.1 or later.

Selecting Physical Volumes for Logical Volumes

By default, SysBack keeps all logical volumes on the same physical volumes as they previously resided, provided that the same physical volumes exist on the current system as existed on the original system. If not, the AIX Logical Volume Manager (LVM) automatically determines a default location for each logical volume in the volume group based on its size and other attributes selected.

You can, however, select specific physical volumes where you want to place each logical volume. This is valuable because better I/O performance can be achieved by placing highly-used logical volumes and file systems on different physical volumes.

When a logical volume is striped across multiple physical volumes, achieving the best I/O performance, you must select the specific physical volumes to use. The number of physical volumes must be a factor of the number of logical partitions (size) of the logical volume.

To select the physical volumes where you want to place a logical volume, select **Select Physical Volumes for Logical Volumes**. A screen similar to the following is displayed, showing a list of all logical volumes defined on the backup media:

```
        +----------------------------------------------------------+
        |       Select Physical Volumes for a Logical Volume       |
        +----------------------------------------------------------+

 LV Name        VG Name       LPs  Copies StrpSz NumPVs MountPoin
 hd5            rootvg        1     1      0      1      -
 loglv02        adsmvg        1     1      0      1      -
 hd8            rootvg        1     1      0      1      -
 loglv00        sysbackvg     2     1      0      1      -
 hd6            rootvg        40    1      0      1      -
 sblv           rootvg        3     1      0      1      -
 hd4            rootvg        4     1      0      1      /
 adsmlv         adsmvg        200   1      0      1      /adsmfs
 hd1            rootvg        2     1      0      1      /home
 lv03           sysbackvg     52    1      0      1      /home/sysback
 lv00           sysbackvg     50    1      0      1      /home/sysback/build
 lv04           sysbackvg     21    1      0      1      /netscape
                                                   MORE..5
+----------------------------------------------------------------------+
| The above logical volumes are for volume groups selected to CREATE. Select a |
| logical volume from the above list.                                  |
+----------------------------------------------------------------------+
| Use ARROW or Tab keys to move and ENTER to select. Press ESC to cancel.   |
+----------------------------------------------------------------------+
```

Figure 86. A List of All Logical Volumes Defined on the Backup Media

The above screen shows each logical volume and the number of logical partitions, number of copies, stripe size and number of physical volumes currently assigned to the logical volume. Select a logical volume and press Enter. A screen similar to the following is then displayed, showing a list of physical volumes currently assigned to the volume group in which the logical volume exists:

```
              +------------------------------------------------------------+
              |            Select PVs for "adsmlv" Logical Volume          |
              +------------------------------------------------------------+

        The following are physical volumes in the "adsmvg" volume group:

        PVname    Location        Description
        hdisk5    04-02-L         SSA Logical Disk Drive
   ==>  hdisk6    04-02-L         SSA Logical Disk Drive
        hdisk7    04-02-L         SSA Logical Disk Drive




   +-------------------------------------------------------------------------+
   | Select PVs to add to or remove from "adsmlv" logical volume.            |
   | The "==>" symbol indicates those currently selected.                    |
   +-------------------------------------------------------------------------+
   | Use ARROW or Tab keys to move, ENTER to select or de-select, ESC to cancel. |
   +-------------------------------------------------------------------------+
```

Figure 87. A List of Physical Volumes Assigned to the Volume Group

> Select a physical volume and press Enter. The physical volume to use must first be assigned to this volume group using the **Select Physical Volumes for Volume Groups** menu. To deselect a currently selected physical volume, select the volume and press Enter.
>
> **Note:** Although you can specify the specific physical volumes where a logical volume is placed, there is no guarantee that the logical volume will be placed only on those disks unless you create the logical volume using a physical partition map. Verification ensures that adequate space exists in the volume group for all of the logical volumes, but no checks are made to ensure that there is adequate space on each disk to satisfy the logical volume selections. If there is not adequate space on the physical volumes when the logical volume is created, it is created using the first available space in the volume group.
>
> When changes are complete, press Esc to return to the previous menu.

Changing Logical Volume Attributes

> Use this option to change a wide variety of logical volume characteristics, affecting its size, physical location, and all other attributes.
>
> A screen containing a list of all logical volumes defined on the media is displayed, such as the following example:

```
        +------------------------------------------------------------+
        |               Change Logical Volume Attributes             |
        +------------------------------------------------------------+

   LV Name         VG Name         Pri    LPs MinLPs Copies MountPoint
   hd5             rootvg          03      1    0      1     -
   loglv02         adsmvg          04      1    0      1     -
   hd8             rootvg          04      1    0      1     -
   loglv00         sysbackvg       04      2    0      1     -
   hd6             rootvg          10     40    0      1     -
   sblv            rootvg          20      3    0      1     -
   hd4             rootvg          20      4    2      1     /
   adsmlv          adsmvg          20    200  107      1     /adsmfs
   hd1             rootvg          20      2    1      1     /home
   lv03            sysbackvg       20     52   48      1     /home/sysback
   lv00            sysbackvg       20     50   48      1     /home/sysback/build
   lv04            sysbackvg       20     21   14      1     /netscape
                                                              MORE..5
  +----------------------------------------------------------------------+
  | Select a logical volume from the above list.                         |
  |                                                                      |
  +----------------------------------------------------------------------+
  | Use ARROW or Tab keys to move and ENTER to select. Press ESC to cancel. |
  +----------------------------------------------------------------------+
```

Figure 88. A List of All Logical Volumes Defined on the Media

The list of logical volumes includes the creation priority, number of logical partitions (size), minimum recommended partitions, number of copies, and file system mount point (if any). If a logical volume had previously been changed so that it would not be created, the line includes the message "*WILL NOT BE CREATED*".

To change the attributes of a logical volume, select a logical volume and press Enter. A screen such as the following is displayed, indicating the current logical volume attributes:

```
        +------------------------------------------------------------+
        |         Change "adsmlv" Logical Volume Attributes          |
        +------------------------------------------------------------+
     +-----------------------------------------+----------------------+
     | Original size: 200 LPS (1600 Mb)        | (*) VG Space (LPs)   |
     | Minimum size:  107 LPS (856 Mb)         | Avail  Used   Free   |
     | PVs selected:  LV: 1   VG: 3            | 805    201    604    |
     +-----------------------------------------+----------------------+

   Create this LV? *     yes           Inter-policy         m (minimum)
   Logical Volume name   adsmlv        Stripe size          0
   Volume Group name *   adsmvg        Use PP map?          no
   Size (in LPs) *       200           MWC?                 yes
   Copies *              1             Write verify?        no
   Priority              20            Bad block relocation? yes
   Type                  jfs           Relocatable?         yes
   Intra-policy          c  (center)   Maximum PVs          32
   Strict                yes           Schedule Policy      p (Parallel)
   Mount Point: /adsmfs                Serialize IO         no
  +----------------------------------------------------------------------+
  | Type "n" if you do not want to create this logical volume. If the LV is not |
  | created, no data for the LV or its file system will be restored.     |
  +----------------------------------------------------------------------+
  | Use UP/DOWN ARROW or Tab to highlight option to change. Press ESC to return. |
  +----------------------------------------------------------------------+
```

Figure 89. The Change Logical Volume Attribute Menu

The box at the upper-left portion of the screen contains information that might assist in making changes to the logical volume size. The **Original size** field

contains the original size of the logical volume. This field does not reflect any changes, so you can always return to this value if you inadvertently change the size. The **Minimum size** indicates the recommended minimum size of a file system that is required to contain the file system data. The **PVs selected** field contains the number of physical volumes currently assigned to the volume group for this logical volume and to the logical volume itself.

The box at the upper-right portion of the screen contains **VG Space** information for the volume group to which the logical volume is assigned. This information is updated to reflect any changes that are made to the logical volume affecting its size. Also, if the volume group name is changed, the box is updated to reflect the values for the new volume group.

The following fields can be changed for the logical volume:

Create this LV?
> Indicates whether of not this logical volume (and file system) will be created. If you enter "n" indicating not to create the logical volume, no other fields can be changed. This logical volume is not created and, if installing a system, the logical volume or file system data is not restored from the backup media.

> If the field currently contains "no," enter "y" to create the logical volume, and you can then change any other field.

> If you change the value of this field, the **VG Space** information box at the top of the screen is updated to reflect the amount of space used in the volume group containing this logical volume.

Logical Volume name
> The name of the selected logical volume. You can change the name of the current logical volume by entering a new logical volume name in this field. You can only enter a logical volume that is not currently defined on the active system or on the backup media.

Volume Group name
> The volume group in which the logical volume currently exists. To move the logical volume into a different volume group, enter the new volume group name. The volume group name entered must be currently active or must be another volume group recreated from the backup media.

> If the volume group name is changed, the **VG Space** information box at the top of the screen is updated to reflect the new volume group.

> If the selected logical volume contains a file system, then you must use a *Journaled File System Log* (*jfslog*) logical volume in the new volume group to mount the file system. If the logical volume is moved to a new volume group, the **/etc/filesystems** file is updated automatically and the file system is mounted using the first available JFS logical volume in the new volume group. If there is no JFS log for that file system type in the new volume group, SysBack will automatically create one for you provided that there is enough disk space allocated to your volume group.

Size (in LPs)
> The size of the logical volume in logical partitions. The actual disk space required by this logical volume is the number of logical partitions multiplied by the number of copies indicated in the following option. To change the size of the logical volume, enter a new value.

You cannot change this field if you are installing the system from a power backup.

If the logical volume contains a file system, the file system is created at the same size as the logical volume.

Entering a size smaller than the **minimum size** displayed at the top of the screen might cause you to run out of file system space when restoring the data from the backup media. If you are installing a system, over-reducing the root / or /usr file systems usually results in a system installation failure.

When you change the size, the **VG Space** box at the top of the screen is updated to reflect the new amount of space used in the volume group containing this logical volume.

Copies

The number of copies (mirrors) of the logical volume. A "1" indicates there is only one copy or that the logical volume is not mirrored. Changing the number of copies to a value greater than one causes the logical volume to be "mirrored" to another disk. *Mirroring* is usually implemented to keep a copy of the logical volume on separate physical volumes to protect data against a hardware failure.

If the number of copies exceeds the number of physical volumes assigned to the logical volume, or the volume group if no physical volumes are specifically assigned to this logical volume, then you will be asked "Do you wish to allow more than 1 copy on a single PV? (y/n)". If you answer "y", the new number of copies is accepted. If "n", the new value is ignored.

When you change the number of copies, the **VG Space** box at the top of the screen is updated to reflect the new amount of space used in the volume group containing this logical volume.

Priority

The default priority in which the logical volume will be created. This is especially important if different logical volumes might be contending for the same region of a particular disk. Setting the priority of a logical volume to a lower number gives it a higher priority.

By default, the priority is set for logical volumes based on their type. The logical volumes appear in the logical volume list in the order in which you want them created. To create one logical volume before another logical volume, change the priority to less than the other. The next time the logical volumes are listed, the changed logical volume appears in a different place in the list.

This field uses a two-digit value, sorted first by the first character, and then by the second. An entry of "1" is sorted after an entry of "06", so use two digits for all entries.

Type   The current logical volume type. The type should not be changed for *paging*, *jfslog*, *dump device*, *boot* logical volumes, and logical volumes assigned to a file system. Although the type "*jfs*" is normally used to indicate file system logical volumes, this and other logical volumes, can be changed to any desired value indicating the type of data contained in the logical volume.

Intra-policy

Specifies the intra-physical volume policy to use. The intra-policy is policy that determines the region of the physical volumes where the logical volume should be placed.

You can enter one the following values for this field:

e   edge (or outer-edge)

m   middle (or outer-middle)

c   center

im inner-middle

ie   inner-edge

Strict   Specify the type of strictness policy that you would like for this logical volume. Valid options are:

y   Specify this option when you would like the logical volume creation to be strict.

n   Specify this option when you do not want the logically volume creation to be strict.

s   Specify this option when you want the logical volume creation to be super strict.

Mount Point

The directory that is the mount point for logical volumes containing file systems. If the logical volume does not contain a file system, a dash (-) is shown in this field and the field cannot be changed.

You cannot change this field if you are installing the system from a power backup.

To change the mount point of the file system, enter a new directory here. The directory you specified will be created when the file system is created if it does not already exist. If installing the system, the data for the file system is restored to the new mount point. For example, if the old mount point was **/home/files** and the new mount point is to be **/data/files**, then a file previously called **/home/files/userinfo** is restored as **/data/files/userinfo**.

If changed, the **/etc/filesystems** file is updated to reflect the new mount point for the file system so that all future attempts to mount the file system will do so to the new mount point.

Inter-policy

Specifies the inter-physical volume policy. The inter-policy is a policy which indicates whether or not the logical volume should be spread across multiple disks. This value can have a different effect depending on the following:

- If no physical volumes are selected for the logical volume: a maximum value spreads the logical volume across either all of the disks in the volume group or the value in the **Maximum PVs** field, whichever is less. A *minimum* value uses the first disk in the volume group unless it fills, in which case the next disk in the volume group is used for the remaining portion.
- If you select physical volumes for this logical volume, a *maximum* value spreads the logical volume across all of the disks selected for the logical

volume, not to exceed the value of the **Maximum PVs** field. A *minimum* value uses the first disk in the list unless it fills, in which case the next disk in the list is used.

- If only one disk has been selected for the logical volume or volume group, this policy has no affect.
- If the **Stripe size** is set to any value other than zero (0), this policy has no effect.

Stripe Size

The current stripe size (in Kbytes) or "0" if the logical volume is not striped. Striping a logical volume means that data is dispersed throughout the specific physical volumes in blocks of data indicated by the stripe size. Striping usually benefits random I/O performance, but having a logical volume spread over more than on physical volume causes the entire logical volume to be unreadable if any of the disks containing a part of the logical volume becomes unavailable.

For a logical volume to be striped, you must first assign two or more physical volumes to this logical volume, and the number of **logical partitions** (LPs) must be a multiple of the number of disks selected. You must enter the stripe size in Kbytes (1024 byte blocks). Valid values are 0, 4, 16, 32, 64 or 128. Setting the value to "0" indicates the logical volume will not be striped.

You cannot change this field if you are installing the system from a power backup, if the logical volume is to be created using a partition map or if the number of **Copies** is greater than 1.

Use PP map?

Indicates whether or not to preserve physical partition mapping. This value is set to "no" by default, or to "yes" if you selected to preserve physical partition mapping when the backup was created.

Select "y" to retain the exact prior physical partition placement of the logical volume as it was placed on the original system. Creating a logical volume using the partition map is typically performed only if the logical volume was originally created using a partition map. If the logical volume was not originally created using a map, doing so now often retains the partition fragmentation that exists after logical volumes are periodically increased in size. This would usually cause a negative impact to I/O performance to this logical volume.

When you use a map to create a logical volume, the prior physical volumes must still exist and be of the same size. You cannot change the size, number of copies, striping, or physical volumes for a mapped logical volume. Also, the *Intra-policy* and *Inter-policy* values are ignored.

Select "n" to not retain the prior physical partition map. In this case, the partitions in the logical volume are created contiguously. The logical volume will continue to be created in the general location as defined by the physical volume list, Intra-policy and Inter-policy.

MWC?

Indicates whether or not the *mirror-write-consistency* checking is in effect. If it is, the volume group status area is updated when writes are performed to a mirrored logical partition. This status is then used in the case of a disk or system failure to ensure that all mirrored partitions are identical when the volume group is again varied on. Turning off the MWC increases I/O

performance when writing to mirrored logical volumes but requires you to resynch all mirrors in their entirety in cases of unexpected system halt.

y   Specify this option to turn on active mirror write consistency which ensures data consistency among mirrored copies of a logical volume during normal I/O processing.

P   Specify this option to turn on passive mirror write consistency which ensures data consistency among mirrored copies during volume group synchronization after a system interruption.

n   Specify this option when you do not want to enable mirror write consistency for this logical volume.

This field has no effect for single copy logical volumes.

Write-verify?
Indicates whether a read is performed after every write to ensure that the data was written properly. Enabling this attribute decreases the I/O performance when writing to a logical volume but provides higher assurance that data was written properly and is readable. Enter "y" or "n" to change the value.

Bad block relocation?
Indicates whether the software should relocate data in bad blocks when a write error occurs. This action is normally executed by the disk hardware, but the hardware might not have this feature or might not have enough space for the number of blocks to relocate. Enabling this value does not affect I/O performance. To change this value, enter "y" or "n".

Relocatable?
Indicates whether or not this logical volume can be moved to a new location when a volume group is reorganized using the AIX **reorgvg** or **migratepv** command. If you want to enable this logical volume to relocate, enter "y" in this field.

Schedule Policy?
This option changes the scheduling policy when more than one logical partition is written.

p (Parallel)
        Specify this option to establish a parallel scheduling policy.

s (Sequential)
        Specify this option to establish a sequential scheduling policy.

ps (Parallel Sequential)
        Specify this option to establish a parallel write with a sequential read policy. All mirrors are written in parallel but always read from the first mirror if the first mirror is available.

pr (Parallel Round Robin)
        Specify this option to establish a parallel write with a round robin read policy. This policy is similar to the parallel policy except an attempt is made to spread the reads to the logical volume more evenly across all mirrors.

Serialize IO?
Use this option to enable serialization of overlapping I/Os. If serialization is enabled, then overlapping I/Os are not allowed on a block range and only a single I/O in a block range is processed at any one time. Most

applications like file systems and databases do their own serialization processing. The default for new logical volumes is off. Valid options are "y" for on and "n" for off.

Maximum PVs

Specify the maximum number of physical volumes onto which the logical volume can be placed. This value limits the number of physical volumes used when the Inter-policy is set to "maximum".

The valid values for this option are directly impacted by the **Big Enabled Volume Group** and **Factor Size** options. Please refer to your AIX documentation to determine the maximum allowed physical volumes based on your configuration choices.

Changing File system Attributes

Selecting this option enables changes to the file system attributes for logical volumes that contain file system data. This option does not appear when you install from a power backup because all of the file system data was backed up as raw logical volumes which causes any changes to the file system attributes to be overwritten during the restoration of the data. When you first select the option, the following screen is displayed:

```
        +---------------------------------------------------------+
        |                 Change Filesystem Attributes            |
        +---------------------------------------------------------+

        LV Name          Mount Point                  Type
        hd4              /                            jfs
        adsmlv           /adsmfs                      jfs
        hd1              /home                        jfs
        lv03             /home/sysback                jfs
        lv00             /home/sysback/build          jfs
        lv04             /netscape                    jfs2
        hd3              /tmp                         jfs
        hd2              /usr                         jfs
        instlv           /usr/sys/inst.images         jfs
        lv01             /usr1                        jfs2
        hd9var           /var                         jfs


  +--------------------------------------------------------------------+
  | Select a filesystem from the above list.                           |
  |                                                                    |
  +--------------------------------------------------------------------+
  | Use ARROW or Tab keys to move and ENTER to select. Press ESC to cancel.  |
  +--------------------------------------------------------------------+
```

Figure 90. The Change File System Attributes Menu

Select a file system to change and press Enter. A screen similar to the following is displayed, containing the current attributes for the file system:

```
+----------------------------------------------------------+
|          Change Filesytem Attributes for "adsmlv" LV     |
+----------------------------------------------------------+


   Attribute                      Value
   Mount Point                    /adsmfs
   Fragment Size                  4096
   Number of Bytes per Inode (NBPI)  4096
   Use Data Compression?          no
   Large File Support?            n
   Allocation Group (AG) Size     8
   Advanced Journal Filesystem?   yes
   Filesystem Block Size?         1024
   Dense Filesystem?              no
   Use Inline JFS log?            yes
   Inline Log Size
+---------------------------------------------------------------+
| Type the new top directory where this filesystem is to be mounted. |
|                                                               |
|                                                               |
+---------------------------------------------------------------+
| Use UP/DOWN ARROW or Tab to highlight option to change. Press ESC to return. |
+---------------------------------------------------------------+
```

Figure 91. The Current Attributes for a File System

The following attributes can be changed for the file system:

Mount Point

The directory that is the mount point for the file system. This field is identical to the **Mount Point** field when changing the logical volume attributes.

To change the mount point of the file system, enter a new directory name. The directory specified is created when the file system is created if it does not already exist. If you are installing the system, the data for the file system is restored to the new mount point. For example, if the old mount point was **/home/files** and the new mount point is to be **/data/files**, then a file previously called **/home/files/userinfo** is restored as **/data/files/userinfo**.

If changed, the **/etc/filesystems** file is updated to reflect the new mount point for the file system so that all future attempts to mount the file system will do so using the new mount point.

Fragment Size

The current file system fragment size, or *fragsize*. You can indicate a new fragsize in bytes. The valid values are 512, 1024, 2048, and 4096. If you are using file system compression, the fragsize must be set to 2048 or less.

A file system containing many small files can benefit from using a small fragsize because each file requires less space. Larger files with small fragsizes will require more I/O requests and more system processing to read and write larger pieces of data.

Note: If you *increase* the current fragment size value, a file system with many small files might require more file system space, because each individual file requires more physical disk space. Increasing this value can cause the file system to run out of space when restoring the files. If the file system is nearly full, increase the size of the logical volume for this file system to provide added space.

Number of Bytes Per Inode (NBPI)

The current NBPI. The NBPI indicates the number of bytes of file system space that accounts for each inode in the file system inode table.

Enter a new value, which must be 1024, 2048, 4096, 8192, 16384, or 32768. The valid values differ depending on the value in the **Allocation Group (AG) size** field. The valid values are shown at the bottom of the screen.

Note: *Decreasing* the NBPI value might cause a nearly full file system to run out of space when restoring a large amount of data because the file system control information uses more space on the disk. *Increasing* the NBPI value uses less space for file system control information but increases the possibility of running out of file system Inodes when restoring a large number of files.

Use Data Compression?

Indicates whether or not the data is to be compressed in the file system. Enter "y" or "n" to change the current value. Compressing the data requires less disk space depending on the type of data. However, each read or write of data requires much more system processing to compress and uncompress the data.

Note: If you do not to use compression on a previously compressed file system, the data uses more space in the file system as it is being restored. Because it is not possible to estimate the amount of added space required, change the logical volume size for this file system to at least twice the **Minimum size** indicated at the top of the screen to ensure that you do not run out of space during the restore.

Large Files Support?

Indicates whether large files are supported for this file system. Only if this field is set to "yes" can you create files larger than 2 gigabytes in size within this file system.

To change the current value, enter "y" or "n"

Allocation Group (AG) Size

Indicates the current allocation group size. The allocation group is a grouping of Inodes and disk blocks similar to BSD cylinder groups.

You can enter a new value in megabytes, which must be 8, 16, 32 or 64. The valid values will differ depending on the value in the **Number of Bytes Per Inode (NBPI)** field. The valid values are shown at the bottom of the screen.

Advanced Journal Filesystem?

Specify "y" or "n" to make this file system a JFS2 filesystem.

Note: If you do not already have a JFS2 log in this file system's volume group, and you have not specified to enable an **Inline JFS Log**, then SysBack will automatically create a JFS2 log for you provided that you have enough disk space assigned to support it.

Fileystem Block Size

Use this option to specify the JFS2 block size in bytes. A file system block is the smallest unit of disk storage that can be allocated to a file. Valid options are 512, 1024, 2048, and 4096. This option only applies to JFS2 file systems.

Dense Filesystem?

This option specifies that when files are created with holes JFS2 will allocate disk blocks for those holes and fill them with 0's. This option is no longer supported by AIX but remains in these menus to address backups previously created. This option should always be set to "n" If you mistakenly set this option to "y", or you have restored a backup created with and older level of SysBack, the latest SysBack code will automatically correct this value and set it to no.

Use Inline JFS Log?

Specify "y" to this option to place the JFS2 log for this file system in the logical volume along with file system. Valid options are "y "and "n".

Inline Log Size?

If you have set the **Use Inline JFS Log** to "y", then use this option to specify the desired size of that log in megabytes. If you do not enter a size and leave the value set to "0", AIX will automatically determine the size based on its algorithms.

Note: The size may not exceed 10% of the file system size.

Advance Install Options

This menu will be invoked when you have selected to edit the LVM information when creating an LVM Information file, and during system installation. When you select this option, the following menu will display:

```
        +---------------------------------------------------------+
        |              Advance Install Options                    |
        +---------------------------------------------------------+



        Attribute                              Value
        Enable 64 bit Kernel?                  no
        Enable JFS2 Filesystems?               Not Set
        Restore non-sparese files as non-spase no
+----------------------------------------------------------------------+
| Type "c" to Create, "i" to Import, or "d" to Delete (ignore).        |
| "Create" will create the volume group and restore data (if on the backup). |
+----------------------------------------------------------------------+
| Use UP/DOWN ARROW or Tab to highlight option to change. Press ESC to return. |
+----------------------------------------------------------------------+
```

Figure 92. The Advance Install Options Menu

The following attributes may be changed:

Enable 64 bit Kernel?

Set this option to enable the AIX 64-bit kernel. This assumes that 64-bit kernel support was installed on to the system that created this backup image regardless of whether or not that system was running the 64-bit kernel.

Enable JFS2 Filesystem?

Set this option to globally set the file system type for all volume groups on this system. By default, this field's value is Not Set. This means that the file system type will be set exactly as it was on the backup image. Valid options are "1" for jfs or "2" for jfs2 file systems.

If you are changing file systems in the volume group to a different type, SysBack will automatically convert or create the appropriate JFS log type to support each file system type included in the volume group if there is enough disk space is assigned that volume group.

> **Note:** Even if you set this option globally across the volume group, you may override this setting for any individual file system such that it utilizes a different JFS type. Use this **Change Filesystem Attributes menu** to make this change.

If you perform a backup and then change the file system type for rootvg to be different than the type originally backed up, it is highly recommended that you perform a new backup immediately following the system restore. The reason for this is that you will no longer be able to use this existing backup image to boot the system solely for the purpose of importing the rootvg volume group for maintenance. Booting a system that has one file system type from a boot image that had a different file system type will cause needed mounts to fail when attempting to import the root volume group. You will still be able to use this tape to boot and reinstall the system with the settings of your choice, simply not to boot and perform maintenance on rootvg.

Restore non-sparse files as non-sparse

Specify this option to make the file sparse. You do not have to know which files were sparse and not sparse. This option usually only applies to certain database users restoring database files.

Chapter 14. System Installation and Maintenance

A backup created using the **System Backup** option can be used to completely reinstall the original system from which it was made or to install other machines with the same or different hardware configurations. During the installation process, the following functions are provided:

- The volume group, physical volumes, and logical volumes contained on the backup are compared with the current system hardware configuration. If there are inconsistencies, such as missing disks or smaller disks that cannot contain the prior data, you must change the volume group or logical volume information to fit the new system configuration.

- A simple menu interface is provided to change any volume group, logical volume or file system size or other attribute. This includes selecting the disks contained in each volume group or the disks where each logical volume will reside. You can also exclude certain volume groups, logical volumes, or file systems from the installation or move logical volumes and file systems between volume groups.

- Optionally, individual volume groups, other than rootvg, can be imported from disk (if they currently exist), ignored, or recreated and restored. By default, they are created on the original disks (according to the hardware addresses, if they exist).

- By default, all logical volumes are recreated at their original sizes and on the same disks and disk locations, if available. If original disk locations are not available, the logical volumes are recreated where space permits.

- Logical volumes are, by default, recreated using physical partitions that are contiguous on the disks, unless you specify that the physical partition maps to be preserved when the backup was created. You can also select to change the partition policy for select logical volumes during the installation process. Allowing the partitions to be created contiguously reduces any prior fragmentation that might have existed, thereby increasing the I/O performance to those logical volumes.

- The original device configuration is restored if the same adapters are detected on the new system.

Recovery Installation

One of the options provided in the **Utilities** menu is to perform a recovery installation. This option enables you to reinstall the operating system from a system backup without affecting other file systems and logical volumes in the rootvg volume group. This option is not intended for upgrading the operating system level, but recovering from operating system failures. To learn more about recovery installations, please read the "Performing Recovery Installation" on page 196 section for added details.

No-prompt Installation

Installation processes for a client may be configured for an unprompted installation. To learn more about how to configure a no-prompt install, please read about the **Network Install Client Defaults** option in "Setting the Network Install Client Defaults" on page 212, the **Tape Boot Defaults** option in "Changing SysBack Tape Boot Defaults" on page 281, the **CD/DVD Boot Defaults** option in "Changing

SysBack CD/DVD Boot Defaults" on page 286, and the **TSM Network Install Client Defaults** option in "Configuring Network Boot Options for Use with TSM" on page 253.

If the client is configured for a no-prompt installation, the **SysBack Installation and Maintenance** menu does not appear as described in the following section, but instead the installation proceeds without any input from the user. This occurs if all required default information has been provided and the LVM information on the backup media is compatible with the system to be installed. If, for example, the prior physical volumes are not available or if there is not enough disk space on the client, errors occur, and the installation process defaults to a prompted installation as described in the remainder of this section.

If the installation defaults and backup data are compatible with the client system, the installation proceeds as if you selected the **Install the System with Current Settings** option from the Main Menu.

Handling Installation Errors

If an error occurs during installation, it occurs in one of the following ways:

1. If the error is a warning message only, the process displays the message and proceeds normally.
2. If the error is recoverable, a message details the error, and you are given the option of either continuing the installation process normally or entering a system maintenance shell. From the maintenance shell (preceded by a `ksh>` prompt), you can manually take the necessary steps needed to recover from the error and then type `exit` to continue the installation.
3. During a no-prompt installation, codes are displayed on the system LED panel indicating both the progress of the installation and if any errors have occurred. If an error that required user intervention occurs, an LED `c48` is displayed, the detailed error is displayed on the system console, and the process defaults to a prompted installation. Depending on the point of the error, you are either prompted as described above or placed in the **Installation and Maintenance** menus.

The system LED displays various codes during a tape or network boot process, as well as various status messages during a no-prompt installation. To learn about LEDS that you might encounter during the system installation process and what they mean, please read Appendix C, "LEDS," on page 483 for details

The SysBack Installation and Maintenance Menu

To display the **SysBack Installation and Maintenance** menu used to initiate a SysBack system installation, the machine you want to install must first be *booted* from either a SysBack system backup tape, CD or DVD, or a SysBack network boot server.

Note: The **Installation and Maintenance** menu is not displayed when you perform a no-prompt installation after booting unless an error has occurred in the installation process due to an incompatibility between the information on the backup and the system to be installed.

The instructions for booting the system vary for each boot type and also differ greatly depending on the type of the machine to be booted. You should refer to the

documentation that accompanied your particular machine type for detailed instructions regarding system boot procedures.

After you have followed these instructions, the following SysBack **Installation and Maintenance** menu is displayed:

```
          +------------------------------------------------------------+
          |IBM Tivoli Storage Manager for System Backup and Recovery |
          +------------------------------------------------------------+
                    +-------------------------------+
                    |    Installation & Maintenance  |
                    |         M A I N   M E N U      |
                    +-------------------------------+

                          Change Installation Device
              Change Volume Group & Logical Volume Information
                   Install the System with Current Settings
                              Utilities Menu
             Debug Options
                            Reboot the System
      +--------------------------------------------------------------------+
      | Installation Device: Tape Drive [rmt0]                             |
      |                                                                    |
      +--------------------------------------------------------------------+
      | Use ARROW or Tab keys to move and ENTER to Select.                 |
      +--------------------------------------------------------------------+
```

Figure 93. The SysBack Installation and Maintenance Menu

The instructions that follow detail the steps for changing the installation options and performing a system installation.

Changing the Installation Device

The default installation device is set to the device from which the system was booted and is displayed on the **Main Menu**. Select the **Change Installation Device** option to change the installation device. After selecting this option, you are presented with a menu similar to the following:

```
          +----------------------------------------------------------+
          |                Change Installation Device                |
          +----------------------------------------------------------+

      Device          Description                     Location
  ==> /dev/rmt0       5.0 GB 8mm Tape Drive           04-C0-00-5,0
      /dev/tok0       IBM PCI Token-ring Adapter (14101800   04-05
      /dev/ent0       IBM PCI Ethernet Adapter (22100020)  04-B0
      /dev/cd0        SCSI Multimedia CD-ROM Drive    04-C0-00-6,0
      tsmdev          TSM Virtual Device



      Autoloader?  No
  +--------------------------------------------------------------------+
  |        Select one network device or one or more tape devices.      |
  |           The "==>" symbol indicates current choice(s).            |
  +--------------------------------------------------------------------+
  | Use ARROW or Tab keys to move, ENTER to select or deselect, ESC when done. |
  +--------------------------------------------------------------------+
```

Figure 94. The Change Installation Device Menu

If you selected a network adapter as the installation device, you can select only one option. However, you can select more than one tape drive as the installation device if you are installing from a parallel backup (created on a parallel virtual

device), or if you want to use multiple sequential devices (automatically change to the next device in the list when prior reaches end of volume). To learn more about virtual devices, please refer to Chapter 23, "Virtual Devices," on page 337.

Important Note:: If you are installing from a local parallel virtual device, meaning the backup was striped across multiple physical devices, you must select the same number of devices when performing the installation. You must also insert the tapes in the drives in the order they appear on the **Installation Device** menu.

Changing the network installation server after a network boot: If you booted from a network boot server but want to install from a device or file on a different network installation server, select the network adapter that should be used to reach the network installation server. You will then be able to change the network settings used to reach the new server.

If you are installing over the network using a Tivoli Storage Manager virtual device and need to access a different machine to act as your network install server, you should select the tsmdev device entry and not the network adapter used to access that machine. For more information on completing these menus for a Tivoli Storage Manager network install, please read Chapter 17, "Integrating to Tivoli Storage Manager," on page 235 for detailed instructions.

To select a device, highlight the device and press Enter. If the device is a tape, CD, or DVD drive, you can also deselect the device by repeating that action.

If you select a tape device, the **Autoloader** option is displayed. Press either n or y to change this option to either "no" (default) or "yes." If you change this option to *yes* and have a tape device that has an autoloading feature, the system will not prompt you to change volumes but will eject the tape cartridge and wait for the autoloader to insert a new cartridge before continuing automatically.

Press Esc to end and return to the **Main Menu** when you have finished your selection.

Changing the Network Settings

If you selected a network adapter option, the following screen is displayed, based on the network adapter type selected:

```
         +-----------------------------------------------------------+
         |                 Change Network Settings                   |
         +-----------------------------------------------------------+

                 Client IP Address        192.168.1.58
                 Server IP Address        192.168.1.55
                 Gateway IP Address       192.168.1.55
                 Subnet Mask              255.255.255.0

                 Ethernet Interface:
                           ==>  Standard Ethernet Interface
                                IEEE 802.3 Ethernet Interface
                 Ethernet Connection Type:
                           ==>  BNC: Coax Cable
                                DIX: 15-pin D-shell Cable

Network Adapter: ent0  [inactive]
+------------------------------------------------------------------------------+
| Enter the subnet mask, if any, in the format "255.255.255.255". Leave this    |
| field blank if no subnet mask is used.                                        |
+------------------------------------------------------------------------------+
| Use ARROWS or TAB to move or INS/DEL to edit. Press ESC to return.            |
+------------------------------------------------------------------------------+
```

Figure 95. The Change Network Settings Options for a Network Adapter

If you selected a token ring adapter, you receive options similar to the following:

```
         +-----------------------------------------------------------+
         |                 Change Network Settings                   |
         +-----------------------------------------------------------+


                 Client IP Address        192.168.1.58
                 Server IP Address        192.168.1.55
                 Gateway IP Address       192.168.1.55
                 Subnet Mask              255.255.255.0

                 Token-ring Speed:
                             4 Megabits
                       ==>  16 Megabits



Network Adapter: tok0   [inactive]
+------------------------------------------------------------------------------+
| Enter the IP address by which the server refers to this host in the format    |
| "111.222.333.444". You need not include leading zeros.                        |
+------------------------------------------------------------------------------+
| Use ARROWS or TAB to move or INS/DEL to edit. Press ESC to return.            |
+------------------------------------------------------------------------------+
```

Figure 96. The Change Network Settings Options for a Token Ring Adapter

If you selected a FDDI adapter, you receive options similar to those in the figure
above, except that the token ring speed option is not displayed. There are no
options specific to the FDDI adapter.

If you booted from a network boot server, the addresses and subnet mask used to
boot the system are displayed. Otherwise, if the boot media was created on a
system previously network-installed using SysBack, the prior network installation
settings are displayed.

To change the **client IP address**, **server IP address, the gateway IP address**, or the
subnet mask, highlight the line you want to change and enter the new value.

Note: If the client and the network install server are on the same subnet, and the client does not have to pass through a network gateway in order to reach the server, it is recommended that you reenter the **Server Address** in the **Gateway Address** field. If the client and the network install server are on different subnets, you would enter the network gateway address in the **Gateway Address** field.

To change the **ethernet interface**, **ethernet connection type** or the **token ring speed**, highlight the desired selection and press Enter.

When all selections are complete, press Esc to return to the previous menu.

If you are installing over the network using a Tivoli Storage Manager virtual device and need to access a different machine to act as your network install server, you should select the tsmdev device entry and not the network adapter used to access that machine. For more information on completing these menus for a Tivoli Storage Manager network install, please read Chapter 17, "Integrating to Tivoli Storage Manager," on page 235 for detailed instructions.

Important note: For token ring networks, be certain to select the correct token ring speed. Failure to do so could cause disruption on the entire network when the token ring adapter is configured.

Changing Volume Group & Logical Volume Information

The SysBack installation process enables you to fully customize the sizes, locations, and other attributes for volume groups, logical volumes, and file systems.

If you are installing from a network tape drive, CD, or DVD, or a disk image file, the network installation server is contacted to obtain a list of tape drives, virtual devices, or disk image files available to this client. If any options are available, a screen titled "Select Source for Volume Group Data" is displayed. You must select a single option from which you want the data for the volume groups to be restored.

If you are restoring from a Tivoli Storage Manager server, you will be prompted to select the **Backup ID** to use for the install rather than a list of devices from which to restore.

After selecting to change the system settings, the system verifies the volume group information from the backup media against the current system configuration. A screen similar to the following is displayed:

```
         +----------------------------------------------------------+
         |                  Verifying LVM Information ..            |
         +----------------------------------------------------------+
+-----------------------------------------------------------------------+
| COMPLETE                                                              |
+-----------------------------------------------------------------------+
|                                                                       |
|  The following errors were found in the volume group records:         |
|  -------------------------------------------------------              |
|  > Physical Volume ID 0016652284a18698 (previously hdisk0 at          |
|    location 04-C0-00-4,0) does not exist on this system.              |
|  > There are no physical volumes remaining for the rootvg volume      |
|    group. You must assign at least one physical volume to rootvg before|
|    continuing.                                                        |
|                                                                       |
|                                                                       |
|                                                                       |
+-----------------------------------------------------------------------+
+-----------------------------------------------------------------------+
|  The above errors must be corrected before the installation may be performed. |
|                                                                       |
+-----------------------------------------------------------------------+
|                       Press ENTER to continue.                        |
+-----------------------------------------------------------------------+
```

Figure 97. An Example Backup Installation Screen

The above screen provides an example in which a backup is being installed on a different system with physical volumes (disks) that do not match the disk configuration of the original system from which the backup was taken. If there are no inconsistencies, this screen shows no errors and no prompts appear.

After the verification process is complete, the following screen is displayed, providing options for changing volume group, logical volume and file system options:

```
         +----------------------------------------------------------+
         |        Change Volume Group & Logical Volume Information   |
         +----------------------------------------------------------+


                 Select Physical Volumes for Volume Groups
                      Change Volume Group Attributes
                 Select Physical Volumes for Logical Volumes
                      Change Logical Volume Attributes
                        Change File system Attributes
                      Change Physical Volume Attributes
                           Advance Install Options

+-----------------------------------------------------------------------+
|  Highlight the option to select and press Enter.                      |
|                                                                       |
+-----------------------------------------------------------------------+
|  Use ARROW or Tab keys to move and ENTER to Select. Press ESC for Main Menu. |
+-----------------------------------------------------------------------+
```

Figure 98. The Change Volume Group & Logical Volume Information Menu

The option for changing file system options is not displayed if the backup media is a *power backup*. Since the power backup contains only raw logical volumes, no file system information can be changed.

The current settings for each volume group are displayed. You can change the settings for a volume group or for the logical volumes within the volume group by selecting the line number corresponding to the volume group name.

The remaining steps required to change the volume group and logical volume information is identical to the process for editing the volume group and logical volume attributes when recreating a volume group or logical volume on a running system. These instructions are provided in Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

When you finish your changes, press Esc to return to the Main Menu.

Installing the System with Current Settings

When you have made all of your desired selections, such as changing of the installation device or changing the volume group and logical volume characteristics, you can continue the installation by selecting **Install the System with Current Settings** on the **Main Menu**.

If you are installing from a *network installation server* or a Tivoli Storage Manager server and did not previously select to edit the volume group attributes, the server is contacted and a list of available system backup disk image files and installation devices are displayed. You must select a disk image file or device from which the volume group data will be restored.

The system again compares the current hardware configuration with the volume group and logical volume attributes from the backup, including any changes you made from the installation menus, to verify that there is adequate space on the system to continue the installation. If not, a message indicating the problem is displayed and you are returned to the **Main Menu**.

If no inconsistencies are found in the system configuration preventing the installation from proceeding, a confirmation screen similar to the following example is displayed:

```
        +-------------------------------------------------------+
        |                   Install the System                  |
        +-------------------------------------------------------+
+---------------------------------------------------------------------+
| Verifying space requirements ..                                     |
+---------------------------------------------------------------------+
| VG Name        Available MB      Used MB          Free MB           |
| ----------     -------------     -------------    ------------       |
| rootvg         1996 (249 PPs)    1352 (169 PPs)   644 (80 PPs)       |
|                                                                     |
|                                                                     |
|                                                                     |
|                                                                     |
|                                                                     |
|                                                                     |
|                                                                     |
+---------------------------------------------------------------------+
+---------------------------------------------------------------------+
| Continuing the installation at this time will overwrite all disks used by |
| volume groups you chose to create!                                  |
+---------------------------------------------------------------------+
|             Do you wish to continue the installation? (y/n)         |
+---------------------------------------------------------------------+
```

Figure 99. An Installation Confirmation Screen

Press y to continue with the installation or n to return to the **Main Menu**.

For systems with system keys, you can turn the system key to the normal position at any time to enable the system to reboot in normal mode without prompting the user at the end of the installation.

The installation process performs the following steps:

1. The *rootvg* volume group is created, as well as all logical volumes and file systems in the rootvg volume group.

2. The *root* (/) and */usr* file system data is restored.

3. The user defined *post-root install* script is executed if it exists. Additional information may be found in the appendix titled Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487 for details on the post-root installation script.

4. Root volume group installation processing occurs. An example of this processing is updating the device configuration with the new system configuration and rebuilding the boot logical volumes. If you have defined a **Post Device Configuration Script**, it will be processed in this stage.

5. Each additional volume group, and the logical volumes and file systems, are created.

6. The file system and logical volume data is restored for all remaining logical volumes and file systems present on the backup media.

7. The user defined *post-installation* script is executed if it exists. Additional information may be found in the appendix titled Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487 for details on the post-installation script.

8. If you are installing a different machine than the one used to make the original backup, you are asked if the SysBack programs should be removed from the machine. If you have pre-configured this response in the **Utilities** menu, you will not be prompted during the installation process. Details related to this prompt are described in the section "Removing IBM Tivoli Storage Manager for System Backup and Recovery from a Non-licensed Machine" on page 194.

9. If you are installing a different machine than where the original backup was made, and the original machine was configured on a network, you are asked if you want to remove the network configuration. If you pre-configured this response in the **Utilities** menu, you will not be prompted. Details related to this prompt are described in the "Removing the Network Configuration" on page 194 section.

10. If a system key exists and is in the *normal* position, the system is rebooted automatically. Otherwise, you are prompted to turn the key to normal position and press Enter to reboot. You then see the following message:

    ```
    reapplying device configuration from previous install... The system
    will now shutdown and reboot in order to activate the device
    configuration changes...
    ```

The system shuts down and reboots once more. When the installation is complete, the system should look exactly like the original system from which the backup was made, with the exception of any changes that you specified during the installation process. If, however, devices were defined on the original system, and the same physical devices or adapters do not exist on the system which you are installing, those devices will not be defined to the new system.

Removing IBM Tivoli Storage Manager for System Backup and Recovery from a Non-licensed Machine

Because SysBack provides the ability to back up one machine and use that backup to install another, you replicate the SysBack programs as well. If you do not own a license of the product for the machine that you are installing, then you must remove SysBack from the system after the installation.

To accommodate this, the installation process will check to see if you installing the same system from which the backup was originally created. If so, SysBack is retained. If not, the following message will appear at the end of the installation process, just prior to rebooting:

```
This system was installed from a backup originating from another machine.
If you do not have a license of SysBack for this machine, you should select
to remove SysBack at this time.  Should SysBack be removed from this
system? (yes/no
```

If SysBack is not licensed on the current machine, select yes to automatically remove SysBack from the newly installed system. Selecting no retains SysBack from the original backup.

If at a later time you want to remove SysBack from the system, it may be removed through the standard AIX software removal process using the "installp" command.

If you are installing a backup on an LPAR capable machine with a backup that was made from another partition in that same machine, this prompt will not occur. However, if you would like to remove the product from the new partition, you may configure SysBack to do so using the **Utilities Menu** option described in the section "Utilities Menu" on page 195.

Removing the Network Configuration

If you are installing the machine from a backup that was made on a different machine, and the original machine was configured on a network, the current network settings, including the host name, IP address and netmask are restored as well. You can remove the network configuration from this newly installed system during the installation process if desired.

The reason for removing the network configuration at this time is to avoid conflicts with another machine with the same settings that might be currently active on the network. Allowing a machine installation with a network definition that conflicts with another active machine might cause severe network problems.

When removing the network configuration at this time, you will be required to enter the correct settings after the installation is complete using the standard AIX commands for configuring TCP/IP.

To accommodate this scenario, the installation process will check to see if you have installed the same system from which the backup was originally created. If so, SysBack is retained. If not, the following message will appear at the end of the installation process, just prior to rebooting:

```
This system was installed from a backup originating from another machine.
If you would like to remove the network settings contained in the backup
for this machine, you should select to remove the network settings at this
time. Would you like to remove network settings from this system? (yes|no)
```

If you would like to have SysBack remove the network settings for this machine, select yes to automatically remove them. Selecting no retains the network settings from the original backup.

If you are installing a backup on an LPAR capable machine with a backup that was made from another partition in that same machine, this prompt will not occur. However, if you would like to remove the network settings from the new partition, you may configure SysBack to do so using the **Utilities Menu** option described in the section "Utilities Menu".

Utilities Menu

The **Utilities Menu** option provides the following options:

```
       +----------------------------------------------------------+
       |                      Utilities Menu                      |
       +----------------------------------------------------------+



                      Start a Maintenance Shell

                    Import the rootvg Volume Group

                    Perform Recovery Installation

           Set Tape Backup Sequence Number to Install From

                   Post Install Configuration Options

                        Copy a System Dump

           Set Firewall Options


 +-------------------------------------------------------------------+
 | Select an option and press Enter.                                 |
 |                                                                   |
 +-------------------------------------------------------------------+
 | Use ARROW/Tab keys to move, ENTER to Select, ESC to return to Main Menu.   |
 +-------------------------------------------------------------------+
```

Figure 100. The Utilities Menu

Each of the options provided on this menu are described below.

Starting a Maintenance Shell

This option places you at a shell prompt and enables you to perform system maintenance tasks. The following message is displayed:

```
You have entered a maintenance shell. When finished, type "exit" to return
to the Main Menu...  ksh>
```

The maintenance shell is provided for the experienced user, and is typically used to perform system recovery without reinstalling the system. Details for those tasks are beyond the scope of SysBack function and are not provided here.

You can return to the **Main Menu** by typing exit.

Importing the rootvg Volume Group

This option provides the ability to gain access to the operating system data, provided that a *rootvg volume group* already exists on one or more disks on the system.

After selecting this option, you are provided a list of physical volumes that exist on the system and a list of logical volumes that reside on those disks. You must select only one physical volume containing the rootvg volume group to import. Some systems might have more than one rootvg volume group.

It is important that you select a physical volume containing a rootvg volume group. SysBack cannot determine which disks have a rootvg volume group because the volume group information does not include the name of the volume group. However, you should be able to determine the rootvg volume group by looking at the list of logical volumes contained in the volume group.

After you have selected a rootvg volume group to import, you are asked:

```
Mount file systems after importing?
```

Type y or n to indicate whether or not the file systems in the rootvg volume group should be mounted after the volume group is imported. When performing some maintenance tasks, such as checking and repairing the root (/) or /usr file system, you would not want to mount the file systems at this time.

After you make your selection, the rootvg volume group is imported, the root (/) and /usr file systems are checked and repaired if necessary, and then all file systems are optionally mounted. If you chose to mount the file systems, you are then asked:

```
Do you want to rebuild the boot logical volume now?
```

Type y or n to indicate if the boot logical volume should be rebuilt using the AIX **bosboot** command. Doing so can recover from many operating system failures but causes no harm.

You are then placed in a maintenance shell (preceded by the "ksh>" prompt. You can perform operating system commands from this prompt. When ready, use normal operating system procedures for rebooting the system.

Performing Recovery Installation

A recovery installation will restore only the operating system on the client by performing the following steps:

1. Import a *rootvg volume group*.
2. Check, repair if needed, and mount the root (/) and /usr file systems.
3. Restore the root (/) and /usr file system data from the backup media.
4. Rebuild the boot logical volume.
5. Reboot the system.

This process is *not* intended for updating the operating system on the client. It is used to restore the primary operating system file systems from the client's backup. It might be possible to restore the data from a backup taken from another machine, but because only the root (/) and /usr file system data is being restored, there might be incompatibility with other data in the rootvg volume group.

After you select this option, the LVM information is read from the backup media and you are provided a list of physical volumes that exist on the system and a list of logical volumes that reside on those disks. You must select only one physical volume containing the root (/) and /usr file systems to be restored. Some systems might have more than one rootvg volume group.

It is important that you select a physical volume containing a rootvg volume group. SysBack cannot determine which disks have a rootvg because the volume group information does not include the name of the volume group. However, you should be able to determine the rootvg volume group by looking at the list of logical volumes contained in the volume group.

After you select the rootvg volume group to use, the volume group will be imported. You are then asked:

`Do you wish to view/change the logical volume or file system info?`

Type y or n to indicate if you want to view or change the attributes for the root (/) and /usr file systems or logical volumes. This includes such attributes as the size and disk location of these logical volumes. This provides, for example, an effective tool for reducing the size of an overexpanded /usr file system without having to reinstall the entire operating system. Please read about Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165 for additional details.

You have one final prompt to ask if you want to continue the installation process. Then the recovery installation begins. If the operating system was restored from a backup taken on a different machine than the system being installed, you might also be asked whether or not to remove the SysBack product and the network configuration. Upon completion, the system reboots automatically.

Setting Tape Backup Sequence Number to Install From

If you are installing from tape media, and you have "stacked" system backups onto the tapes, you might want to install from a system backup other than the first backup on the tape. If so, you must select the correct backup sequence number using this option. Although no action is performed on the media at this time, changing the backup sequence number to anything other than "1" (the first system backup on the media) causes the media to be forwarded to the correct system backup before any additional installation processing occurs.

After selecting this option, you are prompted for the backup sequence number to use. You must enter "1" for the first backup on the media, or any number up to the number of system backups performed to the media. After making your selection, you return to the **Utilities Menu**.

Post Install Configuration Options

The **Post Install Configuration Options** enable you to set certain common user prompts that display during an installation. Setting the response to these prompts before installation is a convenient way to minimize the intervention required during normal installation processing - especially when cloning a backup image from one machine to another.

From the installation main menu, select **Post Install Configuration Options** to display the following menu:

```
          +---------------------------------------------------------+
          |               Post Install Configurations Options       |
          +---------------------------------------------------------+



                      Remove SysBack Programs After Install
                      Remove Network Settings After Install
                        Install Additional Device Support
          Post Device Configuration Options


    +-----------------------------------------------------------------------+
    | Select an option and press Enter                                      |
    |                                                                       |
    +-----------------------------------------------------------------------+
    | Use ARROW/Tab keys to move, ENTER to Select, ESC to return to Main Menu. |
    +-----------------------------------------------------------------------+
```
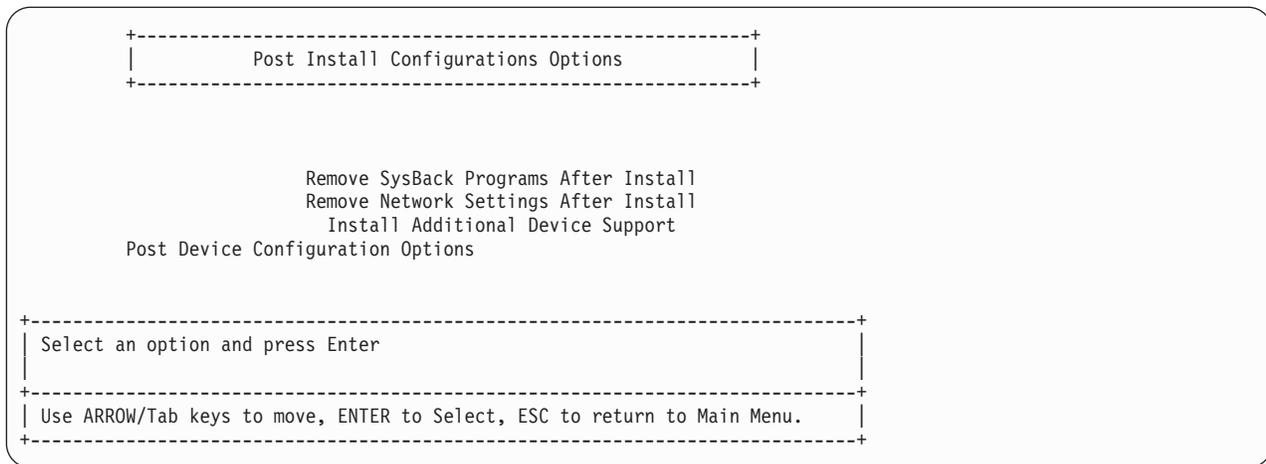
Figure 101. The Post Install Configuration Options Menu

> **Remove SysBack Programs After Install:** Selecting the **Remove SysBack Programs After Install** option displays the following menu:

```
          +---------------------------------------------------------+
          |              Remove SysBack Programs After Install       |
          +---------------------------------------------------------+



                      Do you wish to remove the SysBack program?



    +-----------------------------------------------------------------------+
    |          Y = Remove SysBack.  N = Don't remove SysBack.               |
    +-----------------------------------------------------------------------+
    |      Type in the response and press ENTER or ESC to exit              |
    +-----------------------------------------------------------------------+
```
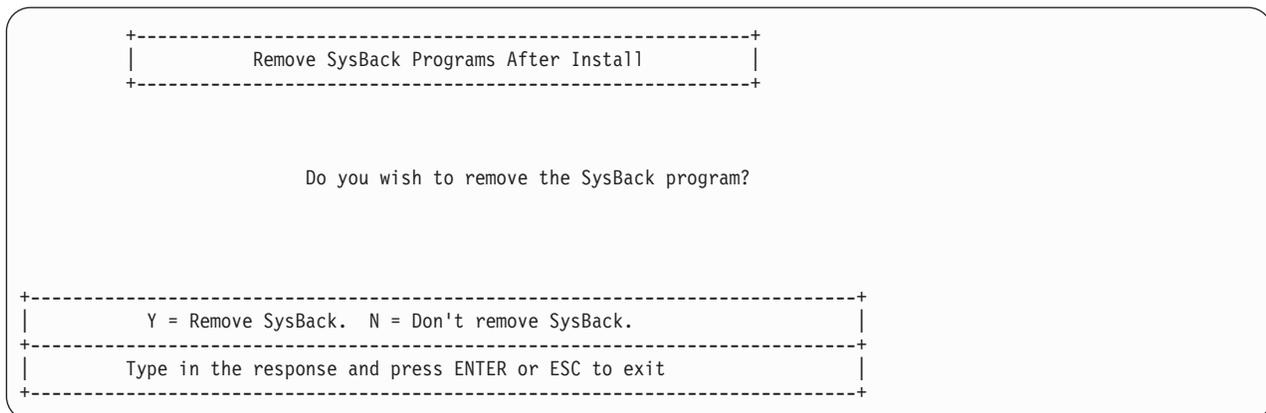
Figure 102. The Remove SysBack Programs After Install Menu

> The yes or no option indicates whether to remove the SysBack program from the system after an installation. This is useful when the user has not purchased a license for the system that will be installed. The default is no.
>
> If you did not set this option prior to installation, you will be prompted for a response as described in the "Removing IBM Tivoli Storage Manager for System Backup and Recovery from a Non-licensed Machine" on page 194 section of this chapter.
>
> This option can also be set prior to installation using the **Network Install Client Defaults** option in "Setting the Network Install Client Defaults" on page 212, the **Tape Boot Defaults** option in "Changing SysBack Tape Boot Defaults" on page 281, the **CD/DVD Boot Defaults** option in "Changing SysBack CD/DVD Boot Defaults" on page 286, and the **TSM Network Install Client Defaults** option in "Configuring Network Boot Options for Use with TSM" on page 253.
>
> Once you have made your selection, press ESC to return to the previous menu.
>
> **Remove Network Settings After Install:** Selecting the **Remove Network Settings After Install** option displays the following menu:

```
+----------------------------------------------------------+
|            Remove Network Settings After Install         |
+----------------------------------------------------------+



                  Do you wish to remove the network settings?




+--------------------------------------------------------------------+
|        Y = Remove network settings.  N = Don't remove network settings. |
+--------------------------------------------------------------------+
|        Type in the response and press ENTER or ESC to exit         |
+--------------------------------------------------------------------+
```
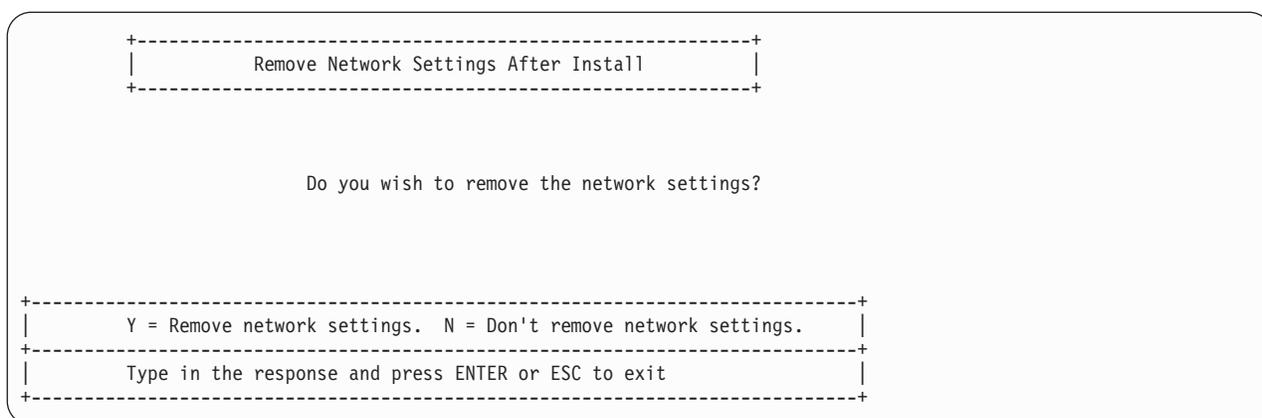
Figure 103. The Remove Network Settings After Install Menu

The yes or no option indicates whether to remove network specific information required to configure the host to the network. This option is useful when the machine being installed was cloned from a backup image of a machine that is still present on the network. The default is no.

If you did not set this option prior to installation, you will be prompted for a response as described in the "Removing IBM Tivoli Storage Manager for System Backup and Recovery from a Non-licensed Machine" on page 194 section of this chapter.

This option can also be set prior to installation using the **Network Install Client Defaults** option in "Setting the Network Install Client Defaults" on page 212, the **Tape Boot Defaults** option in "Changing SysBack Tape Boot Defaults" on page 281, the **CD/DVD Boot Defaults** option in "Changing SysBack CD/DVD Boot Defaults" on page 286, and the **TSM Network Install Client Defaults** option in "Configuring Network Boot Options for Use with TSM" on page 253.

Once you have made your selection, press ESC to return to the previous menu.

Install Additional Device Support: Selecting the **Install Additional Device Support** option displays the following menu:

```
+----------------------------------------------------------+
|             Install Additional Device Support            |
+----------------------------------------------------------+



               Install Device
               Device Support To Install  Minimum



+--------------------------------------------------------------------+
| This option can be a locally attached install device like a tape drive |
| (/dev/rmt#) and CD-ROM (/dev/cd#) or an NFS mounted LPP Source Directory |
+--------------------------------------------------------------------+
| Use ARROW/TAB keys to move, ENTER to Select, ESC to return to Main Menu. |
+--------------------------------------------------------------------+
```
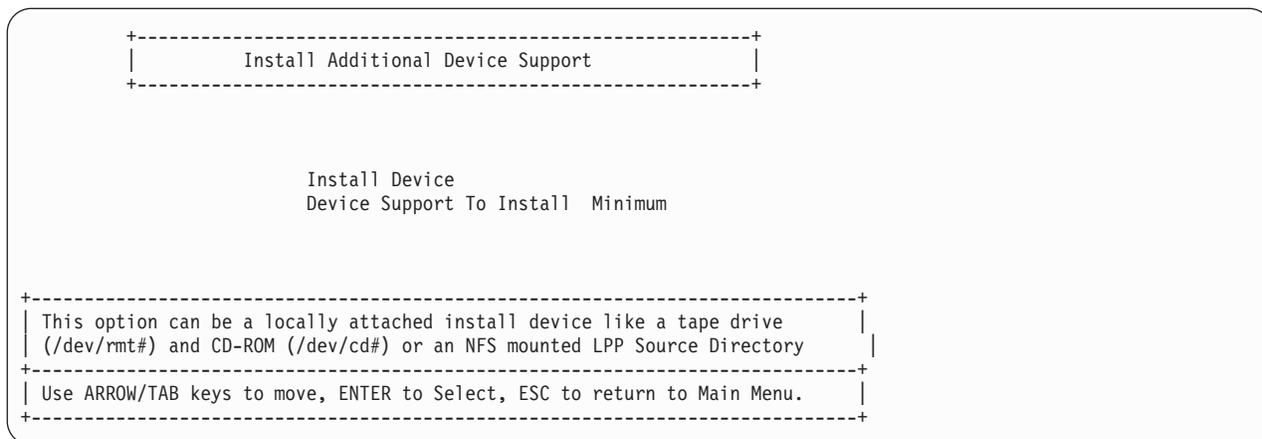
Figure 104. The Remove SysBack Programs After Install Menu

Install Device

This option lets you specify a CD-ROM device name, a tape device name,

or a NIM **LPPSOURCE** directory name. The NIM **LPPSOURCE** directory name provides additional device support to install during installation. This device support, if available in the specified location, will be installed in circumstances where the needed device support for this machine is contained in the boot image, not the backup image to be installed.

If this is a NIM Resource Network Boot, SysBack will automatically pull device support from the NIM **LPPSOURCE** specified when the Network Boot Client was added regardless of whether this option is edited. For additional information about configuring a NIM Resource Network Boot, please read about Chapter 15, "Network Boot/Installation Configuration," on page 207.

Device Support to Install

This option tells SysBack how much of what is stored on the media in the location specified by the **Install Device** option to install. The two options are:

Minimum

Selecting this option will install only those device support filesets identified by AIX when the system was booted. This information is obtained from the file **/tmp/devices.pkgs** which is created by AIX when the system was booted. This file is not always 100% accurate regarding what device support is needed as some devices return invalid "installp" package names rather than individual fileset names. In most cases, however, this is a reliable alternative to pre-installing all device support file sets on to a system prior to creating the backup image.

All Selecting this option tells SysBack to perform an "installp" command against every item contained in the media in the specified location. This may include device support file sets or any other software that is located on the media.

Once you have made your selection, press ESC to return to the previous menu.

Post Device Configuration Options: Selecting the **Post Device Configuration Options** item displays the following menu:

```
        +----------------------------------------------------------+
        |            Post Device Configuration Options             |
        +----------------------------------------------------------+



                    Recover Devices    CLASSIC
                    Configuration Script  /my.pre_rda.script


+----------------------------------------------------------------------+
| "Y" = Yes, keep original device config. "N" = No,don't keep original device |
|  config. "Classic" = Classic device config processing.               |
+----------------------------------------------------------------------+
| Use ARROW/TAB keys to move, ENTER to Select, ESC to return to Main Menu. |
+----------------------------------------------------------------------+
```

Figure 105. The Post Device Configuration Options Menu

Recover Devices

The "Recover Devices" option provides 3 choices: "CLASSIC" , "Y" , and "N". This is an advanced AIX administration concept that should only be

manipulated by those familiar with the AIX ODM and the AIX RDA program. The default option is "CLASSIC".

The "CLASSIC" option indicates that SysBack will process device configuration during the system installation process as it has always done prior to the implementation of this option. In the "CLASSIC" scenario, SysBack will merge the ODM device entries that were created and used by the AIX RAM FS during the initial phase of the system installation process, with the ODM stored in the backup image.

The "Y" option indicates that the ODM entries will be recovered only from the backup image. Using this option is sometimes useful in environments where devices have been given AIX names in an order that is different than how the operating system detects those devices on boot. A common example of this is seen in environments that have multiple port RAN devices with hundreds of "tty" devices attached.

The "N" option indicates that the ODM entries will not be recovered from the backup image. Only those devices that are detected during the system boot process will be configured. These devices will be configured with the default options. Any customized device attributes will be lost.

It is important to note that widely unpredictable results can be seen when using the "Y" and "N" options depending on your system configuration, or if you are cloning, or even if you are simply restoring a backup image to the same hardware. Use this option with extreme caution. If you encounter results other than you expected after specifying the "Y" or "N" options, simply perform the system installation process again and let the process default to "CLASSIC".

Tip:

Use the "CLASSIC"option if:
- you are unfamiliar with the AIX ODM or the AIX RDA program and do not have a specific need to manipulate how the operating system and SysBack detect and configure the devices
- you are cloning the backup image to a new machine that does not have exactly, 100% the same hardware configuration

Use the "Y" option if:
- you are restoring the backup image on the same machine as where the backup image was created.

Use the "N" option if:
- the state of your devices and their definitions is dramatically inconsistent. Using this option under these circumstances will cause the operating system to only configure physically detectable devices to their defaults. You may then begin redefining your other devices and device attributes from scratch.

Filename of Post first boot install script
The file may be located and named as you choose as long as it resides in the root volume group. This script is executed as a part of the first reboot process after all data is restore. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well.

Copying a System Dump

A system dump is recorded when a hardware failure renders the system inoperable or when the system user initiates a dump manually. The system dump is stored in a logical volume designated as a *dump device*. The system always stops after a system dump is recorded as a result of failure.

This option copies the information from the dump device to a tape for later analysis by experienced AIX system support personnel.

When you first select this option, information regarding the last recorded system dump is displayed on the screen, such as the following:

```
Date:        Tue Nov 11 18:58:55 1997
Dump device:    /dev/hd6
Disk location:  04-C0-00-2,0
Size (bytes):   15339008
Status:         Successful
```

If no system dump information is available, a message is displayed and no further options are provided. If system dump information is available, you will receive the following message:

```
Do you wish to copy the above system dump to an output device? (y/n)
```

Type y or n to indicate if you want to proceed. Upon proceeding, you will be provided a list of tape devices available on the system. After you select the device, the dump data is copied to the selected media.

Note: This procedure must" varyon" the *rootvg volume group* to gain access to the dump logical volume and other commands used to collect operating system data. Because the rootvg cannot be varied off, you are placed in a maintenance shell after the dump copy completes, where you can perform other operating system commands or reboot the system.

Setting Firewall Options

If the client is installing its backup image from a remote server located on the network, you may use this option to define the port(s) to use for communication with that remote server.

Selecting the **Set Firewall Options** option displays the following menu:

```
      +---------------------------------------------------------+
      |                Set Firewall Options                     |
      +---------------------------------------------------------+



                     Firewall Ports  1250-1255


+-------------------------------------------------------------------+
| Enter a valid range (start_port - end_port) or list of ports (ports separated|
| by a comma                                                        |
+-------------------------------------------------------------------+
| Use ARROW/TAB keys to move, ENTER to Select, ESC to return to Main Menu.    |
+-------------------------------------------------------------------+
```

Figure 106. The Set Firewall Options Menu

Firewall Ports

Specify the available ports that SysBack should use for communications between the this client and the installation server. If you do not use this option, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must be specified in one of the following ways:

- As a comma separated list of ports. For example: 1670, 1671

  Note: You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.

- As a range of ports. For example: 1670-1700.

The host to use these ports is determined by the network settings defined in the ""Changing the Installation Device" on page 187" menu.

Setting Debug Options

The SysBack installation process has an option that allows you to put the install into "Debug mode" so that you can diagnose any problems that arise. Once the installation process is complete, you can review that debug information or send the trace files to AIX technical support for further analysis.

In the early part of a system installation process, the trace file is stored in RAM memory. Later in the process, it is written to the hard drive. However, if the system installation process hangs or a system crash occurs during the early part of the install, that trace file becomes inaccessible because it was stored in memory.

These options will allow you to store the trace file on a remote system via an NFS mounted directory rather than storing it in memory or writing it to the hard disk of the system being installed. This ensures that the trace information can be retrieved even in the event of an installation process hang or system crash during the installation process.

The **Debug Options Menu** option provides the following options:

```
          +----------------------------------------------------------+
          |                    Debug Options                 |
          +----------------------------------------------------------+

              Change/Show Debug Options
          Change/Set Network Options for Writing to a Remote System


     +--------------------------------------------------------------------+
     |                                |                                   |
     +--------------------------------------------------------------------+
     | Use ARROW or Tab keys to move, ENTER to select or deselect, ESC when done.  |
     +--------------------------------------------------------------------+
```

Figure 107. The Debug Options Menu

Change/Show Debug Options

The **Change/Show Debug Options Menu** option provides the following options:

```
+---------------------------------------------------------+
|                  Change/Show Debug Options              |
+---------------------------------------------------------+

        Debug is          enabled
        Directory path to debug file   [/tmp/debug
        Name of debug file       [lasher.install.debug]
        Write debug to remote system  enabled

+------------------------------------------------------------------------+
|                                         |                              |
+------------------------------------------------------------------------+
| Use ARROWS or TAB to move. Press ESC to return.          |
+------------------------------------------------------------------------+
```

Figure 108. The Change/Show Debug Options screen

Change/Set Network Options for Writing to a Remote System

When selecting this menu option, you will first be presented with a screen similar to the following so that you may select the network interface to use.

```
      +---------------------------------------------------------+
      |                  Change Network Interface               |
      +---------------------------------------------------------+

   Device        Description                    Location
 ==> /dev/rmt0    5.0 GB 8mm Tape Drive          04-C0-00-5,0
     /dev/tok0    IBM PCI Token-ring Adapter (14101800  04-05
     /dev/ent0    IBM PCI Ethernet Adapter (22100020)  04-B0
     /dev/cd0     SCSI Multimedia CD-ROM Drive   04-C0-00-6,0
     tsmdev       TSM Virtual Device

+------------------------------------------------------------------------+
|         Select one network device or one or more tape devices.         |
|             The "==>" symbol indicates current choice(s).              |
+------------------------------------------------------------------------+
| Use ARROW or Tab keys to move, ENTER to select or deselect, ESC when done.  |
+------------------------------------------------------------------------+
```

Once you have indicated your network device preference, one of the following screens will display depending on the type of network device selected.

Figure 109. The Change Network Interface Menu

```
           +----------------------------------------------------------+
           |Change/Set Network Options for Writing to a Remote System |
           +----------------------------------------------------------+

                Client IP Address        192.168.1.58
                Server IP Address        192.168.1.55
                Gateway IP Address       192.168.1.55
                Subnet Mask              255.255.255.0

                Ethernet Interface:
                        ==>  Standard Ethernet Interface
                             IEEE 802.3 Ethernet Interface
                Ethernet Connection Type:
                        ==>  BNC: Coax Cable
                             DIX: 15-pin D-shell Cable

Network Adapter: ent0  [inactive]
+----------------------------------------------------------------------------+
| Enter the subnet mask, if any, in the format "255.255.255.255". Leave this  |
| field blank if no subnet mask is used.                                      |
+----------------------------------------------------------------------------+
| Use ARROWS or TAB to move or INS/DEL to edit. Press ESC to return.          |
+----------------------------------------------------------------------------+
```

Figure 110. The Change/Set Network Options for Writing to a Remote System screen when an Ethernet Device is Selected

The options on this screen have the following meanings:

Client IP Address (Required)

Use this option to specify the IP address of this system that is being installed and using these defaults.

Server IP Address (Optional)

Use this option to specify the IP address of the installation server where the backup media from which the client will be installed exists.

Client Gateway Address (Optional)

Use this option to specify the address of the boot server. If the boot server is also the install server, the same value may be entered. If the client is installed from a server other than the network boot server and a different gateway address is required to reach the install server, enter that gateway IP address. The default is the boot server's gateway address.

Client Subnet Mask (Optional)

Use this option to specify the subnet network mask required for the network adapter to contact the install server, if required, when the client is installed using a network different than that the one from which it was booted.

Ethernet Interface (Optional)

Use this option to select the correct interface type for the network adapter of the install server.

Ethernet Connection Type (Optional)

Use this option to select the correct connection type for the network adapter of the install server.

```
        +------------------------------------------------------------+
        |                  Change Network Settings                   |
        +------------------------------------------------------------+


              Client IP Address          192.168.1.58
              Server IP Address          192.168.1.55
              Gateway IP Address         192.168.1.55
              Subnet Mask                255.255.255.0

              Token-ring Speed:
                              4 Megabits
                    ==>   16 Megabits



Network Adapter: tok0   [inactive]
+--------------------------------------------------------------------+
| Enter the IP address by which the server refers to this host in the format |
| "111.222.333.444". You need not include leading zeros.             |
+--------------------------------------------------------------------+
| Use ARROWS or TAB to move or INS/DEL to edit. Press ESC to return. |
+--------------------------------------------------------------------+
```

Figure 111. The Change/Set Network Options for Writing to a Remote System screen when a Token-ring Device is Selected

Client IP Address (Required)
Use this option to specify the IP address of this system that is being installed and using these defaults.

Server IP Address (Optional)
Use this option to specify the IP address of the installation server where the backup media from which the client will be installed exists.

Client Gateway Address (Optional)
Use this option to specify the address of the boot server. If the boot server is also the install server, the same value may be entered. If the client is installed from a server other than the network boot server and a different gateway address is required to reach the install server, enter that gateway IP address. The default is the boot server's gateway address.

Client Subnet Mask (Optional)
Use this option to specify the subnet network mask required for the network adapter to contact the install server, if required, when the client is installed using a network different than that the one from which it was booted.

Token-ring Speed (Optional)
Use this option to select the correct token-ring speed for the network adapter of the install server.

Rebooting the System Menu

An option is provided on the **Main Menu** to **Reboot the System** if you choose not to reinstall the system at this time.

You can reboot in *normal* mode if the system was previously installed and has not been overwritten. You can also reboot into *service* mode to restart the installation process. The process of selecting between normal and service mode differs depending on the *platform type*.

Once this option has been selected, the system shuts down, the screen clears, and the system reboots.

Chapter 15. Network Boot/Installation Configuration

The SysBack Network Boot/Install Configuration options create and configure a host to provide boot and optional installation services to a client host over the network.

The SysBack Network Boot functions use the BOOTP protocol to enable a client to communicate with the boot server. The client sends a BOOTP request across the network to a server. Then, the server, if configured, responds with the information that the client needs to contact that server and, subsequently, access the network boot image.

Once the client has successfully transferred the network boot image, the client uses this image to boot into maintenance mode and display the **SysBack Installation & Maintenance Main Menu**.

Classic Network Boot and NIM Resource Boot

This section explains the differences between the Classic Network Boot and the NIM Resource Boot.

Classic Boot

The SysBack Classic Network Boot method provides a network boot option for environments that do not use AIX NIM (Network Installation Manager) resources.

The Classic Network Boot method relies on the / and /usr file systems of the boot server for creating the network boot image. The boot server also fulfills other processing requirements for the client during the boot/installation process. Therefore, the boot server must meet certain requirements in order for the boot client to successfully utilize the boot server's resources. Specifically:

1. The operating system level of the boot server must be the same level as the boot client when using SysBack only to boot into maintenance mode. (The client must boot from the same level as what is currently installed.)

2. The operating system level of the boot server must be the same level as the installation/restore image used to reinstall the client machine when booting and installing the client. (The client must boot from the same level as the image to be installed.)

3. The boot server must have installed any AIX filesets required for the client to support attached hardware.

   Note: If filesets are installed specifically to support a boot client, the server must be rebooted, and the network boot image updated and recreated before the client will successfully boot from the boot server.

4. The boot server must have kernel filesets installed to support the processor type (uniprocessor or multiprocessor) of the boot client regardless of whether or not the boot server is of the same processor type.

   Note: If filesets are installed specifically to support a boot client, the server must be rebooted and the network boot image updated or recreated before the client can successfully boot from the boot server.

5. SysBack must be installed on the boot server.

Note: If filesets are installed specifically to support a boot client, the server must be rebooted and the network boot image updated or recreated before the client can successfully boot from the boot server.

Note: The requirement to ensure that the AIX level is the same between the boot server and the boot client is an AIX requirement, not a SysBack requirement. The degree to which the AIX levels have to be the same - i.e. version, release, ML, or even a fix in some cases - can vary depending on the your environment. The SysBack product can not determine what level of exactness is required for the ever changing thousands of files, fixes, and filesets that AIX delivers. Each customer environment is different just as and each release of AIX is different. It is sometimes necessary to ensure that AIX is even at the same Maintenance Level between the two machines. In some cases, it is even necessary to have the same APARs installed if they are related to device or kernel support. You will have to evaluate your environments and make a determination as to what level of exactness is required.

NIM Resource Boot

The SysBack NIM Resource Boot method provides a mechanism for the user to use existing NIM **SPOT** and **LPPSOURCE** resources in combination with SysBack boot and installation operations. The NIM Resource Boot method relies on an existing NIM **SPOT** to provide the network boot image and an existing NIM **LPPSOURCE** to provide the device support that the client may need to support attached hardware. Therefore, the following requirements must be met by the NIM resources:

1. The NIM resources must be correctly configured before attempting to use them with SysBack. For more information on configuring NIM and its resources, refer to the book, *Network Installation Manager Guide and Reference.*
2. The NIM **SPOT** resource server must be the same server to which the client will send its BOOTP request.
3. The NIM **LPPSOURCE** resource server can be either the same server, or a different server, than the NIM **SPOT** resource server.
4. The boot client has been previously configured as a NIM client.
5. The NIM **SPOT** resource meets the operating system level, kernel support, and device support requirements for a boot server explained previously in the Classic Network Boot section.

    Note: If any filesets are installed to the NIM **SPOT** resource to specifically support the boot of a particular client, the network boot image must be updated or recreated before the client will successfully boot from the boot server.

6. The NIM **LPPSOURCE** resource contains any of the filesets needed to support attached hardware, or any kernel support filesets to support processor type (uniprocessor VS. multiprocessor) that the client will require if they are not already contained within the backup image to be installed.
7. SysBack must be installed in the NIM **SPOT** resource. For more information on installing SysBack into a NIM **SPOT** resource, see "Installing SysBack into a SPOT Resource" on page 218.

    Note: If SysBack is installed into a NIM **SPOT** resource to support SysBack boot clients, the network boot image must be updated or recreated before the client can successfully boot from the boot server.

Classic Network Boot

Accessing and Configuring the Classic Network Boot Menus

The Classic Network Boot menus enables the user to:

- Add or change a network boot client
- Set network install client defaults
- Rebuild network boot images
- Remove a network boot/install client

To access the Classic Network Boot menus, select **Classic Network Boot** from the Network Boot/Install Configuration menu.

Note: From a command line, type `smitty sb_netboot`.

Configuring or Updating a Network Boot Image

The Network Boot Image exists on the Network Boot Server, and is sent to the client system only upon request in order to boot the client system to the **SysBack Installation and Maintenance Menus**. This prevents the need to have boot media, such as a tape or diskettes, available at the client in order to perform a network boot.

A separate boot image must be created for each type of network adapter to be used for the network boot. The available network install adapter types are ethernet, token ring, and FDDI. A network boot image must be created for each platform type as well. For example, an rspc platform can boot from the same server as an rs6k platform, but each will use a different network boot image.

If you have applied AIX updates to your system, or have added software to support new hardware on the client, then you should update the boot image using this option. To update an existing boot image, follow the same instructions as creating a boot image for the first time. The previous boot image file will be overwritten, and any configured clients will begin using the new image automatically.

Cloning systems: A System Backup created on one machine can be installed on another machine with a different processor or machine type. If booting a client machine of a different machine type or with a different hardware configuration, you must have installed the device support on the server for all devices to be used by the client machine. You must also have created a separate network boot image for each platform type.

Adding or Changing a Network Boot Client

This option configures a network boot client that is to be booted from the server. This option generates the information needed to respond to the client's BOOTP request, and assigns the specific boot image that will be used to boot the client, depending on the client's network adapter and platform type. If a network boot image for this client's platform, kernel, and device type does not already exist, a boot image will be created in the **/usr/lpp/sysback/netinst/bootimages** directory.

Important Note:: This option provides the client system with permission to mount the server's `/usr` file system in read-only mode. If you do not want the client to be permitted read-only access to the server's

/usr filesystem once the install has completed, use the **Remove a Network Boot Client** option after installation.

If the network adapter changes on the client system, it is necessary to update the server to reflect the new adapter type and hardware address of the client machine. You can update the boot client information if already configured, using the steps for a new client.

The adapter "hardware address" refers to the physical network adapter's hardware address, which differs from adapter to adapter. By entering an adapter hardware address, the server responds to a broadcast BOOTP request so that the client system will not have to specify server information in the BOOTP menu. This option is not usually required by most systems.

To add or change a network boot client:

1. From the **Classic Network Boot Menu**, select **Add or Change a Network Book Client**.

   Note: From a command line, type `smitty sb_cfgbootclient`.

2. Type the client hostname of the machine that will be booted from this server. The client hostname must be resolvable by the server.

   Note: If changing a client already configured to this server, press F4 to get a list of previously configured clients.

3. The following screen will be displayed.

```
                  Add or Change a Network Boot Client


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  *Client hostname              [sysback2.aix.dfw.ibm
  *Client network adapter type        token ring
  Client platform/kernel type         rspc
  Server IP address             [9.19.134.93]
  Client gateway address (optional)      []
  Client subnet mask (optional)        []
  Client adapter hardware address (optional)    []




F1=Help           F2=Refresh        F3=Cancel        F4=List
F5=Reset          F6=Command        F7=Edit          F8=Image
F9=Shell          F10=Exit          Enter=Do
```

Figure 112. The Add or Change a Network Boot Client Menu

The options have the following definitions:

Note: If the client selected was previously configured, the fields will retain their previous values by default.

Client Hostname (Required)
The name of the boot client. This is the hostname, or fully qualified hostname, of the client machine.

Client Network Adapter Type (Required))

The type of adapter the client uses to boot from the network boot server. The default is the first network adapter type detected by the system. The available options are:

- ethernet
- token ring
- FDDI

Client Platform/Kernel Type (Required)

The type of architecture/platform and the processor type of the client to boot from the network install server. The default is the server's platform and kernel type.

The available options are:

chrp Common Hardware Reference Platform

chrp/MP
      Multiprocessor Common Hardware Reference Platform

rs6k RISC System/6000 (uniprocessor)

rs6k/MP
      Multiprocessor RISC System/6000

rspc PCI-based (PC) RISC System/6000 (uniprocessor)

rspc/MP
      Multiprocessor PCI-based (PC) PC RISC System/6000

The first part of the selection is the platform type. The second part (/MP) indicates the kernel type. If the kernel type portion is omitted, a uniprocessor (single processor) kernel is used.

Server IP Address (Required)

The IP Address for the boot server. The default is the current IP address of the system. Change this value only if the boot server has multiple IP addresses and the default supplied is not desirable.

Client Gateway Address (Optional)

The network address of the gateway that the client must use to reach this server, if any.

Client Subnet Mask (Optional)

The network mask, if required, that the client must use to communicate on the network.

Client Adapter Hardware Address (Optional)

The client's network adapter hardware address. This value is required for only certain clients or if the user desires to broadcast the BOOTP request without completing the server information. Do not use this field for clients that communicate with the server through a gateway.

4. Once all entries are completed, press Enter to confirm selections and execute your choice.

Note: If a boot image for the client's adapter, platform, and kernel combination does not already exist, a boot image is created automatically when adding the boot client.

Setting the Network Install Client Defaults

If you install a client system from a network install server, you can customize installation to reduce, or even eliminate, the amount of information a user must enter to initiate the installation of the client machine. The complete elimination of all prompts is referred to as a "no-prompt install" or an "unprompted installation". This is accomplished by setting all installation information that the user is normally prompted for before actually performing the network installation.

Configure the client as a network boot client before you set the network installation defaults for that client.

To set the Network Install Client Defaults:

1. From the **Classic Network Boot Menu**, select **Set Network Install Client Defaults**.

   Note: From a command line, type smitty sb_cfginstclient.

2. Highlight the client and press Enter.
3. The following screen is displayed.

```
                     Set Network Install Client Defaults


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

  [TOP]                                         [Entry Fields]
  *Client hostname                              sysback2.aix.dfw.ibm.c>
  Perform no-prompt installation?                 no                +
  Debug Logging?                                  no                +
  THE FOLLOWING ARE REQUIRED FOR NOPROMPT INSTALL:
  Console Device Name                             []
  Console Terminal Type (if ascii)                []
  Non-rootvg Volume Group Option                Restore rootvg only +
  Restore Device or File                          []                +
  Backup Sequence Number (if tape)                []                #
  Remove Sysback from foreign client after install?  no             +
  Remove Network Config from foreign client?      no                +
  Install Additional Device Driver Support        None              +
  Software Install Device                         []                +
  THE FOLLOWING ARE REQUIRED ONLY IF THE INSTALL SERVER DIFFERS FROM THE BOOT
  SERVER:
  [MORE...11]




F1=Help           F2=Refresh        F3=Cancel         F4=List
F5=Reset          F6=Command        F7=Edit           F8=Image
F9=Shell          F10=Exit          Enter=Do
```

Figure 113. The Set Network Install Client Defaults Menu

The options have the following definitions:

Note: If the client selected was previously configured, the fields retain their previous values by default.

Client Hostname

> This field cannot be changed; it was populated from input of the previous menu screen.

Perform No-Prompt Installation

> Specifies if the client to be installed will be prompted. If this field is set to "no", the installation menus will appear after a network boot.

Otherwise, the installation occurs after the network boot without prompting the user, provided that all required information for the installation is also provided. The default is "no".

Debug Logging

Indicates whether or not to turn on debug logging operations for troubleshooting network boot and installation problems. The default is "no".

Console Device Name

Enter the name of the console device prior to installation to present displaying the prompt prior to the installation menus. The console device can be either an LFT (graphical display) or TTY (ASCII display) device. Examples are */dev/1ft0* or */dev/tty0*. Also, if an LFT device exists on the client, it can also be selected by typing */dev/console*. The default is "none/blank".

> **Note:** The display must be selected, even for a no-prompt install. This lets you receive any error or warning messages and prompts you if the default information provided is insufficient to complete the installation.

Console Terminal Type (if ASCII)

If the console device is an ASCII terminal, or TTY device, you must select a specific terminal type. This ensures that installation menus, if required, are displayed with the correct terminal emulation. Enter the device type or press F4 to display a list of all terminal types defined on the server and select from the list. Examples of common terminal types are ibm3151, tvi925 and vt100. The default is "none/blank".

Non-rootvg Volume Group Option

The default is "Restore Rootvg Only". The following is a description of the options for this field.

Restore Rootvg Only

Only the rootvg volume group is created and restored from the media, even if there were other volume groups defined on the backup. At the end of the install, only the rootvg volume group will be defined on the system.

Restore All VGs

All volume groups that are included on the backup media are created and restored. Volume groups that are defined on the original system but whose data was not included on the backup are created but data is not restored.

Import Non-Rootvgs

The rootvg volume group is created and restored. All other volume groups, if any, are imported from disks on the client. This option assumes that the non-rootvg volume groups already exist on the client. Use this option when restoring the rootvg volume group after a system failure where no other volume groups were affected.

Restore Device or File

The options shown are made available using the **Add or Change Client Host Access to this Server** option under the **Remote Services** menu. You must select an option from this list to prevent being prompted for an installation device or file during the installation process. The default

is "none/blank". For more information on defining these resource, please refer to Chapter 10, "Remote Services," on page 127.

Backup Sequence Number (if tape)
> If the client is installed from tape, and the system backup to be installed is not the first system backup on the tape, enter the backup sequence number. This number must be between 1 and the total number of system backups on the tape media. The default is "none/blank".

Remove SysBack from Foreign Client After Install
> Indicates whether or not to remove the SysBack program from the system after installation. Choose "yes" when you have not purchased a license for the client that will be installed. The default is "no".
>
> **Note:** If you are installing a backup on an LPAR capable machine, that was made from another partition in that same machine, this prompt will not occur. However, if you would like to remove the product from the new partition, you may configure SysBack to do so using the **Utilities Menu** option described in "Remove SysBack Programs After Install" on page 198.

Remove Network Configuration from Foreign Client
> Indicates whether or not to remove network specific information required to configure the host to the network. Choose "yes" when the machine installed was cloned from a backup image of a machine that is still present on the network. The default is "no".
>
> **Note:** If you are installing a backup on an LPAR capable machine, that was made from another partition in that same machine, this prompt will not occur. However, if you would like to remove the product from the new partition, you may configure SysBack to do so using the **Utilities Menu** option described in "Removing the Network Configuration" on page 194.

Install Additional Device Driver Support
> This option tells SysBack how much to install of what is contained in the media in the location specified by the **Install Device** option. The two options are:
>
> **Minimum**
>> Selecting this option will install only those device support filesets identified by AIX when the system was booted. This information is obtained from the file **/tmp/devices.pkgs** which is created by AIX when the system was booted. This file is not always 100% accurate regarding what device support is needed as some devices return invalid installp package names rather than individual filesets. In most cases, however, this is a reliable alternative to pre-installing all device support filesets on to a system prior to creating the backup image.
>
> **All**   Selecting this option tells SysBack to perform an install command against every item contained on the media in the specified location. This may include device support filesets or any other software that is located on the media.

Software Install Device
> This option lets you specify a CD-ROM device name, a tape device name, or a NIM **LPPSOURCE** directory name. The NIM **LPPSOURCE**

directory name provides additional device support to install during installation. This device support, if available in the specified location, will be installed in circumstances where the needed device support for this machine is contained in the boot image, not the backup image to be installed.

If this is a NIM Resource Network Boot, SysBack will automatically pulls device support from the NIM **LPPSOURCE** specified when the Network Boot client was added regardless of whether this option is edited. For more information on configuring a NIM Resource Network Boot, see Chapter 15, "Network Boot/Installation Configuration," on page 207.

Firewall Communication Ports

Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this option, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must to be specified in one of the following ways:
- As a comma separated list of ports. For example: 1670, 1671

  Note: You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.
- As a range of ports. For example: 1670-1700.

Install Server IP Address

The address of the installation server. If the boot server is also the installation server, do not change this option. If the backup media from which the client is installed exists on a different server, enter the IP address of the installation server. The default is the boot server's IP address.

Gateway Address

The address of the boot server. If the boot server is also the installation server, do not change this option. If the client is installed from server other than the network boot server and a different gateway address is required to reach the installation server, enter that gateway IP address. The default is the boot server's gateway address.

Network Device Name

If the client is installed using a network adapter different than it was booted from, enter the device name of the network adapter here. The default is "none/blank".

Subnet Mask

If the client is installed using a network different than it was booted from, enter the subnet mask, if any, required for the network adapter to contact the installation server. The default is "none/blank".

Token-Ring Speed (if applicable)

If the installation server uses a different network adapter, and the network adapter is token-ring, select the correct token-ring speed. If the boot server is also the installation server, do not set this option. The default is "none/blank".

Ethernet Interface (if applicable)
>
> If the install server uses a different network adapter, and the network adapter is ethernet, select the correct interface type. If the boot server is also the installation server, do not set this option. The default is "none/blank".

Ethernet Connection Type
>
> If the install server uses a different network adapter, and the network adapter is ethernet, select the correct connection type. If the boot server is also the installation server, do not change this option. The default is "none/blank".

Post-Install Script
>
> To assign a specific post-install script to run at the end of the installation process, enter the fully qualified path and the name of the post-install script file. The file must exist on the installation server and be readable by the client during installation. Refer to Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487 for additional information on post-install scripts. The default is "none/blank".

LVM Information file
>
> To use a customized LVM information file during client installation, enter the fully qualified path and name of the LVM information file in this field. The LVM information file must contain information that is compatible with the client. The file must exist on the installation server and be readable by the client during installation. For additional information on creating an LVM Information file, see "Creating or Editing an LVM Information File" on page 293. The default is "none/blank".

Recover Devices
>
> The "Recover Devices" option provides 3 choices: "CLASSIC" , "Y" , and "N". This is an advanced AIX administration concept that should only be manipulated by those familiar with the AIX ODM and the AIX RDA program. The default option is "CLASSIC".
>
> The "CLASSIC" option indicates that SysBack will process device configuration during the system installation process as it has always done prior to the implementation of this option. In the "CLASSIC" scenario, SysBack will merge the ODM device entries that were created and used by the AIX RAMFS during the initial phase of the system installation process, with the ODM stored in the backup image.
>
> The "Y" option indicates that the ODM entries will be recovered only from the backup image. Using this option is sometimes useful in environments where devices have been given AIX names in an order that is different than how the operating system detects those devices on boot. A common example of this is seen in environments that have multiple port RAN devices with hundreds of TTYS attached.
>
> The "N" option indicates that the ODM entries will not be recovered from the backup image. Only those devices that are detected during the system boot process will be configured. These devices will be configured with the default options. Any customized device attributes will be lost.
>
> It is important to note that widely unpredictable results can be seen when using the "Y" and "N" options depending on your system configuration, or if you are cloning, or if you are simply restoring a

backup image to the same hardware. Use this option with extreme caution. If you encounter results other than you expected after specifying the "Y" or "N" options, simply perform the system installation process again and let the process default to "CLASSIC".

Tip:

Use the "CLASSIC"option if:

- you are unfamiliar with the AIX ODM and RDA and do not have a specific need to manipulate how the operating system and SysBack detect and configure the devices
- you are cloning the backup image to a new machine that does not have exactly, 100% the same hardware configuration

Use the "Y" option if:

- you are restoring the backup image on the same machine as where the backup image was created.

Use the "N" option if:

- the state of your devices and their definitions is dramatically inconsistent. Using this option under these circumstances will cause the operating system to only configure physically detectable devices to their defaults. You may then begin redefining your other devices and device attributes from scratch.

Filename of Post First Boot Install script

The file may be located and named as you choose as long as it resides in the root volume group. This script is executed after the all data is restored as a part of the first reboot process. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well. This script must be executable before writing it to this installation diskette.

Note: You may also configure this option in the **SysBack Installation and Maintenance Main Menu** by defining it in the "Post Install Configuration Options" on page 197 menu named **Post Device Configuration Options**

4. Once all entries are complete, press Enter to confirm selections and execute your choices.

Rebuilding Network Boot Images

If software is updated or installed in the boot source, you must update or rebuild the boot image. For the Classic Boot method, the source would be the /usr filesystem of the boot server. For the NIM Resource Boot method, the source would be the NIM **SPOT** resource.

To build a network boot image:

1. From either the **Classic Boot Menu** or **NIM Resource Network Boot Menu**, select **Rebuild Boot Images**.

   Note: From the command line, type `smitty sb_updboot image`

2. Press `F4` to list the image and select an image to update.
3. Press Enter to confirm your choices.

This option can be used to update both Classic method or NIM Resource method boot images.

Removing a Network Boot/Install Client

This option removes a network boot client and all information configured for network installation from the boot server. Use this option after the client installation is complete. It prevents the client system from remotely mounting the /usr filesystem in read-only mode from the server. If there is no reason to prevent the client system from mounting /usr from the server, the client configuration may be retained, enabling the client machine to boot from the server as needed for reinstallation or to perform system maintenance.

To remove a network boot client:

1. From the **Classic Network Boot Menu**, select **Remove a Network Boot Client**.

   Note: From a command line, type smitty sb_ucfgbootclient.

2. Highlight the client and press Enter.

3. Once all entries are complete, press Enter to confirm selections and execute your choices.

NIM Resource Boot

Accessing and Configuring the NIM Resource Menus

The NIM Resource Boot menus let you:

- Install SysBack into a **SPOT** resource
- Query for SysBack installation in a **SPOT** resource
- Add or change a network boot client
- Set network install client defaults
- Rebuild network boot images.
- Remove a network boot/install client

To access the NIM Resource Boot menu, select **NIM Resource Boot** from the Network Boot/Install Configuration menu.

Note: From a command line, type smitty sb_nimboot.

Installing SysBack into a SPOT Resource

The NIM **SPOT** resource must have SysBack installed in order for the SysBack boot and installation process to succeed. It is important that SysBack is installed into the NIM SPOT using this utility rather than NIM commands. SysBack has special binaries for different levels of AIX. Using this utility to install the product ensures that the correct binaries are applied based on the AIX version of the SPOT rather than the AIX version of the system where the SPOT resides.

Note: When performing a network boot in order to restore from a Tivoli Storage Manager server, you must install the TSM client filesets using NIM commands. This utilities is designed to support only the installing of the SysBack product into the SPOT.

Use the **Install SysBack into a Spot Resource** for a first time installation of SysBack into a NIM **SPOT** resource or to update the level of SysBack installed in that **SPOT** resource.

To install SysBack into a NIM **SPOT** Resource:

1. From the **NIM Resource Boot Menu**, select **Install SysBack into a Spot Resource**.

   Note: From a command line, type `smitty sb_nimspotcust`.

2. Type the device name or directory and file name where the SysBack install image resides.

3. The following screen is displayed.

```
                    Install Sysback into Spot Resource


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                         [Entry Fields]
  *INPUT device/directory for software  /usr/sys/inst.images/tivoli.tsm.client.sysback.rte
  *NIM SPOT Resource Name      []
  *NIM LPP Source Name      []
   OVERWRITE Same or newer version?   no




F1=Help              F2=Refresh         F3=Cancel          F4=List
F5=Reset             F6=Command         F7=Edit            F8=Image
F9=Shell             F10=Exit           Enter=Do
```

Figure 114. The Install Sysback into Spot Resource Menu

The options have the following definitions:

INPUT device / directory for software
> Specify the fully qualified path and filename that represents image containing the SysBack installation fileset.
>
> If the installation image resides on other media, specify the device name that contains the installation media.

NIM SPOT Resource Name
> The NIM object name for the **SPOT** resource where SysBack will be installed. Press F4 to get a list of previously configured NIM **SPOT** resources.

NIM LPP Source Name
> The NIM object name for the **LPPSOURCE** resource that supplies the SysBack image. Press F4 to get a list of previously configured NIM **LPPSOURCE** resources.
>
> **Note:** The NIM **LPPSOURCE** resource specified should contain AIX filesets of the same AIX level as the **SPOT** resource used to install the client. For example, if the **SPOT** resource supplies boot information for an AIX 5.2 system, the corresponding **LPPSOURCE** should contain AIX filesets that are also at the AIX 5.2 level. This is not a requirement for any optional software packages installed into the **LPPSOURCE**; each package can have its own operating system compatibility requirements. The level of SysBack contained in the **LPPSOURCE** can be any level supported by the AIX level of the specified **SPOT** resource.

OVERWRITE Same or newer version?
Set this option to Yes if you want to reinstall the same, or an older version of SysBack, than exists in this SPOT resource.

4. Once all entries are complete, press Enter to confirm selections and execute your choices.

Note: The image is first copied from the specified input device or directory into the specified **LPPSOURCE** before it is installed to the specified **SPOT** resource.

Querying for SysBack Installation in SPOT Resource

This option can be used to determine if SysBack is installed in to a NIM **SPOT** resource and if so, at what level.

To query for installation:

1. From the **NIM Resource Network Boot Menu**, select **Query for SysBack Installation in SPOT Resource**.

Note: From the command line, type `smitty sb_querysb`.

2. Press Enter.

Adding or Changing a Network Boot Client

This option configures a network boot client to be booted from the server. This option generates the information necessary to boot the client using the specified NIM **SPOT** resource. This option also automatically generates a boot image for the specified client using the named NIM **SPOT** resource. SysBack obtains the information regarding the client's platform and kernel type from the previously configured NIM machine object for that client.

To update the client's boot image after installing or updating the software into the NIM **SPOT** resource used by the client, repeat this process to change and update the client's boot image.

To add or change a network boot client:

1. From the **NIM Resource Boot Menu**, select **Add or Change a Network Boot Client**.
2. Highlight the client and press Enter.
3. The following screen is displayed.

```
                        Add or Change a Network Boot Client

Type or select values in entry fields.
Press Enter AFTER making all desired changes.


                                   [Entry Fields]
  *NIM Client Name          sysback2
  *NIM SPOT Resource Name       []
  *NIM LPP Source Name         []




  F1=Help            F2=Refresh          F3=Cancel          F4=List
  F5=Reset           F6=Command          F7=Edit            F8=Image
  F9=Shell           F10=Exit            Enter=Do
```

Figure 115. The Add or Change a Network Boot Client Menu

The options have the following definitions:

NIM Client Name

The NIM machine object name for the boot client. This field cannot be edited as it was generated from input on the previous selector screen.

NIM SPOT Resource Name

The NIM **SPOT** name that SysBack will use to create the boot image for the client named above.

> **Note:** The requirements described in the NIM Resource Boot discussion in "Classic Network Boot and NIM Resource Boot" on page 207 must be followed.

NIM LPP Source Name

The NIM **LPPSOURCE** resource that SysBack uses to obtain necessary device support for the boot client when cloning from a backup image that does not contain the device support needed for this client.

4. Once all entries are complete, press Enter to confirm selections and execute your choices.

Setting the Network Install Client Defaults

If you install a client system from a network install server, you can customize installation to reduce, or even eliminate, the amount of information a user must enter to initiate the installation of the client machine. The complete elimination of all prompts is referred to as a "no-prompt install" or an "unprompted installation". This is accomplished by setting all installation information that the user is normally prompted for before actually performing the network installation.

Configure the client as a network boot client before you set the network installation defaults for that client.

To set the Network Install Client Defaults:

1. From the **NIM Resource Network Boot Menu**, select **Set Network Install Client Defaults**.

   Note: From a command line, type `smitty sb_cfginstclient`.

2. Highlight the client and press Enter.
3. The following screen is displayed.

```
                      Set Network Install Client Defaults


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

  [TOP]                                              [Entry Fields]
  *Client hostname                             sysback2.aix.dfw.ibm.c>
  Perform no-prompt installation?                    no
  Debug Logging?                                     no
  THE FOLLOWING ARE REQUIRED FOR NOPROMPT INSTALL:
  Console Device Name                                []
  Console Terminal Type (if ascii)                   []
  Non-rootvg Volume Group Option               Restore rootvg only
  Restore Device or File                             []
  Backup Sequence Number (if tape)                   []
  Remove Sysback from foreign client after install?  no
  Remove Network Config from foreign client?         no
  Install Additional Device Driver Support     None
  Software Install Device                            []
  Firewall Communication Ports                       []
  THE FOLLOWING ARE REQUIRED ONLY IF THE INSTALL SERVER DIFFERS FROM THE BOOT
  SERVER:
  [MORE...11]



F1=Help            F2=Refresh        F3=Cancel         F4=List
F5=Reset           F6=Command        F7=Edit           F8=Image
F9=Shell           F10=Exit          Enter=Do
```

Figure 116. The Set Network Install Client Defaults Menu

The options have the following definitions:

Note: If the client selected was previously configured, the fields retain their previous values by default.

Client Hostname
This field cannot be changed; it was populated from input of the previous menu screen.

Perform No-Prompt Installation
Specifies if the client to be installed will be prompted. If this field is set to "no", the installation menus will appear after a network boot. Otherwise, the installation occurs after the network boot without prompting the user, provided that all required information for the installation is also provided. The default is "no".

Debug Logging
This yes or no field indicates whether to turn on debug logging operations for troubleshooting network boot and installation problems. The default is no.

Console Device Name
To prevent the prompt shown prior to the installation menus that determines which console should be used for the installation, you must enter the name of the console device here. This may be either an LFT (graphical display) or TTY (ASCII display) device. Examples are /dev/1ft0 or /dev/tty0. If an LFT device exists on the client, it may also be selected by typing /dev/console. The default is none/blank.

Note: You must select the display, even for a No-prompt install. You will then be able to receive any error or warning messages and

allow for prompts if the default information provided is
insufficient to complete the install.

Console Terminal Type (if ASCII)

If the console device is an ASCII terminal, or tty device, you must
select a specific terminal type. This ensures that installation menus, if
required, are displayed with the correct terminal emulation. You may
enter the device type or press `F4` to display a list of all terminal types
defined on the server and select from the list. Examples of common
terminal types are "ibm3151", "tvi925", and "vt100." The default is
`none/blank`.

Non-rootvg Volume Group Option

The default is set at `Restore Rootvg Only`. The following is a
description of each option.

Restore Rootvg Only

Only the rootvg volume group will be created and restored
from the media, even if there are other volume groups defined
in the backup. At the end of the install only the rootvg will be
defined.

Restore All VGs

All volume groups that are included on the backup media will
be created and restored. Volume groups that were defined on
the original system but whose data was not included in the
backup will be created but no data will be restored.

Import Non-Rootvgs

The rootvg volume group will be created and restored. All
other volume groups will be imported from disks on the client.
This option assumes that non-rootvg volume groups already
exist on the client. You typically use this option when restoring
the rootvg volume group after a system failure and no other
volume groups have been affected.

Restore Device or File

The options which appear are those made available using **Add or
Change Client Host Access to this Server** under the **Remote Services**
menu. You must select an option from this list to prevent being
prompted for an install device or file during the installation process.
The default is `none/blank`. For more information on defining these
resource, please refer to Chapter 10, "Remote Services," on page 127.

Backup Sequence Number (if tape)

If the client is to be installed from tape, CD, or DVD, and the System
Backup to be installed is not the first System Backup on the media,
enter the Backup Sequence Number. This number must be between 1
and the total number of System Backups on the media. The default is
`none/blank`.

Remove SysBack from Foreign Client After Install

This `yes` or `no` field indicates whether to remove the SysBack program
from the system after an installation. This is useful when the user has
not purchased a license for the client that will be installed. The default
is `no`.

Remove Network Config from Foreign Client

This `yes` or `no` field indicates whether to remove network specific
information required to configure the host to the network. This option

is useful when the machine installed was cloned from a backup image of a machine that is still present on the network. The default is no.

Install Additional Device Driver Support?

This option tells SysBack how much to install of what is contained in the media in the location specified by the **Software Install Device** option. The two options are:

Minimum

Selecting this option will install only those device support filesets identified by AIX when the system was booted. This information is obtained from the file **/tmp/devices.pkgs** which is created by AIX when the system was booted. This file is not always 100% accurate regarding what device support is needed as some devices return invalid installp package names rather than individual filesets. In most cases, however, this is a reliable alternative to pre-installing all device support filesets on to a system prior to creating the backup image.

All Selecting this option tells SysBack to perform an install command against every item contained on the media in the specified location. This may include device support filesets or any other software that is located on the media.

Software Install Device

This option lets you specify a CD-ROM device name, a tape device name, or a NIM **LPPSOURCE** directory name. The NIM **LPPSOURCE** directory name provides additional device support to install during installation. This device support, if available in the specified location, will be installed in circumstances where the needed device support for this machine is contained in the boot image but not the backup image to be installed.

If this is a NIM Resource Network Boot, SysBack will automatically pulls device support from the NIM **LPPSOURCE** specified when the Network Boot client was added regardless of whether this option is edited. For more information on configuring a NIM Resource Network Boot, please refer to Chapter 15, "Network Boot/Installation Configuration," on page 207.

Firewall Communication Ports

Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this option, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must to be specified in one of the following ways:

- As a comma separated list of ports. For example: 1670, 1671

   Note: You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.

- As a range of ports. For example: 1670-1700.

Install Server IP Address

The address of the installation server. If the boot server is also the

installation server, do not change this option. If the backup media from which the client is installed exists on a different server, enter the IP address of the installation server. The default is the boot server's IP address.

Gateway Address
The address of the boot server. If the boot server is also the installation server, do not change this option. If the client is installed from server other than the network boot server and a different gateway address is required to reach the installation server, enter that gateway IP address. The default is the boot server's gateway address.

Network Device Name
If the client is installed using a network adapter different than it was booted from, enter the device name of the network adapter here. The default is "none/blank".

Subnet Mask
If the client is installed using a network different than it was booted from, enter the subnet mask, if any, required for the network adapter to contact the installation server. The default is "none/blank".

Token-Ring Speed (if applicable)
If the installation server uses a different network adapter, and the network adapter is token-ring, select the correct token-ring speed. If the boot server is also the installation server, do not set this option. The default is "none/blank".

Ethernet Interface (if applicable)
If the install server uses a different network adapter, and the network adapter is ethernet, select the correct interface type. If the boot server is also the installation server, do not set this option. The default is "none/blank".

Ethernet Connection Type
If the install server uses a different network adapter, and the network adapter is ethernet, select the correct connection type. If the boot server is also the installation server, do not change this option. The default is "none/blank".

Post-Install Script
Enter a filename to include a post installation script on the customized installation diskette. If it exists, this file will be executed at the end of the installation process before the system reboots. This can be used, for instance, to execute the sample script **/usr/lpp/sysback/scripts/ install.post_rmnet** which removes the network configuration from the restored system data to prevent any prompts at the end of the SysBack installation process.

LVM Information File
Enter a filename to include an LVM information file stored on a customized installation diskette. Doing so replaces the LVM information contained on the backup and is typically used to apply many changes to the LVM information without requiring the user to do so using the installation menus. For more information about how to create a customized LVM information file, please refer to the "Creating or Editing an LVM Information File" on page 293 section of this chapter.

Recover Devices

The "Recover Devices" option provides 3 choices: "CLASSIC" , "Y" , and "N". This is an advanced AIX administration concept that should only be manipulated by those familiar with the AIX ODM and the AIX RDA program. The default option is "CLASSIC".

The "CLASSIC" option indicates that SysBack will process device configuration during the system installation process as it has always done prior to the implementation of this option. In the "CLASSIC" scenario, SysBack will merge the ODM device entries that were created and used by the AIX RAM FS during the initial phase of the system installation process, with the ODM stored in the backup image.

The "Y" option indicates that the ODM entries will be recovered only from the backup image. Using this option is sometimes useful in environments where devices have been given AIX names in an order that is different than how the operating system detects those devices on boot. A common example of this is seen in environments that have multiple port RAN devices with hundreds of "tty" devices attached.

The "N" option indicates that the ODM entries will not be recovered from the backup image. Only those devices that are detected during the system boot process will be configured. These devices will be configured with the default options. Any customized device attributes will be lost.

It is important to note that widely unpredictable results can be seen when using the "Y" and "N" options depending on your system configuration, or if you are cloning, or even if you are simply restoring a backup image to the same hardware. Use this option with extreme caution. If you encounter results other than you expected after specifying the "Y" or "N" options, simply perform the system installation process again and let the process default to "CLASSIC".

Tip:

Use the "CLASSIC"option if:

- you are unfamiliar with the AIX ODM or the AIX RDA program and do not have a specific need to manipulate how the operating system and SysBack detect and configure the devices
- you are cloning the backup image to a new machine that does not have exactly, 100% the same hardware configuration

Use the "Y" option if:

- you are restoring the backup image on the same machine as where the backup image was created.

Use the "N" option if:

- the state of your devices and their definitions is dramatically inconsistent. Using this option under these circumstances will cause the operating system to only configure physically detectable devices to their defaults. You may then begin redefining your other devices and device attributes from scratch.

Filename of Post first boot install script

The file may be located and named as you choose as long as it resides in the root volume group. This script is executed as a part of the first reboot process after all data is restore. This script could be used to import non-rootvg volume groups that reside on RAID disks that can

not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well.

4. Once all entries are complete, press Enter to confirm selections and execute your choices.

Rebuilding Network Boot Images

If software is updated or installed in the boot source, you must update or rebuild the boot image. For the Classic Boot method, the source would be the /usr of the boot server. For the NIM Resource Boot method, the source would be the NIM **SPOT** resource.

To rebuild a network boot image:

1. From either the **Classic Network Boot Menu** or **NIM Resource Network Boot Menu**, select **Rebuild Boot Images**.

   Note: From the command line, type `smitty sb_updbootimage`.

2. Press `F4` to list the images and select an image to update.

   Note: Although you can select individual boot images to rebuild, all of the boot images associated with a single NIM **SPOT** will be rebuilt, even if you choose only one image.

3. Press Enter to confirm your choices.

Removing a Network Boot/Install Client

This option will remove a network boot client and all information configured for network installation from the boot server resources.

This affects only SysBack configurations and does not change any previously defined NIM resource information.

To remove a network boot/install client:

1. From the **NIM Resource Network Boot Menu**, select **Remove a Network Boot/Install Client**.

   Note: From a command line, type `smitty sb_ucfgbootclient`.

2. Highlight the client and press Enter.

3. Press Enter to confirm your choice.

Chapter 16. Network Installation Debugging Options

The SysBack installation process has an option that allows you to put the install into "Debug mode" so that you can diagnose any problems that arise. Once the installation process is complete, you can review that debug information or the trace files to AIX technical support for further analysis.

In the early part of a system installation process, the trace file is stored in RAM memory. Later in the process, it is written to the hard drive. However, if the system installation process hangs or a system crash occurs during the early part of the install, that trace file becomes inaccessible because it was stored in memory.

This feature will allow you to store the trace file on a remote system via NFS mounted directory rather than storing it in memory or writing it to the hard disk of the system being installed. This ensures that the trace information can be retrieved even in the even of an installation process hang, or system crash during the installation process.

This chapter describes how to configure the options necessary to store the debug file on a remote system via NFS. You can pre-configure the options prior to the backup, boot, and installation process. You may also configure these options at the time of the system installation.

Defining a Directory for Export to the Client System

To define a directory for export to the client:

1. Log in as the root user on either the network boot server or the network install server.

   Note: The network boot and network install servers can be the same physical machine.

2. From the SysBack main menu, select **Debug Options**.

   Note: From a command line, type `smitty sb_DebugConfig`.

3. Select the **NFS Configuration Options** menu and press Enter to continue.

   The following screen is displayed:

Figure 117. The NFS Configuration Options for Debugging Menu

```
          NFS Configuration Options for Debugging Menu

Move cursor to desired item and press Enter.

  Add Client Access for NFS Debugging
  Change and Show Attributes of an Exported Directory
  Remove a Directory from the Exports List



F1=Help            F2=Refresh          F3=Cancel    F8=Image
F9=Shell           F10=Exit            Enter=Do
```
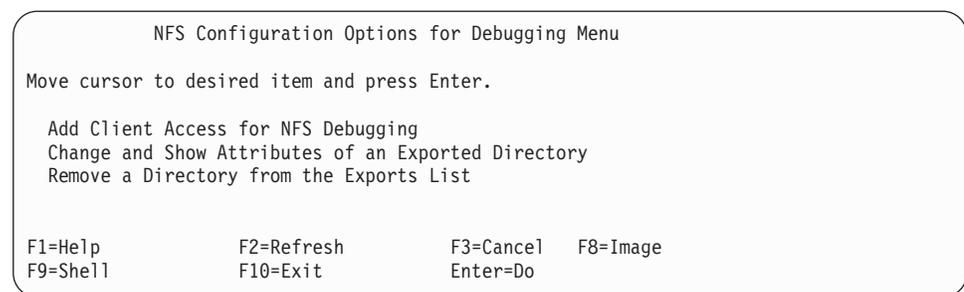
4. Select **Add Client Access for NFS Debugging** and press Enter.

The following screen is displayed:

```
Add a Directory to Exports List

Move cursor to desired item and press Enter.
 Pathname of directory to export
 Anonymouse UID                [-2]
 Public filesystem?                no
  Export directory now, system restart or both   both
 Pathname of alternate exports file       []
 Allow access for NFS version         []
 External name of directory (NFS v4 access only)  []
 Referral locations (NFS v4 access only)     []
 Replica locations             []
 Ensure primary hostname in replica list     yes
 Allow delegations?            No
 Security method 1      [sys,krb5p, krb5i,krb5]
  Mode to export directory      read-write
  Hostname list. If exported read-mostly    []
  Hosts and netgroups allowed client access   []
  Hosts allowed root access          []
 Security method 2             []
  Mode to export directory       read-write
  Hostname list. If exported read-mostly    []
  Hosts and netgroups allowed client access   []
  Hosts allowed root access         []

 F1=Help           F2=Refresh        F3=Cancel    F8=Image
 F9=Shell          F10=Exit          Enter=Do
```

Figure 118. The Add a Directory to Exports List Menu

The fields have the following definitions:

Pathname of directory to export (Required)
> Specify the fully qualified name of the directory path to export to the install client.

> **Note:** All other options listed are the standard options for the AIX **/usr/sbin/mknfsep** command. Please refer to your AIX operating system documentation for a list of all available options for this command and their definitions.

Changing and Showing Attributes of an Exported Directory

To define a directory for export to the client:

1. Log in as the root user on either the network boot server or the network install server.

   Note: The network boot and network install servers can be the same physical machine.

2. From the SysBack main menu, select **Debug Options**.

   Note: From a command line, type smitty sb_DebugConfig.

3. Select the **NFS Configuration Options** menu and press Enter to continue.

   The following screen is displayed:

Figure 119. The NFS Configuration Options for Debugging Menu

```
                    NFS Configuration Options for Debugging Menu

Move cursor to desired item and press Enter.

  Add Client Access for NFS Debugging
  Change and Show Attributes of an Exported Directory
  Remove a Directory from the Exports List


F1=Help              F2=Refresh          F3=Cancel    F8=Image
F9=Shell             F10=Exit            Enter=Do
```
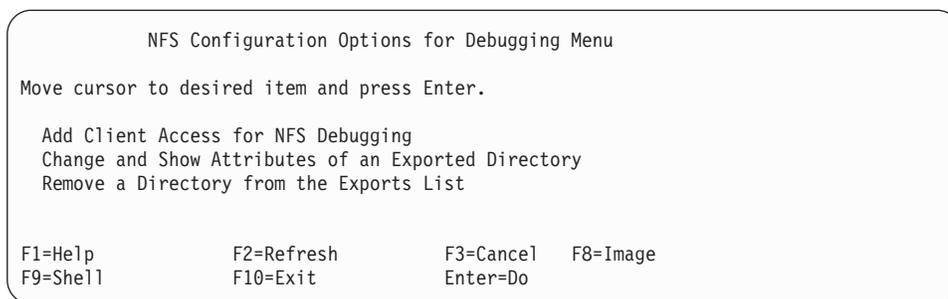
4. Select **Change and Show Attributes of an Exported Directory** and press Enter.

   The following screen is displayed:

```
        Change and Show Attributes of an Exported Directory

Move cursor to desired item and press Enter.
  Pathname of exported directory   []


F1=Help              F2=Refresh          F3=Cancel    F8=Image
F9=Shell             F10=Exit            Enter=Do
```
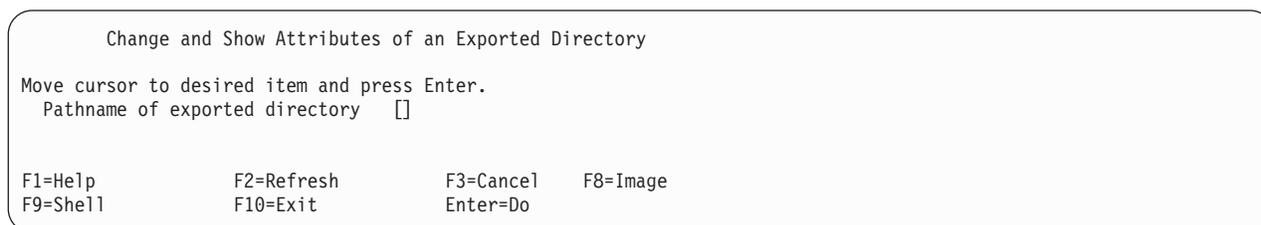
Figure 120. The Change and Show Attributes of and Exported Directory Menu

The fields have the following definitions:

Pathname of directory to export (Required)
   Specify the fully qualified name of the exported directory path to be changed.

Removing a Directory from the Exports List

To define a directory for export to the client:

1. Log in as the root user on either the network boot server or the network install server.

   Note: The network boot and network install servers can be the same physical machine.

2. From the SysBack main menu, select **Debug Options**.

   Note: From a command line, type smitty sb_DebugConfig.

3. Select the **NFS Configuration Options** menu and press Enter to continue.

   The following screen is displayed:

Figure 121. The NFS Configuration Options for Debugging Menu

```
                    NFS Configuration Options for Debugging Menu

Move cursor to desired item and press Enter.

  Add Client Access for NFS Debugging
  Change and Show Attributes of an Exported Directory
  Remove a Directory from the Exports List


F1=Help              F2=Refresh          F3=Cancel    F8=Image
F9=Shell             F10=Exit            Enter=Do
```
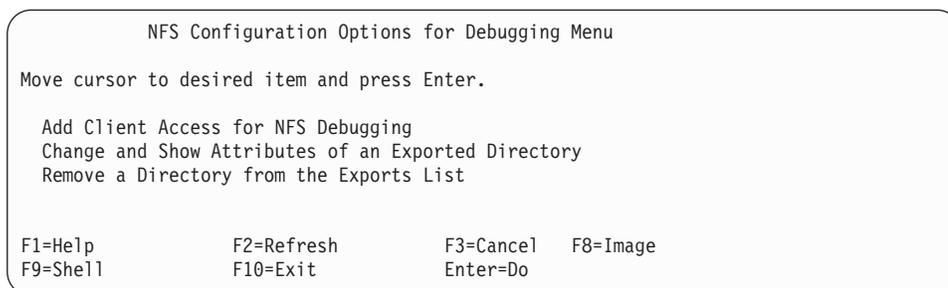
4. Select **Remove a Directory from the Exports List** and press Enter. .

The following screen is displayed:

```
              Remove a Directory from the Exports List

Move cursor to desired item and press Enter.
   Pathname of exported directory to remove []



F1=Help              F2=Refresh           F3=Cancel    F8=Image
F9=Shell             F10=Exit             Enter=Do
```

Figure 122. The Change and Show Attributes of and Exported Directory Menu

The fields have the following definitions:

Pathname of directory to export (Required)
> Specify the fully qualified name of the exported directory path to be removed.

Defining Boot Defaults for Network Install Debugging Options

To define the boot defaults for previously defined set of network installation debugging:

1. If you are defining network boot defaults, log in as the root user on either the network boot server or the network install server.

   Note: The network boot and network install servers can be the same physical machine.

   If you are defining tape or CD/DVD device boot defaults, log in as the root user on the client machine where the boot media is created.

   Note: You must accpet this step prior to creating your boot only media, full system backup, or **LVM Only Backup** in order to store the defaults on that media.

2. From the SysBack main menu, select **Debug Options**. Note: From a command line, type smitty sb_DebugConfig.

3. Select the **Add, Change, or Show Debug Boot Defaults** menu and press Enter to continue.

   The following screen is displayed:

```
Add, Change, or Show Debug Defaults

Move cursor to desired item and press Enter.

Select boot type default       tape
Client hostname         []
Path to debug directory      [trace]
Name of debug file       [debug.out]
Debug logging?          yes
Client IP address        []
Server IP address        []
Client gateway address (optional)  []
Client subnet mask (optional)    []
Network device name       [ent0]
Token-ring speed if (applicable)   []
Ethernet interface (if applicable)  []
Ethernet connection type      []


F1=Help          F2=Refresh      F3=Cancel     F8=Image
F9=Shell         F10=Exit        Enter=Do
```

Figure 123. The Add, Change, or Show Debug Boot Defaults Menu

The fields have the following definitions:

Boot Type Default (Required)
Use this option to specify the type of boot device that will be used by the client. Indicate either "C" for CD/DVD boot, "N" for network boot, or "T" for tape boot.

Client Hostname
Use this option to specify the list of client hostnames that will require read-write access to the specified NFS directory/file system.

Path to debug directory (Required)
Use this option to specify the NFS directory name on the install server where the debug/trace information will be written.

Name of debug file (Optional)

Use this option to specify the trace file name where the trace/debug output information will be written. If this field is left blank, then the default value is debug.mmddyy.out where:

- mm = month
- dd = day
- yy = year

Debug logging?
Use this option to enable the debug logging capabilities.

Client IP Address (Required)
Use this option to specify the IP address of this system that is being installed and using these defaults.

Server IP Address (Optional)
Use this option to specify the IP address of the installation server where the backup media from which the client will be installed exists.

Client Gateway Address (Optional)
Use this option to specify the address of the boot server. If the boot server is also the install server, the same value may be entered. If the client is installed from a server other than the network boot server and

a different gateway address is required to reach the install server, enter that gateway IP address. The default is the boot server's gateway address.

Client Subnet Mask (Optional)
Use this option to specify the subnet network mask required for the network adapter to contact the install server, if required, when the client is installed using a network different than that the one from which it was booted.

Network device name
If the client is installed using a network adapter different than it was booted from, enter the device name of the network adapter here. The default is "none/blank".

Token-ring speed if (applicable)
Use this option to select the correct token-ring speed for the network adapter of the install server.

Ethernet Interface (Optional)
Use this option to select the correct interface type for the network adapter of the install server.

Ethernet Connection Type (Optional)
Use this option to select the correct connection type for the network adapter of the install server.

Setting the Network Install Debugging Options from the System Installation Main Menu

If you did not pre-configure the debugging options or install defaults prior to the start of the boot and installation process, you can set them from the **SYSBACK SYSTEM INSTALLATION AND MAINTENANCE MAIN MENU** screen after the client system has been booted. To learn more about how to configure these options during the system installation process, please refer to the "Setting Debug Options" on page 203 section of Chapter 14, "System Installation and Maintenance," on page 185.

Chapter 17. Integrating to Tivoli Storage Manager

SysBack allows for the storage of its backup objects into an IBM Tivoli Storage Manager server. Backups that are stored in a Tivoli Storage Manager (TSM) server may be manipulated like any other SysBack backup. They may be listed, verified, restored, and used for system reinstallation. SysBack also provides the ability to reinstall the system with TSM Backup/Archive (BA) client backups during SysBack's boot and installation processing.

Communication with a TSM server is achieved by creating a TSM Virtual Device from within SysBack. The TSM Virtual Device acts as a user interface to the TSM API client which in turn acts as a bridge to the TSM server.

This chapter will describe the following:
- Prerequisites, Limitations, and Exclusions for Storing SysBack Backups in a TSM Server
- Basic Setup and Configuration Tasks for Storing SysBack Backups in a TSM Server
- How to Create, Change, List, and Remove the TSM Virtual Device
- How to Perform Backups to a TSM server via the TSM Virtual Device
- How to List and Verify Backups Stored in a TSM Server via the TSM Virtual Device
- How TSM Manages SysBack Backups Stored in a TSM Server
- TSM Versioning of SysBack Backup Types
- How to Exclude Objects from SysBack Backups Stored in a TSM Server
- How to Restore SysBack Backups Stored in a TSM Server via the TSM Virtual Device
- The Available Options for Reinstalling a System with SysBack and TSM
- How to Configure Network Boot Options for Use with TSM
- How to Reinstall the System Using SysBack Backups Stored in a TSM Server
- How to Reinstall the System Using TSM B/A Client Backups
- The Use of Multiple Backup and Restore Sessions
- Problem Determination Assistance

Prerequisites, Limitations, and Exclusions for Storing SysBack Backups in a TSM Server

The hardware and operating system requirements for storing backups into a Tivoli Storage Manager server are the same as the base product as defined in "System Hardware Requirements" on page 1 and "System Software Requirements" on page 1 sections. The following additional requirements are specific to interactions with Tivoli Storage Manager:
- A previously configured Tivoli Storage Manager server must be at level 5.4.0 or higher
- The 32-bit TSM API client must be installed and at level 5.4.0 or higher
- When combining TSM B/A Client backups with SysBack boot and installation processing, you must use a 5.4.0 or higher version of the TSM Backup/Archive client.

- The Tivoli Storage Manager node name used for SysBack backups must be registered on the Tivoli Storage Manager server and configured to use the `passwordaccess generate` option.
- Only JFS and JFS2 file systems are supported for all of the SysBack backup types
- The SysBack File or Directory backup type may also be used to backup CD-ROM and NFS file systems
- All backup, restore, list, verify, and query operations must be performed as the root user

The following limitations and exclusions apply to interaction with Tivoli Storage Manager:

- SysBack backups should not be used to backup Tivoli Storage Manager HSM managed file systems. You will need to explicitly specify any HSM managed file system in the SysBack exclude list. For detailed information on SysBack exclude lists, please refer to Chapter 11, "Exclude Lists," on page 145.

  Note: Using SysBack to back up HSM managed file systems will cause all of the migrated data to be recalled for the backup operation. This could cause lengthy backup times. Also, there may not be enough space in the file system to recall all of the migrated data. Use the TSM Backup-Archive Client to backup HSM managed file systems instead.

- LAN Free backups are not supported
- `COMMMethod TCPIP` is the only supported Tivoli Storage Manager communication method
- GPFS file systems are not supported by SysBack Note: The TSM Backup-Archive Client supports the backup of GPFS file systems.
- Veritas (VxFS) file systems are not supported by SysBack
- AFS and DFS file system structures can not be recreated from backups. If the root user has the appropriate AFS or DFS permissions, then SysBack can backup the data.

  Note: The TSM Backup-Archive Client supports the backup of AFS and DFS file systems.

- Compression should not be set from within the SysBack backup commands when the backup destination is a Tivoli Storage Manager server. Compression of data is controlled through Tivoli Storage Manager configuration options.
- Files, directories, file systems, or logical volumes that you would like excluded from SysBack backup processing must be defined in the SysBack exclude list. Tivoli Storage Manager exclude processing does not apply to SysBack backup processing. For more information on defining SysBack exclude lists, please refer to Chapter 11, "Exclude Lists," on page 145.

Basic Setup and Configuration Tasks for Storing SysBack Backups in a TSM Server

In order to perform backup, list, verify, query, or restore operations using a Tivoli Storage Manager server as a Virtual Device, you must perform the following configuration tasks:

Register a Tivoli Storage Manager Node

Before you may perform any communications with a Tivoli Storage Manager server, you must first register a Tivoli Storage Manager node and define a

password. For example, you could type the following Tivoli Storage Manager server command via the Tivoli Storage Manager Administrative Client interface:

```
dsmadmc> register node lasher password domain=special
```

Note: There are several options available when registering a node. For more detailed information related to registering nodes to a Tivoli Storage Manager server, please refer to the IBM Tivoli Storage Manager for AIX: Administrator's Guide or the IBM Tivoli Storage Manager for AIX: Administrator's Reference

The password will be initialized when the Tivoli Storage Manager virtual device is created. If your password is already initialized, such as when you are using the same node name as your TSM Backup-Archive Client, it will be necessary for you to provide that password when creating the virtual device definition.

Install the API Client

You must install the version 5.4.0 (or later) Tivoli Storage Manager 32-bit API client for use with SysBack operations.

Note: Please refer to IBM Tivoli Storage Manager documentation file for detailed API installation instructions.

Configure the Tivoli Storage Manager Client System Options File for SysBack Use

You must add, update, or select an existing server stanza in the **/usr/tivoli/tsm/client/api/bin/dsm.sys** file. Operations between SysBack and Tivoli Storage Manager require at least this minimum information in the `dsm.sys` file:

```
****************************************************************************
* Tivoli Storage Manager                                                  *
* Sample Client System Options file for AIX and SunOS (dsm.sys.smp)    *
****************************************************************************
* This file contains the minimum options required to get started using TSM.
 Copy the * dsm.sys.smp to dsm.sys. In the dsm.sys file, enter the
 appropriate values for each * option listed below and remove the
 leading asterisk (*) for each one.
* If your client node communicates with multiple TSM servers,
 be sure to add a stanza, * beginning with the SERVERNAME option,
 for each additional server.
****************************************************************************
SErvername lasher_main
  NODename lasher
  COMMMethod TCPIP
  TCPPort 1500
  TCPServeraddress tsmserver.your.domain.com
  PASSWORDAccess generate
```

The following Tivoli Storage Manager Client Options are also supported with SysBack backups:

- COMMMethod
- COMMRESTARTDuration
- COMMRESTARTInterval
- COMPRESSAlways
- COMPRESSIon
- FROMNode
- INCLexcl

> **Note:** Only 5 Include statements are supported in this file. Please see the section **Binding and Rebinding Backups to Tivoli Storage Manager Management Classes** for more details.

- INCLUDE

> **Note:** Only 5 Include statements are supported in this file. Please see the section **Binding and Rebinding Backups to Tivoli Storage Manager Management Classes** for more details.

- MAILprog
- NODename
- PASSWORDAccess

> **Note:** Only the generate value is supported with this option.

- PASSWORDDIR
- SErvername
- TCPBuffsize
- TCPNodelay
- TCPPort
- TCPServeraddress
- TPCPWindowsize
- Defaultserver
- Asnodename
- Virtualnodename

> **Note:** For more detailed information on configuring the dsm.sys and dsm.opt files, and an explanation of the uses for each of the referenced options, please refer to the IBM Tivoli Storage Manager for UNIX and Linux: Backup-Archive Clients Installation and User's Guide.

Set Tivoli Storage Manager Environment Variables for Use by SysBack

The Tivoli Storage Manager API client provides the following environment variables:

- DSMI_CONFIG: The fully qualified name for the client options file usually named **dsm.opt**. Setting this variable is not supported with SysBack. SysBack will always set this variable to **/usr/lpp/sysback/tsm/dsm.opt.tsmXX** where X represents the Tivoli Storage Manager virtual device number.
- DSMI_DIR: The path that contains the **dsm.sys**, **dsmtca**, and the **en_US** subdirectory. Setting this variable is not supported with SysBack. SysBack will always look to the default API installation directory of **/usr/tivoli/tsm/client/api/ bin** to locate these items in order to allow the bare machine recovery functions.
- DSMI_LOG: The path that points to the API error log. You may configure this variable to designate the location and filename of the API error log. If this variable is not set, the API error log for SysBack operations will be located in **/usr/lpp/sysback/sbtsmerror.log**.

> **Note:** This does not log the output of the SysBack command processing. This only logs the information for the API communications between the SysBack command processing and the Tivoli Storage Manager server. For more information related to process logging, please refer to Chapter 21, "Logging," on page 319.

Create the Tivoli Storage Manager Virtual Device

For detailed information related to the Tivoli Storage Manager virtual device, please refer to the section Creating, Listing, Changing, and Removing the Tivoli Storage Manager Virtual Device for SysBack

Additional Configuration for System Recovery

In order to perform a full system recovery or system installation from a SysBack backup stored in a TSM server or using TSM B/A Client Backups, you must execute the following configuration tasks:

- Configure the system to be a SysBack Network Boot Client as explained in Chapter 15, "Network Boot/Installation Configuration," on page 207.
- Configure the Tivoli Storage Manager Network Install Client Defaults as explained in **Configuring Network Boot Options for Use with TSM**.

Creating, Listing, Changing, and Removing the Tivoli Storage Manager Virtual Device

All SysBack backup, restore, list, verify, and query operations communicate with the designated Tivoli Storage Manager server via a Tivoli Storage Manager Virtual Device. A virtual device allows you to logically define a Tivoli Storage Manager server for communications with SysBack operations.

Creating a Tivoli Storage Manager Virtual Device

To access the TSM Virtual Device configuration menus:

1. Log in as the root user.
2. Type smitty sysback and press Enter.
3. Select **Tivoli Storage Manager Configuration** and press Enter.

   The following screen is displayed:

Figure 124. Tivoli Storage Manager Configuration Menu
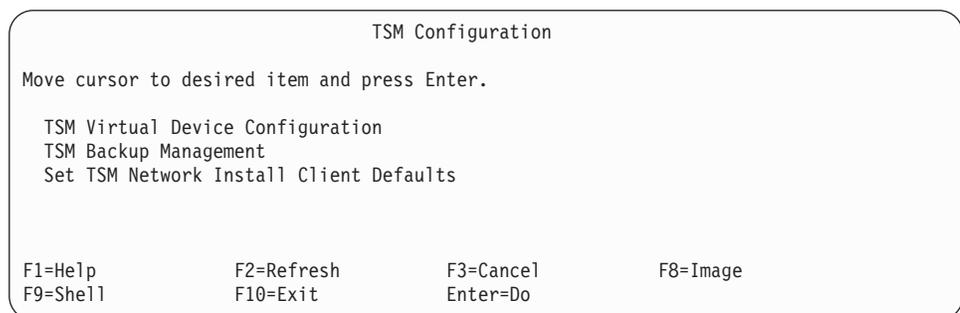
```
                            TSM Configuration

Move cursor to desired item and press Enter.

  TSM Virtual Device Configuration
  TSM Backup Management
  Set TSM Network Install Client Defaults



F1=Help              F2=Refresh          F3=Cancel           F8=Image
F9=Shell             F10=Exit            Enter=Do
```

4. Select **Tivoli Storage Manager Virtual Device Configuration** and press Enter.

   The following screen is displayed:

Figure 125. The TSM Virtual Device Configuration Menu

```
                     TSM Virtual Device Configuration

Move cursor to desired item and press Enter.
  Add a TSM Virtual Device
  Change and Existing TSM Virtual Device
  List TSM Virtual Devices
  Remove a TSM Virtual Device




F1=Help              F2=Refresh          F3=Cancel          F8=Image
F9=Shell             F10=Exit            Enter=Do
```
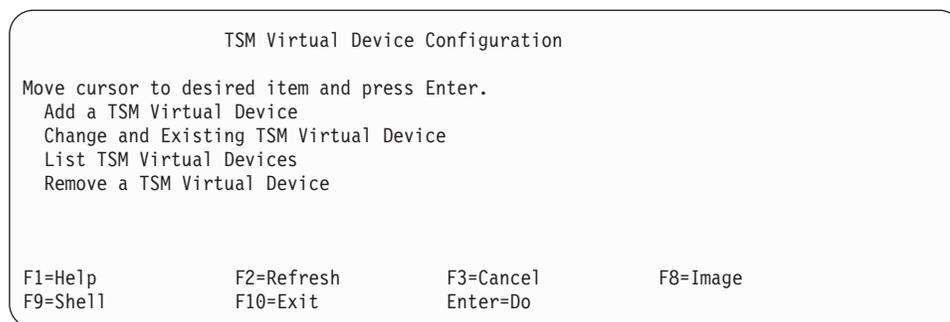
5. Select **Add a Tivoli Storage Manager Virtual Device** and press Enter.

6. Highlight the desired Tivoli Storage Manager server name stanza when prompted at the **Select a TSM Server** dialogue and press Enter.

   Note: The list of Tivoli Storage Manager server name stanzas is generated from the contents of the **/usr/tivoli/tsm/client/api/bin/dsm.sys** file.

   The following screen is displayed:

Figure 126. The Add Tivoli Storage Manager Virtual Device Menu

```
                Add TSM Virtual Device


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                               [Entry Fields]
  TSM Server Name                              lasher1_main
  Client Node Password                         []



F1=Help              F2=Refresh          F3=Cancel          F4=List
F5=Reset             F6=Command          F7=Edit            F8=Image
F9=Shell             F10=Exit            Enter=Do
```
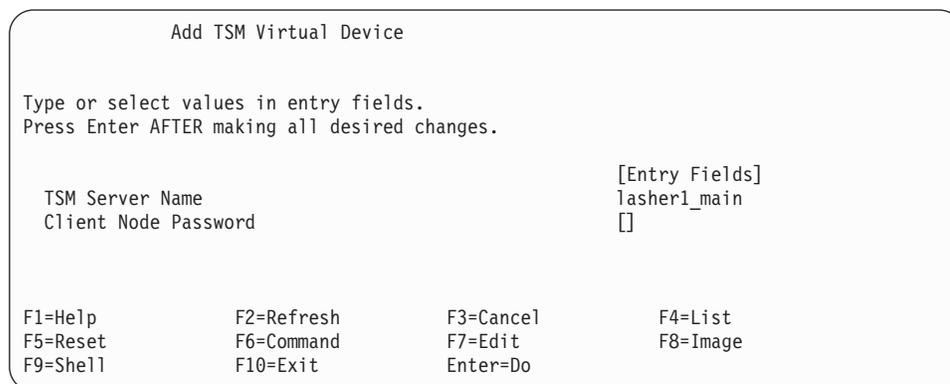
7. Enter the password that corresponds to the node name defined in this server stanza in the **Password** field.

   Note: You should be aware of the following information related to the password field:

   a. If this is the first connection to the Tivoli Storage Manager server for this node name, the password will be encrypted and stored in **/etc/security/adsm** or the location specified with the **PASSWORDIR** option in the **dsm.sys** file.

   b. If connections to the Tivoli Storage Manager server have previously been established by this, or any other Tivoli Storage Manager client using this node name, you must enter the password that was previously stored in **/etc/security/adsm** or the location specified with the **PASSWORDDIR** option in the **dsm.sys** file. If you do not know this password, you have two options:

      1) i. Specify the password to an administrator id created for this node name which has OWNER access.

      2) Log in to the Tivoli Storage Manager server and issue the command: update node node_name new_password before attempting to create the Tivoli Storage Manager Virtual Device.

> **Note:** For more information regarding the update node
> command, please refer to IBM Tivoli Storage Manager for
> AIX: Administrator's Reference.

Listing a Tivoli Storage Manager Virtual Device

To access the TSM Virtual Device configuration menus:

1. Log in as the root user.
2. Type `smitty sysback` and press Enter.
3. Select **Tivoli Storage Manager Configuration** and press Enter

   The following screen is displayed:

Figure 127. The Tivoli Storage Manager Configuration Menu
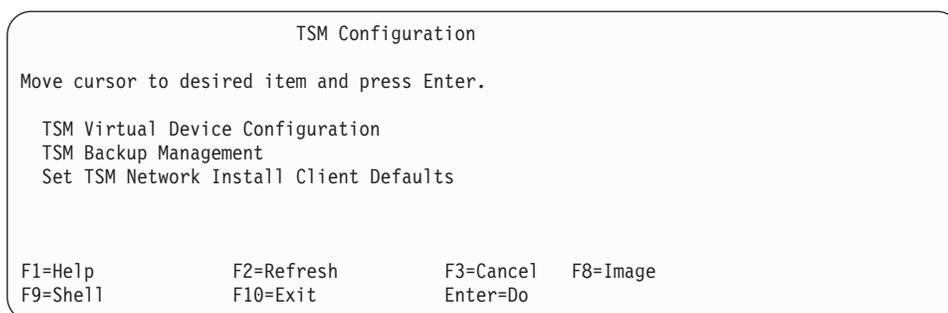
```
                          TSM Configuration

Move cursor to desired item and press Enter.

   TSM Virtual Device Configuration
   TSM Backup Management
   Set TSM Network Install Client Defaults



F1=Help              F2=Refresh           F3=Cancel    F8=Image
F9=Shell             F10=Exit             Enter=Do
```

4. Select **Tivoli Storage Manager Virtual Device Configuration** and press Enter.

   The following screen is displayed:

Figure 128. The Tivoli Storage Manager Virtual Device Configuration Menu

```
                    TSM Virtual Device Configuration

Move cursor to desired item and press Enter.
   Add a TSM Virtual Device
   Change and Existing TSM Virtual Device
   List TSM Virtual Devices
   Remove a TSM Virtual Device


F1=Help              F2=Refresh           F3=Cancel           F8=Image
F9=Shell             F10=Exit             Enter=Do
```
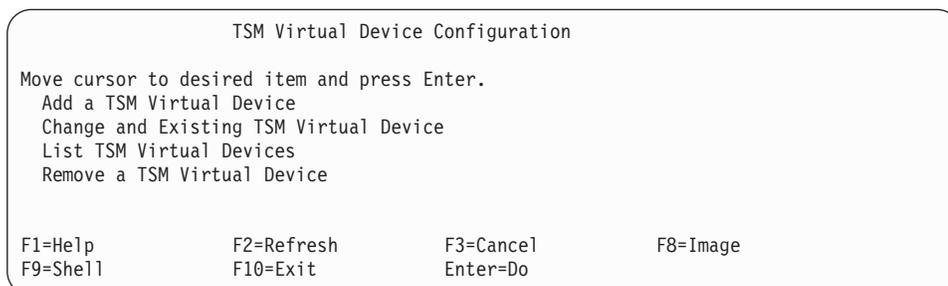
5. Select **List Tivoli Storage Manager Virtual Devices** and press Enter.

The list will show **Tivoli Storage Manager Virtual Device** name and the
corresponding Tivoli Storage Manager `servername` stanza associated with it.

Changing the Tivoli Storage Manager Virtual Device

To access the TSM Virtual Device configuration menus:

1. Log in as the root user.
2. Type `smitty sysback` and press Enter.
3. Select **Tivoli Storage Manager Configuration** and press Enter

   The following screen is displayed:

Figure 129. The Tivoli Storage Manager Configuration Menu
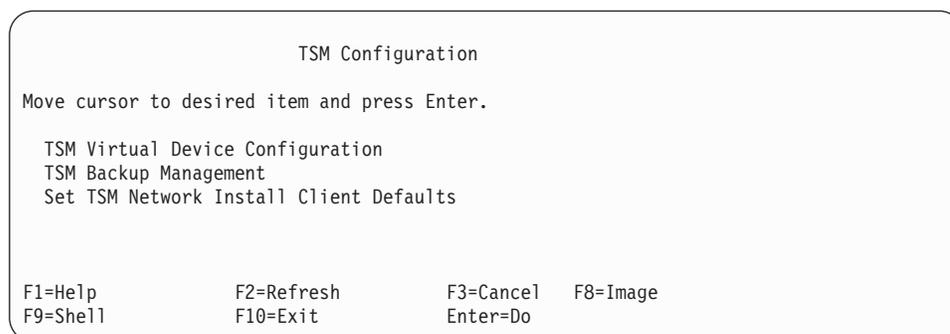
```
                        TSM Configuration

Move cursor to desired item and press Enter.

   TSM Virtual Device Configuration
   TSM Backup Management
   Set TSM Network Install Client Defaults



F1=Help             F2=Refresh          F3=Cancel   F8=Image
F9=Shell            F10=Exit            Enter=Do
```

4. Select **Tivoli Storage Manager Virtual Device Configuration** and press Enter.

   The following screen is displayed:

Figure 130. The Tivoli Storage Manager Virtual Device Configuration Menu

```
                   TSM Virtual Device Configuration

Move cursor to desired item and press Enter.
   Add a TSM Virtual Device
   Change and Existing TSM Virtual Device
   List TSM Virtual Devices
   Remove a TSM Virtual Device


F1=Help             F2=Refresh          F3=Cancel        F8=Image
F9=Shell            F10=Exit            Enter=Do
```
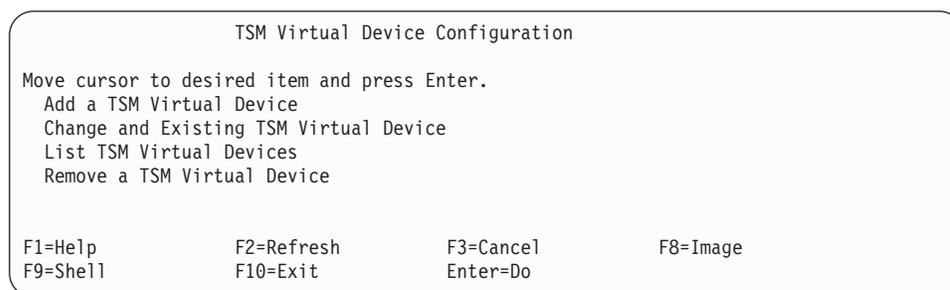
5. Select **Change an Existing Tivoli Storage Manager Virtual Device** and press Enter.

6. Highlight the desired virtual device to edit at the **Select a Tivoli Storage Manager Virtual Device** dialog and press Enter.

   The following screen is displayed:

Figure 131. The Change an Existing Tivoli Storage Manager Virtual Device

```
              Change an Existing TSM Virtual Device


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                    [Entry Fields]
   TSM Virtual Device Name    tsm0
   TSM Server Name            [lasher1_main]+
   Client Node Password       []


F1=Help             F2=Refresh          F3=Cancel   F4=List
F5=Reset            F6=Command          F7=Edit     F8=Image
F9=Shell            F10=Exit            Enter=Do
```
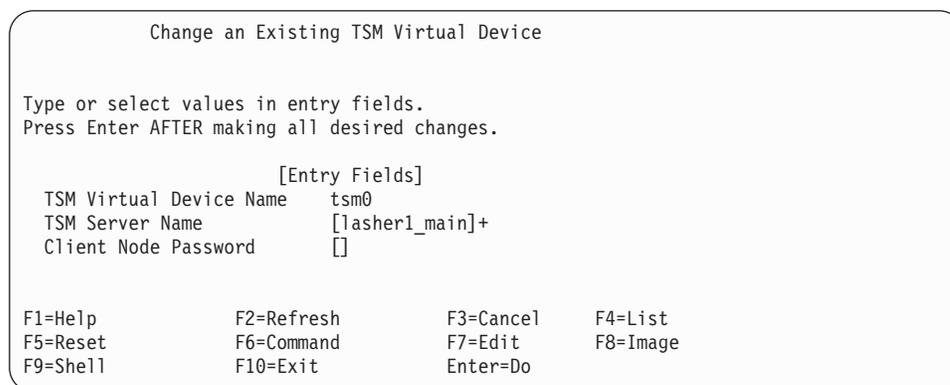
7. Change the Tivoli Storage Manager servername listed in the **TSM Server Name** field if desired.

> **Note:** The list of Tivoli Storage Manager server name stanzas is generated from the contents of the **/usr/tivoli/tsm/client/api/bin/dsm.sys** file.

8. Enter the password for the client node name in the **Client Node Password** field.

9. Press Enter.

Removing the Tivoli Storage Manager Virtual Device

To access the TSM Virtual Device configuration menus:

1. Log in as the root user.
2. Type smitty sysback and press Enter.
3. Select **Tivoli Storage Manager Configuration** and press Enter

   The following screen is displayed:

Figure 132. The Tivoli Storage Manager Configuration Menu
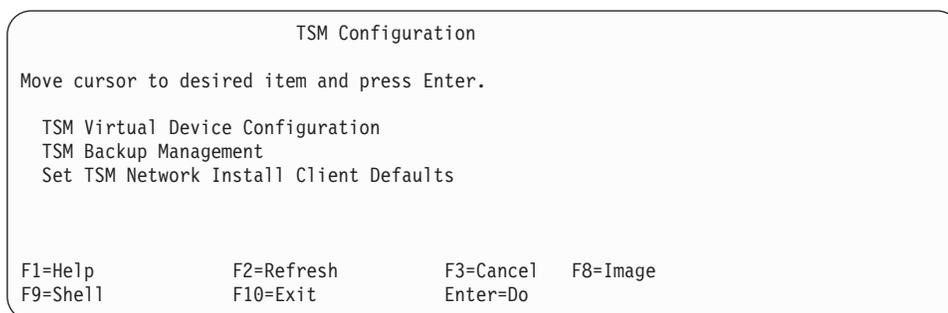
```
                      TSM Configuration

Move cursor to desired item and press Enter.

  TSM Virtual Device Configuration
  TSM Backup Management
  Set TSM Network Install Client Defaults



F1=Help              F2=Refresh          F3=Cancel   F8=Image
F9=Shell             F10=Exit            Enter=Do
```

4. Select **Tivoli Storage Manager Virtual Device Configuration** and press Enter.

   The following screen is displayed:

Figure 133. The Tivoli Storage Manager Virtual Device Configuration Menu
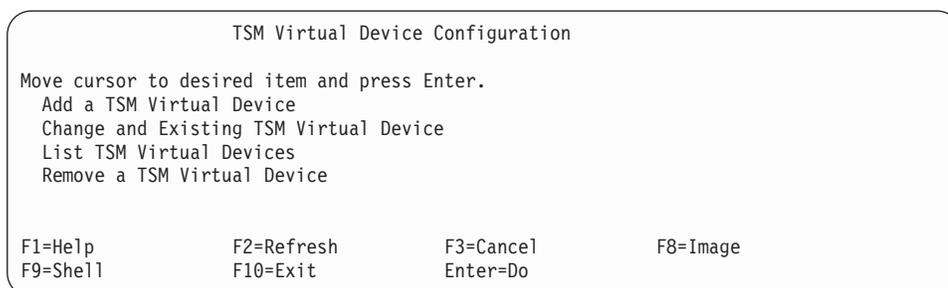
```
                   TSM Virtual Device Configuration

Move cursor to desired item and press Enter.
  Add a TSM Virtual Device
  Change and Existing TSM Virtual Device
  List TSM Virtual Devices
  Remove a TSM Virtual Device


F1=Help              F2=Refresh          F3=Cancel          F8=Image
F9=Shell             F10=Exit            Enter=Do
```

5. Select **Remove a Tivoli Storage Manager Virtual Device** and press Enter
6. Highlight the desired virtual device to remove from the **Select a Tivoli Storage Manager Virtual Device** dialog and press Enter.

Performing Backups to a TSM Server via the TSM Virtual Device

Initiating backups to a Tivoli Storage Manager server is just like performing any other SysBack backup. Backup operations are initiated by the standard backup commands. However, rather than specifying a directory, tape, or CD/DVD drive as the backup device, the Tivoli Storage Manager virtual device is specified. Some backup command options are not valid when used for backups to a Tivoli Storage

Manager server. If an invalid option is specified, a warning message will be issued and the invalid option will be ignored. For additional information regarding SysBack backups, please refer toChapter 4, "Performing Backups," on page 19 and to Appendix A, "Commands," on page 351.

Note: Each image that comprises a SysBack backup is sent to the Tivoli Storage Manager server as a single transaction. Therefore, Tivoli Storage Manager tuning options specific to client transactions are not applicable to this type of backup.

To define an exclude list for a backup processing when using a Tivoli Storage Manager server as virtual device, it is important to remember that exclude lists must be defined from within SysBack since SysBack backup commands are executing the process. Exclude statements placed in the **dsm.sys** file, or in a Tivoli Storage Manager include/exclude file are not processed by the SysBack backup commands. For additional information regarding SysBack exclude lists, please refer to Chapter 11, "Exclude Lists," on page 145.

Listing and Verifying Backups Stored in a TSM Server via the TSM Virtual Device

The list and verify functions within SysBack remain unchanged in regard to backups stored in a Tivoli Storage Manager server. The list option will attempt to read the table of contents file for the selected backup, where as, the verify option will attempt to read the actual backup image(s). However, rather than specifying a directory, tape, or CD/DVD drive as the backup device, the Tivoli Storage Manager virtual device is specified. For more information regarding listing and verifying backups, please refer to Chapter 20, "Listing or Verifying Backups," on page 313.

Using Multiple Backup and Restore Sessions

You may initiate multiple backup or restore sessions using a Tivoli Storage Manager virtual device provided that each session is for a unique backup type. For example, you may perform a volume group level backup and a file system level backup concurrently. However, you may not perform two volume group backups concurrently.

Failure to adhere to this limitation could result in unpredictable, undesirable results and will not be supported.

TSM Management of SysBack Backups Stored in a TSM Server

This section contains information about the following concepts:
- Querying Tivoli Storage Manager Backup Images
- Querying Current Management Class Bindings
- Removing a Tivoli Storage Manager Backup Image
- Querying File Spaces on the TSM Server

Querying Tivoli Storage Manager Backup Images

You may query information about the SysBack backup objects stored in a Tivoli Storage Manager server.

To list the backup objects stored in a Tivoli Storage Manager server:

1. Log in as the root user.
2. Type `smitty sysback` and press Enter.
3. Select **Tivoli Storage Manager Configuration** and press Enter.

   The following screen is displayed:

Figure 134. The TSM Configuration Menu
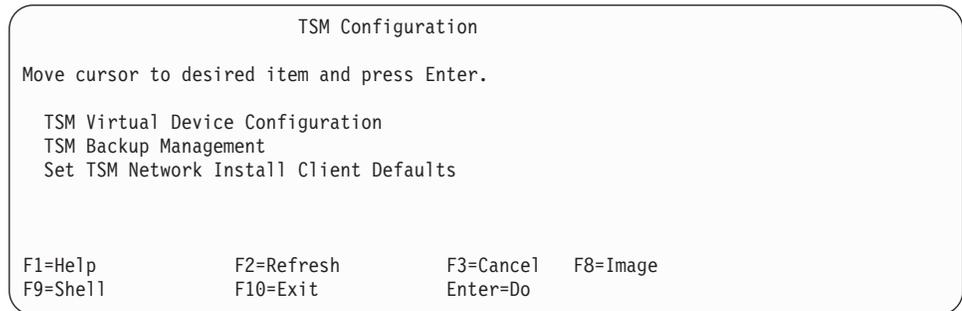
```
                        TSM Configuration

Move cursor to desired item and press Enter.

  TSM Virtual Device Configuration
  TSM Backup Management
  Set TSM Network Install Client Defaults



F1=Help              F2=Refresh           F3=Cancel   F8=Image
F9=Shell             F10=Exit             Enter=Do
```

4. Select **Tivoli Storage Manager Backup Management** and press Enter.

   The following screen is displayed:

Figure 135. The Tivoli Storage Manager Backup Management Menu

```
                      TSM Backup Management

Move cursor to desired item and press Enter.

  Query TSM Backup Images
  Query Current Management Bindings
  Remove a TSM Backup Image



F1=Help              F2=Refresh           F3=Cancel   F8=Image
F9=Shell             F10=Exit             Enter=Do
```
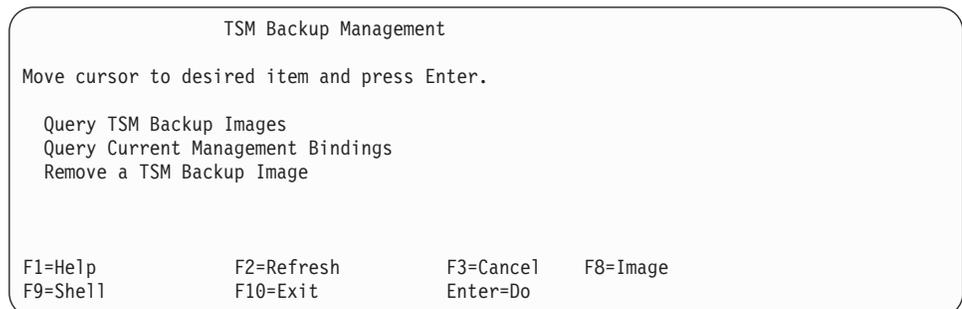
5. Select **Query Tivoli Storage Manager Backup Images** and press Enter.
6. Highlight the virtual device that represents the Tivoli Storage Manager server connection to query at the **Select a TSM Virtual Device dialog** and press Enter.

   The following screen is displayed:

Figure 136. Query Tivoli Storage Manager Backup Images Menu

```
          Query TSM Backup Images


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                  [Entry Fields]
  TSM Virtual Device Name      tsm0 +
  List Option                  All+
  Backup Type                  All+
  TSM Backup Image ID          []


F1=Help            F2=Refresh         F3=Cancel     F4=List
F5=Reset           F6=Command         F7=Edit       F8=Image
F9=Shell           F10=Exit           Enter=Do
```

The fields have the following definitions:

TSM Virtual Device (Required)
>   Specify the virtual device that represents the connection information for
>   the Tivoli Storage Manager server as configured in the
>   **/usr/tivoli/tsm/client/api/bin/dsm.sys** file.
>
>   **Note:** The value for this field was populated from the entry made in
>   the previous dialog prompt. This value may also be changed
>   from this screen.

List Option (Optional)
>   Specify the state of the backups that you would like to query. The
>   default is ALL. The available options are:

Active Active backup versions are the most recent copy of a backup type
stored in the Tivoli Storage Manager server. There can be only one
active version per backup type.

>   **Note:** For more information on active and inactive backup versions,
>   please refer to the IBM Tivoli Storage Manager for AIX:
>   Administrator's Guide.

Open Open backups represent currently running backup processes, or partial
backup images created by an abnormally terminated backup process.

>   **Note:** Open backups listed that do not correspond to an actively
>   running backup process should be removed to avoid versioning
>   once the next backup process for that backup type is initiated.

All This option will list all active, inactive, and open backups for the
backup type specified. This option is ignored when the Tivoli Storage
Manager **Backup Image ID** is specified and required when specifying
the **Backup Type**.

>   **Note:** Inactive backup versions are backups that are not the most recent
>   backup for that backup type. There may be multiple inactive
>   versions for each backup type. The number of inactive versions
>   is determined by the backup copy group defined on the Tivoli
>   Storage Manager server. For more information regarding active
>   and inactive backup versioning, please refer to the IBM Tivoli
>   Storage Manager for AIX: Administrator's Guide. For more
>   information related to backup copy groups, please refer to the

IBM Tivoli Storage Manager for AIX: Administrator's Guide and the IBM Tivoli Storage Manager for AIX: Administrator's Reference.

Backup Type (Optional)
Specify the type of backup that you would like to query. The default is "ALL". The available options are:

System
Specify this option to display only Full System (Installation Image) backups.

Volume Group
Specify this option to display only Volume Group level backups.

Filesystem
Specify this option display only File System level backups.

Logical Volume
Specify this option display only Logical Volume level backups.

File or Directory
Specify this option to display only File or Directory level backups.

All Specify this option to display all backup types. This option is ignored when the Tivoli Storage Manager **Backup Image ID** is specified and is required when specifying **List Option**

Tivoli Storage Manager Backup Image ID (Optional)
Specify the unique object id for the backup stored in the Tivoli Storage Manager server. When specifying this option, the **List Option** and **Backup Type** are ignored.

The output result when using the **List Option** and **Backup Type** will look similar to the following:

```
 Backup ID  Type  Active?  Open?    Management Class   Backup Date
 ----------- ----  -------  -------  -----------------  -------------------
     0.9527  FD    Yes      No       DEFAULT            02/14/2003 10:01:09
```

The possible values for the **Type** field in the display output are:

- SB: Full System (Installation Image) backup
- VG: Volume Group level backup
- FS: File System level backup
- LV: Logical Volume level backup
- FD: File/Directory level backup

The output result when using the Backup Image ID option will look similar to the following:

```
 Name                            Size (MB)
 ------------------------------- ---------
 /TOC                                    5
 /hd4                                    7
 /lv11                                   2
 /hd3                                    2
 /hd9var                                 4
 /sblv                                   4
```

Querying Current Management Class Bindings

You may query the current management class bindings from within SysBack. The management class bindings are obtained from the server name stanza in the

dsm.sys file that is associated with the specified Tivoli Storage Manager virtual device. If no bindings are specified, the value default is returned.

Note: SysBack automatically creates the necessary **dsm.opt** file when the Tivoli Storage Manager virtual device is created. It will be named **/usr/lpp/sysback/tsm/dsm.opt.tsmX** where X represents the Tivoli Storage Manager virtual device number.

To determine the current management class bindings:

1. Log in as the root user.
2. Type smitty sysback and press Enter.
3. Select **Tivoli Storage Manager Configuration** and press Enter.

   The following screen is displayed:

Figure 137. The TSM Configuration Menu
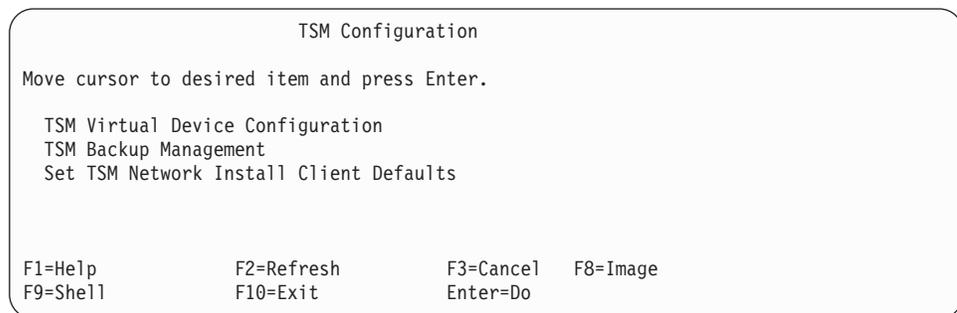
```
                      TSM Configuration

Move cursor to desired item and press Enter.

   TSM Virtual Device Configuration
   TSM Backup Management
   Set TSM Network Install Client Defaults




F1=Help              F2=Refresh           F3=Cancel    F8=Image
F9=Shell             F10=Exit             Enter=Do
```

4. Select **Tivoli Storage Manager Backup Management** and press Enter.

   The following screen is displayed:

Figure 138. The Tivoli Storage Manager Backup Management Menu

```
                      TSM Backup Management

Move cursor to desired item and press Enter.

   Query TSM Backup Images
   Query Current Management Bindings
   Remove a TSM Backup Image




F1=Help              F2=Refresh           F3=Cancel    F8=Image
F9=Shell             F10=Exit             Enter=Do
```
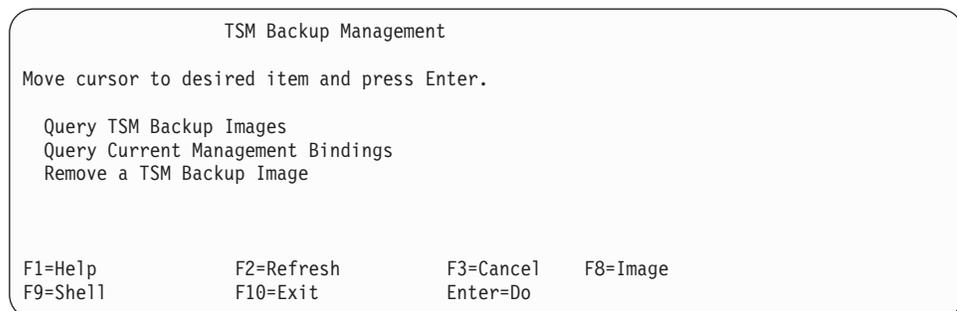
5. Select **Query Current Management Bindings** and press Enter.
6. Highlight the virtual device to query at the **Select a TSM Virtual Device dialog** and press Enter.

   The resulting output will look similar to the following:

```
                       COMMAND STATUS
Command: OK            stdout: yes            stderr: no
Before command completion, additional instructions   may appear below.


Backup Type   Management Class
-----------   ----------------------------------------
SB            DEFAULT
VG            DEFAULT
LV            DEFAULT
FS            DEFAULT
FD            DEFAULT
```

The possible values for the **Type** field in the display output are:

- SB: Full System (Installation Image) backup
- VG: Volume Group level backup
- FS: File System level backup
- LV: Logical Volume level backup
- FD: File/Directory level backup

Removing a Tivoli Storage Manager Backup Image

When storing SysBack backups into a Tivoli Storage Manager server, it is not required to manually delete a backup image from the Tivoli Storage Manager server. Tivoli Storage Manager expiration rules for the copy group that the SysBack node is associated with will determine when backup images are deleted. However, it is possible to selectively remove a backup image from a Tivoli Storage Manager server manually.

To remove a Tivoli Storage Manager Backup Image:

1. Log in as the root user.
2. Type `smitty sysback` and press Enter.
3. Select **Tivoli Storage Manager Configuration** and press Enter.

   The following screen is displayed:

Figure 139. The TSM Configuration Menu

```
                     TSM Configuration

Move cursor to desired item and press Enter.

  TSM Virtual Device Configuration
  TSM Backup Management
  Set TSM Network Install Client Defaults



F1=Help            F2=Refresh         F3=Cancel   F8=Image
F9=Shell           F10=Exit           Enter=Do
```

4. Select **Tivoli Storage Manager Backup Management** and press Enter.

   The following screen is displayed:

Figure 140. The Tivoli Storage Manager Backup Management Menu

```
                    TSM Backup Management

Move cursor to desired item and press Enter.

  Query TSM Backup Images
  Query Current Management Bindings
  Remove a TSM Backup Image



F1=Help              F2=Refresh           F3=Cancel    F8=Image
F9=Shell             F10=Exit             Enter=Do
```

5. Select **Remove a Tivoli Storage Manager Backup Image** and press Enter.
6. Highlight the virtual device to query at the **Select a Tivoli Storage Manager Virtual Device** dialog and press Enter.
7. Highlight the Tivoli Storage Manager backup image ID to remove and press enter to confirm your choice.

Querying File Spaces on the TSM Server

To determine or review the file space information related to backups with SysBack, issue the command:

```
tsm> query filespace nodename *
```

from a TSM administrative command prompt.

Be aware that using the same Tivoli Storage Manager node name for both the TSM Backup-Archive Client and the SysBack backup client will show different file space results than if they were separate. Please see the example below.

```
tsm> query filespace

  Num Last Incr Date Type File Space Name
  --- -------------- ---- ---------------
  1 00/00/00 00:00:00 API:TSMVFS /TSM4SBR
  2 00/00/00 00:00:00 JFS /home/tempvg2fs1
```

All backups created with SysBack will have a file space type of API:TSMVFS and a file space name of /TSM4SBR. However, backups created using the TSM Backup-Archive Client will have a file space type denoted by type of file system where the backup data resided, and the file space name will be the root of that file system or virtual mount point name.

Binding and Rebinding SysBack Backups to Tivoli Storage Manager Management Classes

Associating backups to one or more TSM management classes other than the default management class can be achieved via binding. This section describes the unique circumstances of binding backups initiated via SysBack backup commands.

Binding Backups

Binding is a Tivoli Storage Manager term that refers to associating a file with a management class. When a backup is performed, the backup objects (images) are

either bound to the default management class for the active policy set, or the objects are bound to the management class specified in your TSM include/exclude list.

`Include` statements are used to bind an object to a management class other than the default management class. The include statements are either placed directly in the **/usr/tivoli/tsm/client/api/bin/dsm.sys** file or into an include/exclude file referenced by the specified server stanza in the **dsm.sys** file.

`Include` statements to bind SysBack backups to a non-default management class are a little different than the usual Tivoli Storage Manager include statements. There are only 5 possible include statements that affect the binding of backups initiated by SysBack. They are:

```
INCLUDE /TSM4SBR/SB/* FullSystemBackupClass

INCLUDE /TSM4SBR/VG/* VolumeGroupBackupClass

INCLUDE /TSM4SBR/LV/* LogicalVolumeBackupClass

INCLUDE /TSM4SBR/FS/* FilesystemBackupClass

INCLUDE /TSM4SBR/FD/* FileDirectoryBackupClass
```

These include statements bind an entire backup type to a management class. For example, the Full System Backup is comprised of a table of contents image and several logical volume images that represent the data of raw logical volumes and/or logical volumes that have associated file systems. Each and every image created by a single backup operation, whether it be 5 or 20 images, will be bound to the same management class. Backup images are grouped by Tivoli Storage Manager so that all components of a single backup operation will expire at the same time based on the management class attributes.

Rebinding Backups

Rebinding is a Tivoli Storage Manager term that refers to reassigning a backup to a different management class. To understand more about how TSM binds backup versions, please refer to the Tivoli Storage Manager documentation for your server.

Tivoli Storage Manager Versioning of SysBack Backup Types

The Management Class Versioning applies individually to each SysBack backup type. Therefore a TSM Retain Version setting of 5 would allow for:
- 5 Full System Backup versions
- 5 Volume Group Backup versions
- 5 Logical Volume Backup versions
- 5 File system Backup versions
- 5 File/Directory Backup versions

This sample configuration would allow for a total of 25 SysBack backup images to exist in the Tivoli Storage Manager server.

Excluding Objects from SysBack Backups

In order to exclude specified files, directories, logical volumes, or file systems from backup processing, you must create an exclude list. The exclude list is created from within SysBack. Tivoli Storage Manager exclude statements located in a **dsm.sys** file will not be processed by SysBack backup commands. For more information regarding SysBack exclude lists, please refer to Chapter 11, "Exclude Lists," on page 145.

Restoring SysBack Backups from a Tivoli Storage Manager Server

Initiating restore operations from a Tivoli Storage Manager server is just like performing any other SysBack restore. Restore operations are initiated by the usual SysBack restore commands. However, rather than specifying a directory, tape, or CD/DVD drive as the restore device, the Tivoli Storage Manager virtual device is specified. You must also specify the unique backup id associated for the backup object that you would like to restore. When performing a restore operation from within the SMIT interface, you will be presented with a selection list that looks similar to the following:

```
Backup ID  Type  Active?  Open?   Management Class    Backup Date
---------  ----  -------  ------- ------------------  -----------------
   0.6684  FD    No       No      DEFAULT             02/18/2003 13:07:
   0.6686  FD    Yes      No      DEFAULT             02/18/2003 13:08:
   0.6679  LV    Yes      No      DEFAULT             02/18/2003 13:06:
   0.6659  SB    Yes      No      DEFAULT             02/17/2003 14:54:
   0.6673  VG    Yes      No      DEFAULT             02/17/2003 15:31:
   0.6636  FS    Yes      No      DEFAULT             02/17/2003 13:53:
```

Note: The output is displayed by descending date regardless of backup type. Within a date, the backups are grouped by type, and then by ascending time stamp for each type.

For additional information regarding SysBack restore operations, please refer to Chapter 12, "Recreating or Restoring from Backups," on page 151.

Available Options for Reinstalling the System Using SysBack and TSM

The system recovery process has two major components: the boot process and the install process. The boot process is used to bring the system into a state whereby the operating system can be installed, configured, and data restored into its structures. The install process is the component that builds the operating system and creates its disk, volume group, file system, logical volume, and other necessary structures. These structures will be collectively referred to as LVM structures. The install process also restores system and user data.

Boot Processing Options

SysBack provides the following system boot options for use with system installation via a TSM server:

- CD or DVD device
- Network

Note: Due to current architectural limitations, tape boot processing can not be supported for use with system installation via a TSM server. It is supported for all other SysBack backup types.

To learn more about creating CD/DVD boot media, please refer to the sections "Creating a Bootable CD/DVD (Without Data)" on page 277 and "Changing SysBack CD/DVD Boot Defaults" on page 286 in chapter "Utilities" on page 8.

The **Configuring Network Boot Options for Use with TSM** section of this chapter describes how to use the Network Boot option for system recovery.

Installation Processing Options

The operating system, its LVM structure information, and other user data used by the installation process can be stored in a variety of ways.

A SysBack Full System (Installation Image) backup stored in a TSM server should contain all of the necessary operating system, LVM structure, and other user data required to complete the system installation process.

TSM Backup-Archive client file by file backups may have all of the necessary operating system and user data required to complete the system installation process. However, it will not have the necessary LVM structure information that is required to hold the TSM B/A client data. TSM B/A Client file by file backups do not backup the underlying AIX file system or logical volume structure – only the data contained within them. Therefore, in order to restore that data using TSM, you must have already created the underlying structures.

Notes:

1. SysBack only supports the TSM B/A Client file by file backups. A file by file backup is defined as being a TSM incremental or selective backup. Other backups types such a image backups, backup sets, and NAS backups are not supported.

2. If you have excluded any portion of the /, /usr, or /var file systems from your backups via TSM exclude options, you will not be able to reinstall the system using TSM backup data. These items are required for AIX to operate properly.

Since the TSM B/A client backups do not contain the necessary LVM structure information required for system installation, SysBack has created an **LVM Only Backup** option. You will use this special backup type in combination with your TSM B/A client backups during the system install processing. Together, they will provide all of the structures and information necessary to reinstall the system.

Configuring Network Boot Options for Use with TSM

In order to perform a system recovery, the SysBack install client must first be booted to the **SysBack System Installation & Maintenance Main Menu**.

Note: For more information regarding the installation and maintenance menus, please refer to sections "Reinstalling the System Using SysBack Backups Stored in a TSM Server" on page 259, "Reinstalling the System Using TSM B/A Client Backups" on page 263, and Chapter 14, "System Installation and Maintenance," on page 185.

The Network boot configuration procedures are performed like any other SysBack network boot configuration. All of the same requirements apply with the following additional requirements:

- When using the SysBack Classic Network Boot option:
  - the TSM 32-bit API client and the **tivoli.tivguid** (prerequisite of the API client) file sets must be installed on to the network boot server.

- the TSM Backup-Archive Client file set, and any of its prerequisites, must be installed on to the network boot server if you will be using TSM B/A client backups to reinstall the system.

  Note: Please refer to the appropriate TSM documentation for instructions related to installing either the TSM API or TSM BA client.

- When using the SysBack NIM Resource Network Boot option:
  - the TSM 32-bit API client and **tivoli.tivguid** (prerequisite of the API client) file sets must be installed in to the NIM SPOT resource.
  - the TSM Backup-Archive Client file set, and any of its prerequisites, must be installed into the NIM SPOT resource if you will be using TSM B/A client backups to reinstall the system.

  Note: There is not a SysBack utility available for installing the TSM file sets into the NIM SPOT resource. You must install them yourself using standard NIM commands.

For detailed information related to network boot configuration, please refer to Chapter 15, "Network Boot/Installation Configuration," on page 207.

Additionally, you may choose to pre configure the **TSM Network Install Client Defaults** to avoid the manual entry certain values in the **SysBack Installation & Maintenance Main Menus**. If you choose to use this option, you must configure the **SysBack Network Boot Client** for this system before setting these install defaults.

To access the **TSM Network Install Client Defaults** Menu:
1. Log in as the root user.
2. Type smitty sysback and press Enter.
3. Select **Tivoli Storage Manager Configuration** and press Enter.

   The following screen is displayed:

Figure 141. The TSM Configuration Menu

```
                        TSM Configuration

  Move cursor to desired item and press Enter.

    TSM Virtual Device Configuration
    TSM Backup Management
    Set TSM Network Install Client Defaults




  F1=Help              F2=Refresh          F3=Cancel    F8=Image
  F9=Shell             F10=Exit            Enter=Do
```
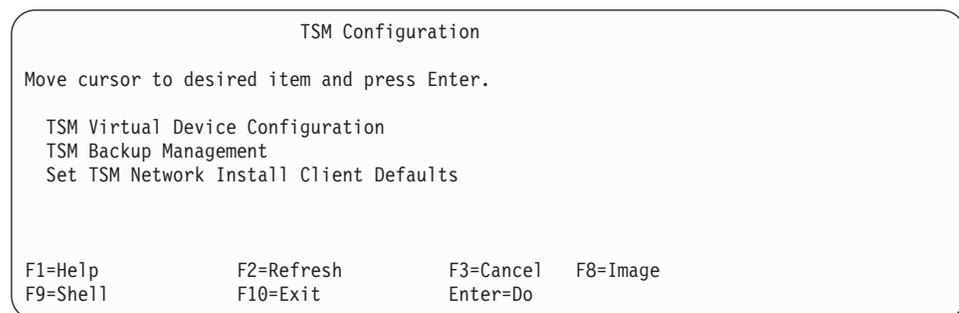
4. Select **TSM Network Install Client Defaults** and press Enter.
5. Highlight the desired network boot client when prompted in the **Select a Client Name** dialog and press Enter.

   Note: The SysBack network boot client definition is based on the hostname of the client system. This may, or may not be, the same as the Tivoli Storage Manager client node name.

   The following screen is displayed:

Figure 142. The Set TSM Network Install Client Defaults Menu

```
                  Set TSM Network Install Client Defaults

Type or select values in entry fields.
Press Enter AFTER making all desired changes.
                                             [Entry Fields]
 *Hostname                                   sysback2.aix.dfw.ibm.c>
 Perform no-prompt installation?        no
 Debug Loggin?                  yes
         THE FOLLOWING ARE REQUIRED FOR NOPROMT INSTALL:
 Console Device Name            []
  Console terminal type (is ascii)            []
 Non-rootvg volume group option              Restore All VGs
 TSM Client Node Name                        []
 TSM Admin ID                                []
 TSM Server Port                             []
 Gateway                                     []
 Client Node or Admin Password               []
 TSM Backup ID               []
 TSM Server Port             []
 TSM network device name                     [] +
 [MORE...18]
     F10=Exit            Enter=Do
```

6. 6. Enter values for all applicable fields.

The fields have the following definitions:

Hostname (Required)
Specify the hostname of the system which was configured as a SysBack network boot client. The value for this field was populated by the input in the previous menu.

> **Note:** The SysBack network boot client definition is based on the host name of the client system. This may, or may not be, the same as the Tivoli Storage Manager client node name.

Perform No-Prompt Installation?
Specifies whether or not to prompt the client. If this field is set to No, the installation menus appear after a network boot. Otherwise, the installation occurs after the network boot without prompting the user as long as all required information for the user is also provided.

Debug Logging?
The Yes option turns on debug logging operations for troubleshooting network boot and installation problems.

Console Device Name
To prevent the prompt before installation that determines the console to be used for installation, enter the name of the console here. The console can be either an LFT (graphical display) or TTY (ascii display) device. Examples are: /dev/lft0 or /dev/tty0. If an LFT device exists on the client, you can select it by typing /dev/console.

> **Note:** You must select a display, even for no-prompt installations, in order to receive error or warning messages and to enable prompts if the default information provided is insufficient.

Console Terminal Type (if ascii)
If you specified a TTY device, specify a terminal type. This ensure that

the installation menus, if required, display with the correct terminal emulation. Examples of common terminal types are: ibm3151, tvi925, and vt100.

Non-rootvg Volume Group Option
Specifies how to handle volume group processing during installation. The available options are:

restore all VGs
All volume groups included on the backup media are created and restored. Volume groups defined on the original system but whose data was not included on the backup are created but no data is restored.

import non-rootvg VGs
The rootvg volume group is created and restored and all other volume groups are imported from disks on the client. This options assumes that the non-rootvg volume groups already exist on the client. This option is typically used when restoring the rootvg volume group after a system failure where no other volume groups were affected.

restore rootvg only
Only the rootvg volume group is created and restored from the media, even if other volume groups are defined on the backup. At the end of the installation, rootvg is the only defined volume group.

TSM Client Node Name (Required)
Specify the Tivoli Storage Manager node name that will be used to connect to the Tivoli Storage Manager server for bare machine recovery.

TSM Admin ID (Optional)
Specify a TSM Admin ID that has client owner authority when the client node's password is unknown. When specifying a value in the field, you must also specify the Admin's password in the **Password** field rather than the client node password.

Client Node or Admin Password
Specify the Tivoli Storage Manager client password that is associated with the Tivoli Storage Manager client nodename option. If you do not know the password of the client node name, enter the password to administrative id created for this node which has client owner authority. In most cases, this was automatically created when you registered the node to the Tivoli Storage Manager server.

> **Note:** Note: If you do not know either password, you will have to log on to the Tivoli Storage Manager server as an administrator and issue the command: update node your_nodename new_password. Then enter that new password into this field.

TSM backup ID
Specify a TSM backup ID to be restored. The backup id is in the form of 0.9527.

TSM Server Port
Specify the Tivoli Storage Manager server port number that should be used to connect to the Tivoli Storage Manager server for bare machine recovery.

Tivoli Storage Manager Network Device Name
Specify the network device name to use for communications with the Tivoli Storage Manager server. For example: ent0.

Gateway

Specify the gateway address that this client system must go through in order to access the server system. If the client and the server are on the same subnet, it is recommended to reenter the server's IP address here.

Tivoli Storage Manager Server IP Address

Specify the IP address that corresponds to the **TCPServeraddress** for the Tivoli Storage Manager server as defined in the file **/usr/tivoli/tsmserver/bin/dsmserv.opt** on the Tivoli Storage Manager server system.

Subnet Mask

Specify the subnet mask, if required, for the client network interface to contact the installation server.

Token-ring Speed (if applicable)

Specify the correct token-ring speed when a token-ring device specified in the **Tivoli Storage Manager Network Device** field.

Ethernet Interface (if applicable)

Specify either type of Ethernet interface when an Ethernet device is specified in the **Tivoli Storage Manager Network Device Name** field. For example: IEEE 802.3

Ethernet Connection Type (if applicable)

Specify the connection type for the Ethernet interface when an Ethernet device is specified in the **Tivoli Storage Manager Network Device Name** field. For example: BNC.

Remove SysBack from foreign client after install?

Indicates whether or not to remove the SysBack program from the system after installation. Choose Y for "yes" when you have not purchased a license for the client that will be installed. The default is N or "no".

Remove Network Config from foreign client?

Indicates whether or not to remove network specific information required to configure the host to the network. This option is useful when the machine installed was cloned from a backup image of a machine that is still present on the network. The default is N or "no".

Install Additional Device Driver Support?

This option tells SysBack how much to install of what is contained in the media in the location specified by the **Software Install Device** option. The two options are:

Minimum

Selecting this option will install only those device support file sets identified by AIX when the system was booted. This information is obtained from the file /tmp/devices.pkgs which is created by AIX when the system was booted. This file is not always 100% accurate regarding what device support is needed because some devices return invalid **installp** package names rather than individual file set names. In most cases, however, this is a reliable alternative to pre-installing all device support file sets on to a system prior to creating the backup image.

All　　Selecting this option tells SysBack to perform an install command against every item contained on the media in the specified location. This may include device support file sets or any other software that is located on the media.

None Do not install any additional device driver support.

Software Install Device

This option lets you specify a CD/DVD device name, a tape device name, or a NIM LPPSOURCE directory name. The NIM LPPSOURCE directory name specified the location of additional device support to install during installation. This device support, if available in the specified location, will be installed in circumstances where the needed device support for this machine is contained in the boot image, not the backup image to be installed.

If this is a NIM Resource Network Boot, SysBack will automatically pulls device support from the NIM LPPSOURCE specified when the Network Boot client was added regardless of whether this option is edited. For additional information about configuring a NIM Resource Network Boot, please refer to Chapter 15, "Network Boot/Installation Configuration," on page 207.

Post-Install Script

The fully-qualified path and name of a post-install script to run at the end of installation. The file must exist on the installation server and be readable by any user. For more information about post-install scripts, please review Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487.

LVM Information File

The fully-qualified path and name of an LVM information file. The LVM information file must contain information that is compatible with the client. The file must exist on the installation server and be readable by any user. For more information about LVM information files, please refer to "Creating or Editing an LVM Information File" on page 293.

Note: This option is different than the **LVM Only Backup** option. The LVM Only Backup option information can not be pre configured using boot defaults.

Filename of Post First Boot Script

The file may be located and named as you choose as long as it resides in the root volume group. This script is executed after the all data is restored as a part of the first reboot process. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well. This script must be executable before writing it to this installation diskette.

Note: You may also configure this option in the **SysBack Installation and Maintenance Main Menu** by defining it in the **Post Install Configuration Options** menu named **Post Device Configuration Options**.

Recover Devices

The Recover Devices option provides 3 choices: `CLASSIC` , `Y` , and `N`. This is an advanced AIX administration concept that should only be manipulated by those familiar with the AIX ODM and the AIX RDA program. The default option is `CLASSIC`.

Classic

The `CLASSIC` option indicates that SysBack will process device

configuration during the system installation process as it has always done prior to the implementation of this option. In the `CLASSIC` scenario, SysBack will merge the ODM device entries that were created and used by the AIX RAMFS during the initial phase of the system installation process, with the ODM stored in the backup image.

Y   The `Y` option indicates that the ODM entries will be recovered only from the backup image. Using this option is sometimes useful in environments where devices have been given AIX names in an order that is different than how the operating system detects those devices on boot. A common example of this is seen in environments that have multiple port RAN devices with hundreds of TTYs attached.

N   The `N` option indicates that the ODM entries will not be recovered from the backup image. Only those devices that are detected during the system boot process will be configured. These devices will be configured with the default options. Any customized device attributes will be lost.

It is important to note that widely unpredictable results can be seen when using the `Y` and `N` options depending on your system configuration, if you are cloning, or if you are simply restoring a backup image to the same hardware. Use this option with extreme caution. If you encounter results other than you expected after specifying the `Y` and `N` options, simply perform the system installation process again and let the process default to `CLASSIC`.

TIP:

Use the `CLASSIC` option if:

- you are unfamiliar with the AIX ODM and RDA and do not have a specific need to manipulate how the operating system and SysBack detect and configure the devices
- you are cloning the backup image to a new machine that does not have exactly, 100% the same hardware configuration

Use the `Y` option if:

- you are restoring the backup image on the same machine as where the backup image was created.

Use the `N` option if:

- the state of your devices and their definitions is dramatically inconsistent. Using this option under these circumstances will cause the operating system to only configure physically detectable devices to their defaults. You may then begin redefining your other devices and device attributes from scratch.

7. 7. Press Enter to set the defaults.

Reinstalling the System Using SysBack Backups Stored in a TSM Server

Performing a system installation, or bare machine recovery, using a SysBack backup stored in a Tivoli Storage Manager server is just like any other SysBack system installation with the following exceptions:

- You must use either a network boot or a CD/DVD device boot in order to boot the system to the **Installation and Maintenance Main Menu**. Tape device boots are not supported.
- The installation device will be a Tivoli Storage Manager virtual device rather than a tape, CD, DVD, or another network install server.

Once you have successfully executed a system boot, the following menu will be
displayed:

Figure 143. SysBack Installation and Maintenance Menu

```
       +----------------------------------------------------------+
       |IBM Tivoli Storage Manager for System Backup and Recovery |
       +----------------------------------------------------------+
                   +--------------------------------+
                   |    Installation & Maintenence  |
                   |        M A I N   M E N U        |
                   +--------------------------------+

                    Change Installation Device

          LVM Only Backup Options ( for TSM BA Client Restores Only)

             Change Volume Group & Logical Volume Information

                  Install the System with Current Settings

                              Utilities Menu

                            Reboot the System

 +-----------------------------------------------------------------------
 |         Use ARROW or Tab keys to move and ENTER to Select.          |
 +-----------------------------------------------------------------------
```

Setting Installation Device Options

To verify or change the network information required to connect to a Tivoli Storage
Manager server for retrieval of the SysBack backup image, select **Change
Installation Device** option to display the following menu:

Figure 144. Change Installation Device Menu

```
       +----------------------------------------------------------+
       |                 Change Installation Device               |
       +----------------------------------------------------------+

     Device         Description                         Location
     /dev/rmt0      5.0 GB 8mm Tape Drive               04-C0-00-5,0
     /dev/tok0      IBM PCI Tokenring Adapter (14101800 04-05
     /dev/ent0      IBM PCI Ethernet Adapter (22100020) 04-B0
     /dev/ent1      IBM 10/100 Mbps Ethernet PCI Adapte 04-04
 ==> tsmdev         TSM Virtual Device (tok0)           04-05



 +-----------------------------------------------------------------------
 |        Select one network device or one or more devices.           |
 |           The "==>" symbol indicates current choice(s).             |
 +-----------------------------------------------------------------------
 |Use ARROW or Tab keys to move, ENTER to select or deselect, ESC when done|
 +-----------------------------------------------------------------------
```

Select the `tsmdev` device to verify or change the network interface associated with
this restore process. The following menu will be displayed:

Figure 145. The Change Network Interface Menu

```
    +----------------------------------------------------------+
    |                 Change Network Interface                 |
    +----------------------------------------------------------+

     Device        Description                    Location
   ==>/dev/tok0    IBM PCI Tokenring Adapter (14101800  04-05
     /dev/ent0     IBM PCI Ethernet Adapter (22100020)  04-B0
     /dev/ent1     IBM 10/100 Mbps Ethernet PCI Adapte  04-04



+------------------------------------------------------------------------+
|          Select one network device or one or more devices.             |
|             The "==>" symbol indicates current choice(s).              |
+------------------------------------------------------------------------+
|Use ARROW or Tab keys to move, ENTER to select or deselect, ESC when done|
+------------------------------------------------------------------------+
```

Select the desired network interface and press Enter to verify or change the
network settings associated with this restore process. The following screen will be
displayed:

Figure 146. The Change TSM Network Settings Menu

```
    +----------------------------------------------------------+
    |                 Change TSM Network Settings              |
    +----------------------------------------------------------+
          Client IP Address         192.168.1.58
          Client Node Name          lasher
          TSM Admin ID
          Server IP Address         192.168.1.55
          Gateway IP Address        192.168.1.58
          Subnet Mask               255.255.255.192
          Port Number               1500
          Password:                 tsmpass
          Token-ring Speed:
                   4  megabits
               ==> 16 megabits
Network Adapter: tok0  [inactive]
+------------------------------------------------------------------------+
| Enter the TSM server port number that corresponds to the desired TSM   |
| server connection for this installation.                               |
+------------------------------------------------------------------------+
| Use ARROWS or Tab to move or INS/DEL to edit. Press ESC to return.     |
+------------------------------------------------------------------------+
```

Verify or edit the values in each field as required for this restore process. The fields
have the following definitions:

Client IP Address (Required)
> Specify the IP address of this client system. Do not enter leading zeros in
> the address.

Client Node Name (Required)
> Specify the Tivoli Storage Manager client nodename that was used to create
> the backup object that you would like to restore. This may, or may not be,
> the same name as the hostname returned by the **Client IP Address**
> specified above.

TSM Admin ID (Optional)
Specify a TSM Admin ID that has client owner authority when the client node's password is unknown. When specifying a value in the field, you must also specify the Admin's password in the Password field rather than the client node password.

Server IP Address (Required)
Specify the IP address of the server system that will be used to reinstall this client. This should be the system running the Tivoli Storage Manager server that has the desired backup object to restore. If the boot server is the same as the installation server, do not change this value unless you have chosen a different network interface to perform the installation. If you are choosing a different network interface to perform the install, or the installation server is different that the boot server, enter the correct address. Do not enter leading zeros in the address.

Gateway IP Address (Optional)
Specify the gateway address that this client system must go through in order to access the server system. If the client and the server are on the same subnet, it is recommended to reenter the server's IP address here.

Subnet Mask (Optional)
Specify the subnet mask, if required, for the client network interface to contact the installation server.

Port Number (Required)
Specify the port number that accepts client connections as defined on the Tivoli Storage Manager server. If you do not know the port number defined for the Tivoli Storage Manager server, you must check the **/usr/tivoli/tsm/server/bin/dsmserv.opt** file located on the Tivoli Storage Manager server system.

Password (Required)
Specify the Tivoli Storage Manager client password that is associated with the **Client Node Name** value. If you do not know the password of the client node name, enter the password to administrative id created for this node which has client owner authority. In most cases, this was automatically created when you registered the node to the Tivoli Storage Manager server.

Note: If you do not know either password, you will have to log on to the Tivoli Storage Manager server as an administrator and issue the command: update node your_nodename new_password. Then enter that new password into this field.

Token-ring Speed
Specify the correct token-ring speed when a token-ring device specified as the network adapter.

Ethernet Interface (if applicable)
Specify either type of Ethernet interface when an Ethernet device is specified as the network adapter. For example: IEEE 802.3

Ethernet Connection Type (if applicable)
Specify the connection type for the Ethernet interface when an Ethernet adapter is specified. For example: BNC.

Selecting the Backup Object to Restore

Once you have configured the installation device settings as desired, you will need to query the Tivoli Storage Manager server and select the backup object to restore. The easiest way to achieve this is to access the **Change Volume Group & Logical Volume Information** menu. Selecting this menu after setting your `tsmdev` installation device settings will cause SysBack to query the correct Tivoli Storage Manager server to obtain a list of backup objects available for restore.

Figure 147. The Backup Image to Restore Selection Menu

```
      +--------------------------------------------------------+
      |   Tivoli Storage Manage for System Backup and Recovery  |
      +--------------------------------------------------------+

      Backup ID      Ative      Management Class      Backup Date
 ==> 0.1345         Yes        SystemBackupClass     01/19/03 11:56:00
     0.1214         No         SystemBackupClass     01/18/03 13:10:05
     0.1010         No         OldBackupClass        01/15/03 09:54:25
+---------------------------------------------------------------------+
|         Select the backup ID to use from the above list            |
|              The "==>" symbol indicates current choice(s).          |
+---------------------------------------------------------------------+
|Use ARROW or Tab keys to move,ENTER to select or deselect, ESC when done|
+---------------------------------------------------------------------+
```

Once you have selected the backup object to restore, you are ready to customize any other installation attributes as desired. If you do not need to make any changes, simply begin the install. To learn more about how to customize your LVM attributes, please refer to Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

Reinstalling the System Using TSM B/A Client Backups

Performing a system installation, or bare machine recovery, using TSM B/A client backups is very similar to the process of reinstalling the system using SysBack Backups stored in a TSM server. Please take note of the following:

- You must use either a network boot or a CD/DVD device boot in order to boot the system to the **Installation and Maintenance Main Menu**. Tape device boots are not supported.
- The installation device will be a Tivoli Storage Manager virtual device rather than a tape, CD, DVD, or another network install server.
- You will be required to specify the location of an **LVM Only Backup** image to be used in combination with the TSM B/A client backups.

Once you have successfully executed a system boot, the following menu will be displayed:

Figure 148. The SysBack Installation and Maintenance Menu

```
        +---------------------------------------------------------+
        |IBM Tivoli Storage Manager for System Backup and Recovery |
        +---------------------------------------------------------+
                 +-------------------------------+
                 |     Installation & Maintenence |
                 |        M A I N   M E N U       |
                 +-------------------------------+

                      Change Installation Device

          LVM Only Backup Options ( for TSM BA Client Restores Only)

             Change Volume Group & Logical Volume Information

                Install the System with Current Settings

                            Utilities Menu

                          Reboot the System

 +----------------------------------------------------------------------
 |         Use ARROW or Tab keys to move and ENTER to Select.         |
 +----------------------------------------------------------------------
```

Setting Installation Device Options

To verify or change the network information required to connect to a Tivoli Storage
Manager server for retrieval of TSM B/A client backups, select **Change Installation
Device** to display the following menu:

Figure 149. The Change Installation Device Menu

```
        +---------------------------------------------------------+
        |               Change Installation Device                |
        +---------------------------------------------------------+

     Device          Description                         Location
     /dev/rmt0       5.0 GB 8mm Tape Drive               04-C0-00-5,0
     /dev/tok0       IBM PCI Tokenring Adapter (14101800  04-05
     /dev/ent0       IBM PCI Ethernet Adapter (22100020)  04-B0
     /dev/ent1       IBM 10/100 Mbps Ethernet PCI Adapte  04-04
     tsmdev          TSM Virtual Device (tok0)            04-05
 ==> tsmbadev        TSM Backup Client Device


 +----------------------------------------------------------------------
 |       Select one network device or one or more tape devices.       |
 |           The "==>" symbol indicates current choice(s).            |
 +----------------------------------------------------------------------
 |Use ARROW or Tab keys to move,ENTER to select or deselect, ESC when done.|
 +----------------------------------------------------------------------
```

Select the tsmbadev device to verify or change the network interface associated
with this restore process. The following menu will be displayed:

Figure 150. The Change Network Interface Menu

```
+------------------------------------------------------------+
|                  Change Network Interface                  |
+------------------------------------------------------------+

    Device          Description                     Location
 ==>/dev/tok0       IBM PCI Tokenring Adapter (14101800  04-05
    /dev/ent0       IBM PCI Ethernet Adapter (22100020)  04-B0
    /dev/ent1       IBM 10/100 Mbps Ethernet PCI Adapte  04-04



+-----------------------------------------------------------------------
|          Select one network device or one or more devices.           |
|             The "==>" symbol indicates current choice(s).            |
+-----------------------------------------------------------------------
|Use ARROW or Tab keys to move, ENTER to select or deselect, ESC when done|
+-----------------------------------------------------------------------
```

Select the desired network interface and press Enter to verify or change the
network settings associated with this restore process. The following screen will be
displayed:

Figure 151. The Change TSM Network Settings Menu

```
              +------------------------------------------------------------+
              |                Change TSM Network Settings                 |
              +------------------------------------------------------------+
                    Client IP Address        192.168.1.58
                    Client Node Name         lasher
                    TSM Admin ID
                    Server IP Address        192.168.1.55
                    Gateway IP Address       192.168.1.58
                    Subnet Mask              255.255.255.192
                    Port Number              1500
                    Password:                tsmpass
                    Token-ring Speed:
                            4  megabits
                        ==> 16 megabits
Network Adapter: tok0  [inactive]
+-----------------------------------------------------------------------
| Enter the TSM server port number that corresponds to the desired TSM  |
| server connection for this installation.                              |
+-----------------------------------------------------------------------
| Use ARROWS or Tab to move or INS/DEL to edit. Press ESC to return.    |
+-----------------------------------------------------------------------
```

Verify or edit the values in each field as required for this restore process. The fields
have the following definitions:

Client IP Address (Required)
> Specify the IP address of this client system. Do not enter leading zeros in
> the address.

Client Node Name (Required)
> Specify the Tivoli Storage Manager client nodename that was used to create
> the backup object that you would like to restore. This may, or may not be,
> the same name as the hostname returned by the **Client IP Address**
> specified above.

TSM Admin ID (Optional)
> Specify a TSM Admin ID that has client owner authority when the client

node's password is unknown. When specifying a value in the field, you must also specify the Admin's password in the Password field rather than the client node password.

Server IP Address (Required)
Specify the IP address of the server system that will be used to reinstall this client. This should be the system running the Tivoli Storage Manager server that has the desired backup object to restore. If the boot server is the same as the installation server, do not change this value unless you have chosen a different network interface to perform the installation. If you are choosing a different network interface to perform the install, or the installation server is different that the boot server, enter the correct address. Do not enter leading zeros in the address.

Gateway IP Address (Optional)
Specify the gateway address that this client system must go through in order to access the server system. If the client and the server are on the same subnet, it is recommended to reenter the server's IP address here.

Subnet Mask (Optional)
Specify the subnet mask, if required, for the client network interface to contact the installation server.

Port Number (Required)
Specify the port number that accepts client connections as defined on the Tivoli Storage Manager server. If you do not know the port number defined for the Tivoli Storage Manager server, you must check the **/usr/tivoli/tsm/server/bin/dsmserv.opt** file located on the Tivoli Storage Manager server system.

Password (Required)
Specify the Tivoli Storage Manager client password that is associated with the **Client Node Name** value. If you do not know the password of the client node name, enter the password to administrative id created for this node which has client owner authority. In most cases, this was automatically created when you registered the node to the Tivoli Storage Manager server.

> **Note:** If you do not know either password, you will have to log on to the Tivoli Storage Manager server as an administrator and issue the command: `update node your_nodename new_password`. Then enter that new password into this field.

Token-ring Speed
Specify the correct token-ring speed when a token-ring device specified as the network adapter.

Ethernet Interface (if applicable)
Specify either type of Ethernet interface when an Ethernet device is specified as the network adapter. For example: `IEEE 802.3`

Ethernet Connection Type (if applicable)
Specify the connection type for the Ethernet interface when an Ethernet adapter is specified. For example: `BNC`.

Specifying the LVM Only Backup Location

Once you have verified your **Installation Device** attributes, you must specify the location of your LVM Only Backup.

Use the ESC key to return to the **SysBack Installation & Maintenance Main Menu**. From this menu, select the **LVM Only Backup Options (for TSM BA Client Restores Only)** option. A menu similar to the following will display:

Figure 152. Change LVM Installation Device Menu

```
     +---------------------------------------------------------+
     |              Change LVM Installation Device             |
     +---------------------------------------------------------+

     Device        Description                      Location
     /dev/rmt0     5.0 GB 8mm Tape Drive            04-C0-00-5,0
     /dev/tok0     IBM PCI Tokenring Adapter (14101800  04-05
     /dev/ent0     IBM PCI Ethernet Adapter (22100020)  04-B0
     /dev/ent1     IBM 10/100 Mbps Ethernet PCI Adapte  04-04
     tsmdev        TSM Virtual Device (tok0)        04-05

 +-----------------------------------------------------------------------+
 |        Select one network device or one or more tape devices.         |
 |           The "==>" symbol indicates current choice(s).               |
 +-----------------------------------------------------------------------+
 |Use ARROW or Tab keys to move, ENTER to select or deselect, ESC when done.
 +-----------------------------------------------------------------------+
```

Select the device definition that represents the location of the **LVM Only Backup**. The three device type options available are:

A local tape, CD, or DVD Device

> When a locally attached tape, CD, or DVD device name is selected, the LVM Only Backup will be read from that device.

A remote tape, CD, or DVD Device (via a local network device)

> In order to access a list of available devices located on a remote system, you must first configure a locally attached network device. To do this, select the device name of the locally attached network device to use. Once selected, you will be prompted to configure the network settings for that adapter via the **Change Network Setting Menu**.

> After configuring the network settings for this adapter, you will be presented with a list of devices located on the remote system. Select the device name that contains the LVM Only Backup media.

A TSM virtual device

> When the `tsmdev` device is selected, the **LVM Only Backup** will be read from the same TSM server that was defined for TSM B/A client backup installation device. i.e. `tsmbadev`

> If the TSM `nodename` used for the SysBack LVM Only Backup is different than the `nodename` used for the TSM B/A Client backups, select the `tsmdev` option to modify the node information.

> The connection information is supplied via the **Change Installation Device** menu and the associated `tsmbadev` device submenu will be presented. You may then modify the following fields as appropriate:

> - Client Node Name
> - TSM Admin Name
> - Node/Admin Password

Defining the TSM BA Client Restore Information

Once you have configured the installation device settings, you will need to define the options associated with the TSM B/A Client restore operations. Use the ESC key to return to the **SysBack Installation & Maintenance Main Menu**. From this menu, select the **Utilities** option. A menu similar to the following will display:

Figure 153. The Utilities Menu

```
       +---------------------------------------------------------+
       |                     Utilities Menu                      |
       +---------------------------------------------------------+

                     Start a Maintenance Shell

                   Import the rootvg Volume Group

                   Perform Recovery Installation

                         Backup Options

               Post Install Configuration Options

                      Copy a System Dump

                     Set Firewall Options

                        Debug Options
```
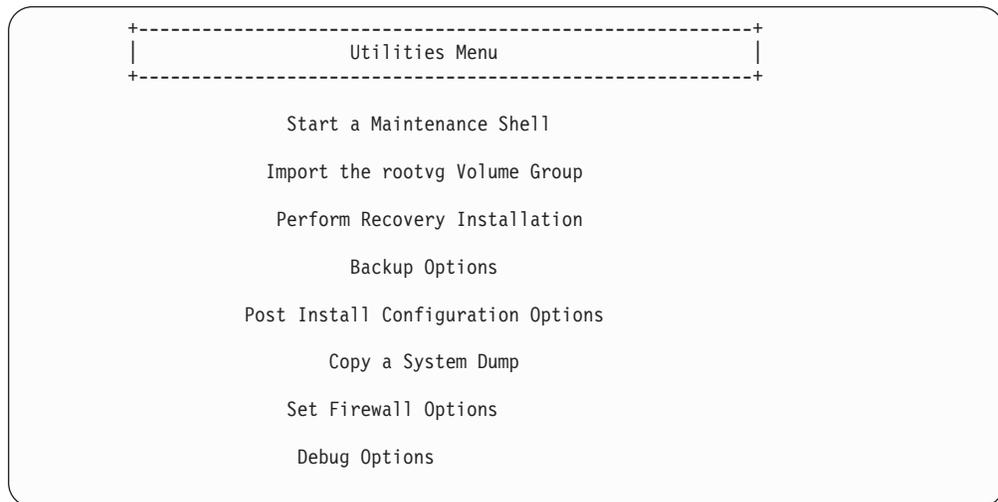
Select the **Backup Options** menu to display the following:

Figure 154. Backup Options Menu

```
       +---------------------------------------------------------+
       |                    Backup Options                       |
       +---------------------------------------------------------+

              Set Tape Backup Sequence Number for Install

                  TSM BA Client Restore Options
```
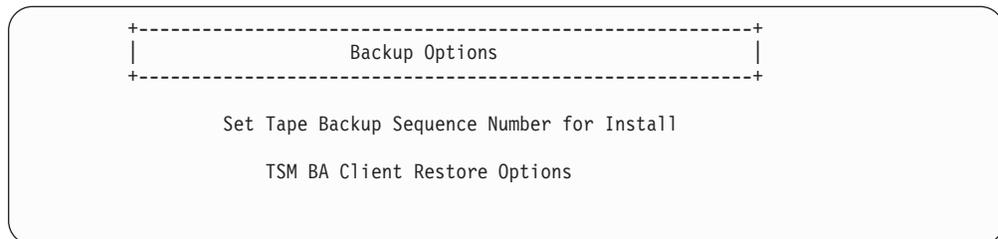
Select the **TSM B/A Client Restore Options** menu to display the following options:

Figure 155. The TSM BA Client Restore Options Menu

```
+-----------------------------------------------------------+
|                  TSM BA Client Restore Options            |
+-----------------------------------------------------------+
        Latest                    yes
        Point in Time (date)      []
        Point in Time (time)       []
        Make Sparse               no
        Tape Prompt               no
        Verbose                   no
```

The fields have the following definitions:

Latest (Optional)
Use the latest option to restore the most recent backup version of a file, even if the backup is inactive. If you are performing a point-in-time restore (using the `pitdate` option), it is not necessary to specify latest since this option is implicit when the `pitdate` option is used.

Point in Time (date)
Use the Point in Time (date) option with the Point in Time (time) option to establish a point-in-time for which you want to restore the latest version of your backups. Files or images that were backed up on or before the date and time you specified, and which were not deleted before the date and time you specified, are processed. Backup versions that you create after this date and time are ignored. When the point-in-time option is used, the inactive and latest options are implicit.

Point in Time (time)
Use the Point in Time (time) option with the Point in Time (date) option to establish a point-in-time for which you want to restore the latest version of your backups. Files or images that were backed up on or before the date and time you specified, and which were not deleted before the date and time you specified, are processed. Backup versions that you create after this date and time are ignored. When the point-in-time option is used, the inactive and latest options are implicit.

Make Sparse

Use the Make Sparse option to specify how sparse files are recreated. Sparse files do not have disk space allocated for every block in the address space leading to empty spaces within the file. These empty spaces of unallocated disk space within the file are denoted by zero values, or null values. The Tivoli Storage Manager client detects sparse files during a backup operation and marks them as sparse on the Tivoli Storage Manager server.

If you set the Make Sparse option to yes (default), the "holes" within the file are preserved and disk blocks will not be allocated for those portions of the address space.

If you set the Make Sparse option to no, disk blocks will be allocated for the entire address space. This might result in a larger amount of disk space usage than before the file was backed up. You must ensure that you have enough disk space to restore all data when setting this option

Tape Prompt
The Tape Prompt option specifies whether you want Tivoli Storage Manager to wait for a tape mount if it is required, or to be prompted for a choice.

Verbose

The verbose option specifies whether you want to display detailed processing information on your screen.

The `subdir=yes` and `preserverpath=no` TSM restore options are automatically enabled by the SysBack installation processing.

To learn more about any of these TSM restore options, please refer to the Tivoli Storage Manager UNIX and Linux Backup-Archive Clients: Installation and User's Guide.

Starting the Installation Process

Once you have defined the TSM B/A client restore options, you are ready to customize any other installation attributes as desired.

Note: To learn more about how to customize your LVM attributes, please refer to Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

If you do not need to make any changes to the LVM attributes, use the ESC key to return to the **SysBack Installation & Maintenance Main Menu**. Then select the **Install the System** option.

Problem Determination

Understanding basic SysBack and Tivoli Storage Manager problem determination tools may help you resolve minor problems without the need to contact support. In those situations where you would like to contact support for assistance, understanding the tools that support may ask you to use may be helpful as well.

There are 3 primary items that you should monitor or review periodically to ensure that all of your backup processes are functioning properly. They are:
- The SysBack command output
- The SysBack Activity Log
- The SysBack error log for the Tivoli Storage Manager API

The SysBack Command Output

The most effective way to ensure that your backup operations are completing without error is to save the output from the backup operation. Sometimes, a backup completes with a status of success but also had warning messages. In order to determine what exactly caused the warning, you will need to look at the output from the command. There have been scenarios where an overall backup process completed successfully, but due to an unforeseen operating system issue, much of the data was not actually backed up.

In order to capture the output of the SysBack backup operations, you could either use SysBack's Automatic Logging option or redirect standard output and standard error to a file.

Note: For more information regarding the SysBack's Automatic Logging option, please refer to "Automatic Backup and Restore Process Logging" on page 321.

To redirect standard output and standard error to a file you could issue your command in a manner like this:

```
/usr/sbin/sysback -f tsm0 datavg > /tmp/backup.log 2>&1
```

If you would like to monitor the backup process on your screen and save the output to a file at the same time, you could issue a command like this:

```
/usr/sbin/sysback -f tsm0 datavg 2>&1 | tee /tmp/backup.log
```

There are several different methods for capturing the standard output (STDOUT) and standard error (STDERR) from a command. There are also several ways to rotate your backup logs or to dynamically created the log name. Simply choose the method that is appropriate to your environment.

The SysBack Activity Log

SysBack provides a basic Activity Log that indicates the start date and time of all backup, restore and verify operations. It also includes the command issued, and if the command was successful, failed, and/or had warnings.

Note: For more information regarding the SysBack Activity Log, please refer to "Activity Logging" on page 326.

SysBack Error Log for the Tivoli Storage Manager API

The Tivoli Storage Manager API error log specific to the SysBack initiated communications is located at **/usr/lpp/sysback/sbtsmerror.log**. You should periodically review this file for issues related to Tivoli Storage Manager server communications.

Note: You can override this location by setting the DSMI_LOG environment variable in your **.profile** or **.kshrc** file.

Debug Options

Occasionally, more detailed information is needed for diagnosis, these 4 primary options are available:
- Putting the SysBack programs into debug
- Putting SysBack Tivoli Storage Manager API programs into debug
- Tracing the Tivoli Storage Manager API programs
- Putting the installation process into debug

Please contact your support representative to obtain detailed information before using any of these debug options.

Additional Information Resources

For more information related to network boot, please refer to Chapter 15, "Network Boot/Installation Configuration," on page 207.

For more information related to the system installation process using SysBack, please refer to Chapter 14, "System Installation and Maintenance," on page 185.

For more information related to customizing your LVM attributes, please refer to Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

For examples of how to physically boot your pSeries or iSeries systems, please refer to the hardware reference manual for your particular system.

For examples related to reinstalling LPAR Capable systems, please refer to the IBM Redbook The Complete Partioning Guide for IBM eServer pSeries Servers, SG24-7039-00 (SG24-7039) located at http://www.redbooks.ibm.com/pubs/pdfs/redbooks/sg247039.pdf

Chapter 18. Utilities

The **Utilities Menu** contains options for performing special tasks, usually those used by advanced users or that are performed only periodically.

To access the **Utilities Menu**:

1. At a command line, type `smitty`.
2. From the SMIT menu, select **IBM Tivoli Storage Manager for System Backup and Recovery**.
3. Select **Utilities**.

The **Utilities Menu** is shown below. These options change more frequently than other SysBack options, because new utilities are introduced into SysBack more often than other functions. Also, items are removed as they become obsolete or are integrated with other features of the system.

The options available on the **Utilities Menu** are described in the following

```
                          Utilities

Move cursor to desired item and press Enter.

  Display SysBack Product Install History
  Print or Display System Configuration
  Create a Bootable Tape (without data)
  Create a Bootable CD/DVD (without data)
  Change SysBack Tape Boot Default
  Change SysBack CD/DVD Boot Defaults
  Change Read Permission on a Disk Image File
  Create or Edit an LVM Information File
  Create a Custom Installation Diskette
  Change SysBack Program Defaults
  Logging Options
  Collect SysBack and System Infomration




  F1=Help           F2=Refresh         F3=Cancel          F8=Image
  F9=Shell          F10=Exit           Enter=Do
```

Figure 156. The Utilities Menu

sections.

Displaying SysBack Product Installation History

You might want to know the installation history of SysBack, particularly when deciding if product updates are required. Using the **Display SysBack Product Install History** option, you can create a list containing the dates and levels of the initial SysBack installation and any product updates installed to date. The list contains the main SysBack product, as well as, any additional product features that are installed separately.

To display the product history, select **Display SysBack Product Install History** from the **Utilities Menu**. You can also create this list using the fastpath `smitty sb_showlevel` at the command line.

Printing or Displaying System Configuration

Use the **Print or Display System Configuration** option to document the system configuration, including all information pertaining to the volume groups, physical volumes, logical volumes, and file systems. It provides a report that contains all of the key information that you might need in case of various system failures.

In most cases, you do not need this information when recovering from system failures, because the SysBack installation process and the **remakevg** command recreates volume groups, logical volumes, and file systems without requiring the user to have knowledge of the system configuration. This information, however, might be useful in planning a migration of file systems to new hardware or in reorganizing an existing system to take advantage of disk striping, mirroring, or other features.

To print or display the system configuration:

1. Select **Print or Display System Configuration** from the **Utilities Menu**.
2. The following options are displayed:

   Enter print queue name ([]=display)
   > The default value is the current default printer as defined by either the PRINTER environment variable or the first print queue in the **/etc/qconfig** file. Enter the name of the print queue to use to send the report or leave the field blank to display the output on the screen.

   Enter filename to save ([]=display)
   > Default=blank. Enter the full path name of the file where you want to save the report or leave the field blank to display the output on the screen.

   Note: Both of the above fields must be blank to show the report on the screen.
3. Press Enter to print the report.

The report output includes the following information:

Volume group information
> One record for each volume group. Contains all volume group attributes and physical volume sizes. Example:

```
Volume Group  Auto-on?  PP Size  Quorum?  Total     Used      Free    PV(s)
----------    --------  -------  -------  --------  --------  ------  ------
rootvg        y         4 MB     y        250 PPs   213 PPs   37 PPs  hdisk0
                                          1002 MB   852 MB    148 MB
```

Logical Volume Information
> One record for each logical volume. Contains most logical volume attributes and a list of the physical volumes where each logical volume resides. Example:

```
Volume Group   Logical Volume   Attributes
-------------- ---------------- -----------------------------------------
rootvg         hd8              Type:   jfslog   Copies: 1    Upper: 32
                                LPs:    1        IntraPV: c   StrpSz: 0
                                MinLps: 0        InterPV: m
                                PV(s):  hdisk0
```

Physical Volume Information
> One record for each physical volume. Contains the physical volume location, size and a map of the regions on the disk where each logical volume resides.

For example:

```
PV Name  Volume Group   Location      PVID               MB    PPs
-------- -------------  ------------  ----------------  -----  ------
hdisk0   rootvg         00-00-0S-0,0 00000218acd0f607  1002   250
              LV Name             PPs      Region
              ---------------   -------    -----------
              hd8                 101      |....X.....|
              hd6               51-62      |..X.......|
                                73-96      |..XX......|
              hd4                   3      |X.........|
                              102-103      |....X.....|
              hd3             105-109      |....X.....|
              hd2                5-27      |XX........|
                              110-207      |....XXXXX.|
                              222-242      |.........X|
```

Filesystem information

One record for each file system. Contains all file system attributes.

```
Volume Group   Mount Point       FragSz  NBPI  Cmprs  BF Spt?  AG Size?
-------------- ----------------  ------  ----  -----  -------  --------
rootvg         /                   4096  2048  no     n        8
               /home                512  4096  no     y        8
               /tmp                4096  4096  no     n        8
               /usr                4096  4096  no     n        8
               /var                 512  4096  no     n        8
               /data/files          512  4096  no     y        32
```

Logical Volume Partition Maps

The specific physical partitions on the physical volumes that are used by
each logical volume. This determines the fragmentation of logical volumes.
Example:

```
Volume Group   Logical Volume  Copy#  PV Name    PP#s      PV Region
-------------- --------------  -----  ---------  -------   ------------
rootvg         hd8                1   hdisk0     101-101   |....X.....|
               hd6                1   hdisk0      51-62    |..X.......|
                                  1   hdisk0      73-96    |..XX......|
               hd4                1   hdisk0         3     |X.........|
                                  1   hdisk0     102-103   |....X.....|
               hd3                1   hdisk0     105-109   |....X.....|
               hd2                1   hdisk0       5-27    |XX........|
                                  1   hdisk0     110-207   |....XXXXX.|
                                  1   hdisk0     222-242   |.........X|
```

Creating a Bootable Tape (Without Data)

Use the **Create a Bootable Tape (without data)** option to create a bootable tape on
the local system or a remote server. This bootable tape is identical to a system
backup except that it does not contain any backup data.

The primary intention of this option is to enable you to create a tape that can be
used to boot a system to the **SysBack Installation and Maintenance Main Menu**
without having to perform a full backup. This tape enables the user to perform
system maintenance or to boot from alternate media if the boot images on a prior
system backup tape are corrupt or do not contain updated device information.

You can also boot from a tape that contains the required device support software
to perform a network installation from media on a remote server. In this case, you
must explicitly indicate that the network support be included on the tape. When
booting from tape to perform a network installation, the server on which the

installation media is present does not need the device support installed to support the client, but the installation media itself must contain the required device support.

Cloning systems: A boot tape created on one machine can be used on another machine with a different processor or platform type. The system backup created on one machine can also be installed on another machine, even if the device configuration differs. When cloning systems, the machine on which the boot tape is created must have installed all of the device and system support software for the destination platform type, processor type, and other required devices.

To create a bootable tape:

1. From the **Utilities Menu**, select **Create a Bootable Tape (without data)**.

   Note: From the command line, type smitty sb_mkboottape.

2. On the Device Selector screen, highlight the device you want to use and press Enter.

3. The following screen is displayed:

```
                 Create a Bootable Tape (without data)


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                            [Entry Fields]
  Device name                               [/dev/rmt0]
  Hostname of server
  Platform/kernel type for tape boot image  [chrp
  Network install support to include        [ent]




F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 157. The Create a Bootable Tape (without data) Menu

The fields have the following meanings:

Hostname of server
> The server hostname if a server option was selected on the prior device selector screen. You cannot change this field.

Device name
> The device, if a tape drive or virtual device was selected. You cannot change this field from this screen.

Platform/kernel type for tape boot image
> Default=current platform/kernel type. This field is displayed only when you use a tape drive or virtual device. Change this field only if you are creating a backup that is to be installed (cloned) onto another platform type or to a machine running a different kernel. Press F4 to list the platforms and kernels options for which tape boot support is installed on this system and select from the list.

> The following platform/kernel types are currently supported:

> **chrp**   Common Hardware Reference

chrp/MP	Multiprocessor Common Hardware Reference Platform
rs6k	RISC System/6000 (uniprocessor)
rs6k/MP	Multiprocessor RISC System/6000
rspc	PCI-based (PC) RISC System/6000 (uniprocessor)
rspc/MP	Multiprocessor PCI-based (PC) RISC System/6000

Network install support to include

Default=(Blank/None). If, after booting a system from this backup tape, you want to perform a network installation (rather than installation from this backup), press F4 to display a list of supported network types and select a network type from the list. You must select the network type of the adapter that will be used to install the system from the network server.

4. Press Enter to begin creation of the bootable tape.

Creating a Bootable CD/DVD (Without Data)

Use the **Create a Bootable CD/DVD (without data)** option to create a bootable CD or DVD on the local system or a remote server. This bootable media is identical to a system backup except that it does not contain any backup data.

The primary intention of this option is to enable you to create a CD or DVD that can be used to boot a system to the **SysBack Installation and Maintenance Main Menu** without having to perform a full backup. This CD or DVD enables the user to perform system maintenance or to boot from alternate media if the boot images on a prior system backup tape are corrupt or do not contain updated device information.

You can also boot from a CD or DVD that contains the required device support software to perform a network installation from media on a remote server. When booting from CD or DVD to perform a network installation, the server on which the installation media is present does not need the device support installed to support the client, but the installation media itself must contain the required device support.

Cloning systems: A boot CD or DVD created on one machine can be used on another machine with a different processor or platform type. The system backup created on one machine can also be installed on another machine, even if the device configuration differs. When cloning systems, the machine on which the boot media is created must have installed all of the device and system support software for the destination platform type, processor type, and other required devices.

To create a bootable CD or DVD:

1. From the **Utilities Menu**, select **Create a Bootable CD/DVD (without data)**.

   Note: From the command line, type `smitty sb_mkbootcd`.

2. On the Device Selector screen, highlight the device you want to use and press Enter.

   The following screen is displayed:

```
                  Create a Bootable CD/DVD (without data)


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  Device name                                 [/dev/cd0]
  Media Type?                                 DVD
  Media Size                                  []
  Platform type(s) for CD/DVD boot image      [chrp]
  Create the CD/DVD Now?                       yes
  Debug Output?                                no
  HOST OPTIONS:
  Build Temp Work Space(s) on                  N/A
  Hostname of CD/DVD Server                   []
  SOFTWARE OPTIONS:
  Location of Software Packages to copy to CD/DVD.  []
  File with list of packages to copy to CD/DVD      []
  WORK SPACE OPTIONS:
  File system to store CD/DVD file structure   []
  File system to store final CD/DVD image      []
  Local Volume Group for creation of filesystems   []
  Remote Volume Group for creation of filesystems  []
  Do not remove the final CD images           []
F1=Help            F2=Refresh        F3=Cancel          F4=List
F5=Reset           F6=Command        F7=Edit            F8=Image
F9=Shell           F10=Exit          Enter=Do
```

Figure 158. The Create a Bootable CD/DVD (without data) Menu

The fields have the following meanings:

Estimate Space Needed

Estimates the space needed only. This is like the "Preview Only" option with the AIX "installp" command.

Device Name (Required)

Specifies the CD/DVD device in the form of /dev/cd0.

Media Type?

Specifies the device/media type. Valid options are CD and DVD.

Media Size

Specifies the media size in MB to override default values. Default CD size is 650MB. Default DVD size is 4188 MB (4.09 GB). If the side of your media is double sided, only specify the size of one size of the media, not the total aggregate.

Platform type(s) for CD/DVD boot image

Specifies the platform type of the system where the CD/DVD will be utilized. Select one or more options. If you are creating the CD/DVD on the system where it will be used to boot and install, it is not necessary to change this option as the process will default to the current platform type. For example: If you were creating this CD/DVD on an "F50" system, it would be created to support the CHRP platform. If you are creating the CD/DVD to support this system and a second type of system, such as the default CHRP and also for an RSPC system, you would specify chrp rspc.

Note: The list of platform types must be space separated.
This option requires that all of the device and kernel support required to boot both platforms be installed onto the system creating the CD/DVD. Failure to have all of the needed support installed will not cause the backup and CD/DVD creation to fail. Instead, it will cause

the boot to fail when booting from a platform different than where the CD/DVD was created. Optionally using the **Location of Software Packages to copy to CD/DVD** field along with this option will allow you to place device support for both platforms into the CD/DVD boot image and also allows it to be utilized as **Post Install Device Support** media. This would be useful when you want to boot from this CD/DVD which has all needed device support, but install from a backup (tape, CD, DVD, file) that does not have all of the needed support in the backup image. Entering **ALL** in this field creates a CD/DVD that may be used to boot any system that can support the software levels in the source media. This also requires the use of the **Location of Software Packages to copy to CD/DVD** which specifies to install all device support to be built into the boot images. You will also be able to utilize this media as **Post Install Device Support**.

> **Note:** Specifying this option will perform an `installp` command against the **Location of Software Packages to copy to CD/DVD** device or directory and will install those file sets onto this system. Additionally, this support is placed onto to the CD/DVD for use as **Post Install Device Support** media.

TSM Option
> Use this option to indicate which TSM client binaries to include in this backup. The default is "none". The other options available are:

Include TSM API Code
> This option allows you to store the contents of the `/usr/tivoli/tsm/client/api` directory. These binaries are required when using the backup as the boot media for a system installation process that will use SysBack backups stored in a TSM server.

Include TSM BA Code
> This option allows you to store the contents of the `/usr/tivoli/tsm/client/ba` directory. These binaries are required when using the backup as the boot media for a system installation process that will use backups created by the TSM Backup/Archive client.

Include Both TSM API & TSM BA Code
> This option allows you to store the binaries of the TSM API client and the TSM BA client.

Create the CD/DVD Now?
> Stops the **/usr/sbin/mksbcd** command before writing to media without removing the final CD image. This leaves you with a final Rockridge Image that may be burned to CD/DVD at a later time. The `backup_image` file system and the `cd_fs` file system will be removed thereby leaving only the `cd_image` file system with the Rockridge Image (iso). If you select this option, you will have to manually burn the image to CD/DVD yourself using the GNU `burn_cd` function instead of using SysBack.

Device name for remote volume prompt
> Default=(Blank/None). Enter a TTY, LFT or PTS device name to send the volume prompt to a specified device rather than to the current SMIT screen. If you are backing up to a remote host, the device name you specify is attached to the remote host. This field is displayed only when the backup device is a tape drive or virtual device.

Examples of device names are */dev/tty0*, */dev/lft0* and */dev/pts/5*. You can determine the terminal device name by typing `tty` at the command line on that device.

Debug Output?
Sets the environment variable `SBDEBUG=1` to enable debugging of SysBack programs.

Build Temp Workspace(s) on?
This field is based on if you chose a local or remote device in the device selector screen. If you selected a local device, this will be set to N/A. If you selected a device on a remote host, you have two options for determining where the work spaces will be created. The values are:

Server Specify this option to create the `backup_image`, `cd_fs`, and `cd_image` file systems on the remote system. You may optionally use the **Remote Volume Group for creation of filesystems** option to specify which volume group on the remote system in which the 3 file systems will be created.

Client Specify this option to create the `backup_image`, `cd_fs`, and `cd_image` file systems on the local system and the "cd_image" file system on the remote system. You may optionally use the **Local Volume Group for creation of filesystems** option to specify which volume group on the remote system in which to create the `cd_image` file system.

Hostname of CD/DVD Server
Specify the hostname of the remote system where the work space will be created. This option is only valid when **Build Temp Workspace(s) on?** is set to `Server` or `Client`.

Location of Software Packages to copy to CD/DVD.
Specify the device or directory containing AIX device and/or kernel support filesets in the bffcreate format for use in either creating boot images or for use as Post Install Device support. This flag is required with the **Platform type(s) for CD/DVD boot images** set to `all`, and optional with any other combination.

File with list of packages to copy to CD/DVD.
Specifies a file that contains a list of additional software packages that will be stored in the **/usr/sys/inst.images** subdirectory of the `cd_fs` file system. This option requires the use of the **Location of Software Packages to copy to CD/DVD** as these packages will be copied from that file system or device. This would be useful when there are AIX file sets that you would like to have installed, but are not considered required device or kernel support filesets. You may also store other third party software product that you would like to be automatically installed.

Hostname to Backups
Definition

Append Backup to DVD
Definition

File system to store CD/DVD file structure
Specify the name of an existing file system to be used in place of the default `cd_fs` file system. You must ensure that there is enough space in this file system as outlined in the "Space - ISO Format" on page 69 and "Space - UDF Format" on page 70 sections of Chapter 5. Chapter 5,

"Backups to CD or DVD," on page 69. If this option is not specified, the default cd_fs file system created is **/mksbcd/cd_fs**. If there is not enough space in this file system, the mksbcd command will enlarge the file system with the AIX **/usr/sbin/chfs** command to make it large enough. If the chfs command fails, then so will mksbcd. Also, this file system will not be automatically removed by the mksbcd command. However, it's contents will be removed unless you specify the **Do not remove the final CD images** option.

File system to store final CD/DVD image
Specify the name of an existing file system to be used in place of the default cd_image file system. You must ensure that there is enough space in this file system as outlined in the "Space - ISO Format" on page 69 and "Space - UDF Format" on page 70 sections of Chapter 5. Chapter 5, "Backups to CD or DVD," on page 69. If this option is not specified, the default cd_image file system created is **/mksbcd/cd_image**. If there is not enough space in this file system, the mksbcd command will enlarge the file system with the AIX **/usr/sbin/chfs** command to make it large enough. If the chfs command fails, then so will mksbcd. Also, this file system will not be automatically removed by the mksbcd command. However, it's contents will be removed unless you specify the **Do not remove the final CD images** option.

Local Volume Group for creation of filesystems
Specify this option when you do not want the default backup_image, cd_fs, and cd_image file systems created in the rootvg volume group. This only applies when the **Hostname of CD/DVD Server** option is used.

Remote Volume Group for creation of filesystems
Specify this option when you do not want the default backup_image, cd_fs, and cd_image file systems created in the rootvg volume group. This only applies when the **Hostname of CD/DVD Server** option is used.

Do not remove the final CD images
Specify this option when you do not want the mksbcd process to remove one or more of the default created file systems. Specify one or more of the following combinations:

C   Do not remove the cd_fs file system

I   Do not remove the cd_image file system

This value may be specified as CI or C I.

3. Press Enter to begin creation of the bootable CD or DVD.

Changing SysBack Tape Boot Defaults

Use the **Change SysBack Tape Boot Defaults** menu to set tape boot defaults. Setting tape defaults will let you minimize, possibly eliminate, user prompting during a tape boot or installation process. You must set these options before the backup is executed, or boot only tape created, in order to ensure that these settings are captured on the media. It is the file that is used during the boot and installation process that processes these specifications.

This is similar to the **Set Network Install Client Defaults** menu for network boot or installation processes.

To set the Tape Boot Defaults:

1. From the **Utilities Menu**, select **Change SysBack Tape Boot Defaults**.

   Note: From a command line, type smit sb_cfginsttape.

2. The following screen is displayed:

```
                  Change Sysback Tape Boot Defaults


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  Perform no-prompt installation          yes
   THE FOLLOWING ARE REQUIRED FOR NOPROMPT INSTALL
  Console Device Name              [/dev/1ft]
  Console Terminal Type (if ascii)         []
  Non-rootvg Volume Group Option         Restore all VGs
  Restore Device (if different than boot device)   []
  Backup Sequence Number (if tape)        [2]
  Remove Sysback from foreign client after install?  yes
  Remove Network Config from foreign client?     yes
  Install Addtional Device Driver Support?     None
  Software Install Device            []
  Debug Logging?                yes
    THE FOLLOWING WILL OVERRIDE INSTALL FILES ON
    THE BACKUP MEDIA:
  Post-Install Script              []
  LVM Information File              []
     DEVICE CONFIGURATION OPTIONS:
 Recover Devices            Classic
 Post First Boot Install Script        []



 F1=Help            F2=Refresh         F3=Cancel          F4=List
 F5=Reset           F6=Command         F7=Edit            F8=Image
 F9=Shell           F10=Exit           Enter=Do
```

Figure 159. The Change SysBack Tape Boot Defaults Menu

The fields have the following definitions:

Perform No-Prompt Installation?

Perform No-Prompt Installation specifies whether or not the client to be installed will be prompted. If this field is set to no, the installation menus will appear after a network boot. Otherwise, the install will take place after the network boot without prompting the user if all the required information has been provided. The default is no.

Console Device Name

To prevent the prompt shown prior to the installation menus that determines which console should be used for the installation, you must enter the name of the console device here. This may be either an LFT (graphical display) or TTY (ASCII display) device. Examples are /dev/1ft0 or /dev/tty0. If an LFT device exists on the client, it may also be selected by typing /dev/console. The default is none/blank.

Note: You must select the display, even for a No-prompt install. You will then be able to receive any error or warning messages and allow for prompts if the default information provided is insufficient to complete the install.

Console Terminal Type (if ASCII)

If the console device is an ASCII terminal, or tty device, you must

select a specific terminal type. This ensures that installation menus, if required, are displayed with the correct terminal emulation. You may enter the device type or press F4 to display a list of all terminal types defined on the server and select from the list. Examples of common terminal types are "ibm3151", "tvi925", and "vt100." The default is `none/blank`.

Non-rootvg Volume Group Option

The default is set at `Restore Rootvg Only`. The following is a description of each option.

Restore Rootvg Only

Only the rootvg volume group will be created and restored from the media, even if there are other volume groups defined in the backup. At the end of the install only the rootvg will be defined.

Restore All VGs

All volume groups that are included on the backup media will be created and restored. Volume groups that were defined on the original system but whose data was not included in the backup will be created but no data will be restored.

Import Non-Rootvgs

The rootvg volume group will be created and restored. All other volume groups will be imported from disks on the client. This option assumes that non-rootvg volume groups already exist on the client. You typically use this option when restoring the rootvg volume group after a system failure and no other volume groups have been affected.

Restore Device or File

The options which appear are those made available using **Add or Change Client Host Access to this Server** under the **Remote Services** menu. You must select an option from this list to prevent being prompted for an install device or file during the installation process. The default is `none/blank`. For more information on defining these resource, please refer to Chapter 10, "Remote Services," on page 127.

Backup Sequence Number (if tape)

If the client is to be installed from tape, and the System Backup to be installed is not the first System Backup on the tape, enter the Backup Sequence Number. This number must be between 1 and the total number of System Backups on the tape media. The default is `none/blank`.

Remove SysBack from Foreign Client After Install

This `yes` or `no` field indicates whether to remove the SysBack program from the system after an installation. This is useful when the user has not purchased a license for the client that will be installed. The default is `no`.

Remove Network Config from Foreign Client

This `yes` or `no` field indicates whether to remove network specific information required to configure the host to the network. This option is useful when the machine installed was cloned from a backup image of a machine that is still present on the network. The default is `no`.

Install Additional Device Driver Support?
This option tells SysBack how much to install of what is contained in the media in the location specified by the **Software Install Device** option. The two options are:

Minimum
Selecting this option will install only those device support filesets identified by AIX when the system was booted. This information is obtained from the file **/tmp/devices.pkgs** which is created by AIX when the system was booted. This file is not always 100% accurate regarding what device support is needed as some devices return invalid installp package names rather than individual filesets. In most cases, however, this is a reliable alternative to pre-installing all device support filesets on to a system prior to creating the backup image.

All
Selecting this option tells SysBack to perform an install command against every item contained on the media in the specified location. This may include device support filesets or any other software that is located on the media.

Software Install Device
This option lets you specify a CD-ROM device name, a tape device name, or a NIM **LPPSOURCE** directory name. The NIM **LPPSOURCE** directory name provides additional device support to install during installation. This device support, if available in the specified location, will be installed in circumstances where the needed device support for this machine is contained in the boot image but not the backup image to be installed.

If this is a NIM Resource Network Boot, SysBack will automatically pulls device support from the NIM **LPPSOURCE** specified when the Network Boot client was added regardless of whether this option is edited. For more information on configuring a NIM Resource Network Boot, please refer to Chapter 15, "Network Boot/Installation Configuration," on page 207.

Debug Logging
This yes or no field indicates whether to turn on debug logging operations for troubleshooting network boot and installation problems. The default is no.

Post-Install Script
Enter a filename to include a post installation script on the customized installation diskette. If it exists, this file will be executed at the end of the installation process before the system reboots. This can be used, for instance, to execute the sample script **/usr/lpp/sysback/scripts/install.post_rmnet** which removes the network configuration from the restored system data to prevent any prompts at the end of the SysBack installation process.

LVM Information File
Enter a filename to include an LVM information file stored on a customized installation diskette. Doing so replaces the LVM information contained on the backup and is typically used to apply many changes to the LVM information without requiring the user to do so using the installation menus. For more information about how to

create a customized LVM information file, please refer to the"Creating or Editing an LVM Information File" on page 293 section of this chapter.

Recover Devices

The "Recover Devices" option provides 3 choices: "CLASSIC" , "Y" , and "N". This is an advanced AIX administration concept that should only be manipulated by those familiar with the AIX ODM and the AIX RDA program. The default option is "CLASSIC".

The "CLASSIC" option indicates that SysBack will process device configuration during the system installation process as it has always done prior to the implementation of this option. In the "CLASSIC" scenario, SysBack will merge the ODM device entries that were created and used by the AIX RAM FS during the initial phase of the system installation process, with the ODM stored in the backup image.

The "Y" option indicates that the ODM entries will be recovered only from the backup image. Using this option is sometimes useful in environments where devices have been given AIX names in an order that is different than how the operating system detects those devices on boot. A common example of this is seen in environments that have multiple port RAN devices with hundreds of "tty" devices attached.

The "N" option indicates that the ODM entries will not be recovered from the backup image. Only those devices that are detected during the system boot process will be configured. These devices will be configured with the default options. Any customized device attributes will be lost.

It is important to note that widely unpredictable results can be seen when using the "Y" and "N" options depending on your system configuration, or if you are cloning, or even if you are simply restoring a backup image to the same hardware. Use this option with extreme caution. If you encounter results other than you expected after specifying the "Y" or "N" options, simply perform the system installation process again and let the process default to "CLASSIC".

Tip:

Use the "CLASSIC"option if:

- you are unfamiliar with the AIX ODM or the AIX RDA program and do not have a specific need to manipulate how the operating system and SysBack detect and configure the devices
- you are cloning the backup image to a new machine that does not have exactly, 100% the same hardware configuration

Use the "Y" option if:

- you are restoring the backup image on the same machine as where the backup image was created.

Use the "N" option if:

- the state of your devices and their definitions is dramatically inconsistent. Using this option under these circumstances will cause the operating system to only configure physically detectable devices to their defaults. You may then begin redefining your other devices and device attributes from scratch.

Filename of Post first boot install script

The file may be located and named as you choose as long as it resides

in the root volume group. This script is executed as a part of the first reboot process after all data is restore. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well.

Changing SysBack CD/DVD Boot Defaults

Use the **Change SysBack CD/DVD Boot Defaults** menu to set boot defaults for CD or DVD media. Setting these defaults will let you minimize, possibly eliminate, user prompting during a CD/DVD boot or installation process. These defaults are stored in a file on the system. Therefore, you must set these options before the backup is executed, or boot only CD/DVD created, in order to ensure that this file is included in the boot image. It is the file that is used during the boot and installation process that processes these specifications.

This is similar to the **Set Network Install Client Defaults** menu for network boot or installation processes.

To set the CD/DVD Boot Defaults:
1. From the Utilities menu, select **Change SysBack CD/DVD Boot Defaults**.

   Note: From a command line, type `smit sb_cfginstcd`.

2. The following screen is displayed:

```
                    Change Sysback CD/DVD Boot Defaults


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                [Entry Fields]
  Perform no-prompt installation                 yes
   THE FOLLOWING ARE REQUIRED FOR NOPROMPT INSTALL
  Console Device Name                            [/dev/lft]
  Console Terminal Type (if ascii)               []
  Non-rootvg Volume Group Option                 Restore all VGs
  Restore Device (if different than boot device) []
  Backup Sequence Number (if tape)               [2]
  Remove Sysback from foreign client after install? yes
  Remove Network Config from foreign client?     yes
  Install Addtional Device Driver Support?       None
  Software Install Device                        []
  Debug Logging?                                 yes
    THE FOLLOWING WILL OVERRIDE INSTALL FILES ON
    THE BACKUP MEDIA:
  Post-Install Script                            []
  LVM Information File                           []
  Recover Devices                                Classic
  Post First Boot Install Script        []



 F1=Help           F2=Refresh        F3=Cancel         F4=List
 F5=Reset          F6=Command        F7=Edit           F8=Image
 F9=Shell          F10=Exit          Enter=Do
```

Figure 160. The Change SysBack CD/DVD Boot Defaults Menu

The fields have the following definitions:

Perform No-Prompt Installation?

Perform No-Prompt Installation specifies whether or not the client to be installed will be prompted. If this field is set to no, the installation menus will appear after a network boot. Otherwise, the install will take place after the network boot without prompting the user if all the required information has been provided. The default is no.

Console Device Name

To prevent the prompt shown prior to the installation menus that determines which console should be used for the installation, you must enter the name of the console device here. This may be either an LFT (graphical display) or TTY (ASCII display) device. Examples are /dev/lft0 or /dev/tty0. If an LFT device exists on the client, it may also be selected by typing /dev/console. The default is none/blank.

Note: You must select the display, even for a No-prompt install. You will then be able to receive any error or warning messages and allow for prompts if the default information provided is insufficient to complete the install.

Console Terminal Type (if ASCII)

If the console device is an ASCII terminal, or tty device, you must select a specific terminal type. This ensures that installation menus, if required, are displayed with the correct terminal emulation. You may enter the device type or press F4 to display a list of all terminal types

defined on the server and select from the list. Examples of common terminal types are "ibm3151", "tvi925", and "vt100." The default is none/blank.

Non-rootvg Volume Group Option
The default is set at Restore Rootvg Only. The following is a description of each option.

Restore Rootvg Only
Only the rootvg volume group will be created and restored from the media, even if there are other volume groups defined in the backup. At the end of the install only the rootvg will be defined.

Restore All VGs
All volume groups that are included on the backup media will be created and restored. Volume groups that were defined on the original system but whose data was not included in the backup will be created but no data will be restored.

Import Non-Rootvgs
The rootvg volume group will be created and restored. All other volume groups will be imported from disks on the client. This option assumes that non-rootvg volume groups already exist on the client. You typically use this option when restoring the rootvg volume group after a system failure and no other volume groups have been affected.

Restore Device or File
The options which appear are those made available using **Add or Change Client Host Access to this Server** under the **Remote Services** menu. You must select an option from this list to prevent being prompted for an install device or file during the installation process. The default is none/blank. For more information on defining these resource, please refer to Chapter 10, "Remote Services," on page 127.

Backup Sequence Number (if tape)
If the client is to be installed from tape, CD, or DVD, and the System Backup to be installed is not the first System Backup on the media, enter the Backup Sequence Number. This number must be between 1 and the total number of System Backups on the media. The default is none/blank.

Remove SysBack from Foreign Client After Install
This yes or no field indicates whether to remove the SysBack program from the system after an installation. This is useful when the user has not purchased a license for the client that will be installed. The default is no.

Remove Network Config from Foreign Client
This yes or no field indicates whether to remove network specific information required to configure the host to the network. This option is useful when the machine installed was cloned from a backup image of a machine that is still present on the network. The default is no.

Install Additional Device Driver Support?
This option tells SysBack how much to install of what is contained in the media in the location specified by the **Software Install Device** option. The two options are:

Minimum

Selecting this option will install only those device support filesets identified by AIX when the system was booted. This information is obtained from the file **/tmp/devices.pkgs** which is created by AIX when the system was booted. This file is not always 100% accurate regarding what device support is needed as some devices return invalid installp package names rather than individual filesets. In most cases, however, this is a reliable alternative to pre-installing all device support filesets on to a system prior to creating the backup image.

All   Selecting this option tells SysBack to perform an install command against every item contained on the media in the specified location. This may include device support filesets or any other software that is located on the media.

Software Install Device

This option lets you specify a CD-ROM device name, a tape device name, or a NIM **LPPSOURCE** directory name. The NIM **LPPSOURCE** directory name provides additional device support to install during installation. This device support, if available in the specified location, will be installed in circumstances where the needed device support for this machine is contained in the boot image but not the backup image to be installed.

If this is a NIM Resource Network Boot, SysBack will automatically pulls device support from the NIM **LPPSOURCE** specified when the Network Boot client was added regardless of whether this option is edited. For more information on configuring a NIM Resource Network Boot, please refer to Chapter 15, "Network Boot/Installation Configuration," on page 207.

Debug Logging

This yes or no field indicates whether to turn on debug logging operations for troubleshooting network boot and installation problems. The default is no.

Post-Install Script

Enter a filename to include a post installation script on the customized installation diskette. If it exists, this file will be executed at the end of the installation process before the system reboots. This can be used, for instance, to execute the sample script **/usr/lpp/sysback/scripts/install.post_rmnet** which removes the network configuration from the restored system data to prevent any prompts at the end of the SysBack installation process.

LVM Information File

Enter a filename to include an LVM information file stored on a customized installation diskette. Doing so replaces the LVM information contained on the backup and is typically used to apply many changes to the LVM information without requiring the user to do so using the installation menus. For more information about how to create a customized LVM information file, please refer to the"Creating or Editing an LVM Information File" on page 293 section of this chapter.

Recover Devices

The "Recover Devices" option provides 3 choices: "CLASSIC" , "Y" , and "N". This is an advanced AIX administration concept that should

only be manipulated by those familiar with the AIX ODM and the AIX RDA program. The default option is "CLASSIC".

The "CLASSIC" option indicates that SysBack will process device configuration during the system installation process as it has always done prior to the implementation of this option. In the "CLASSIC" scenario, SysBack will merge the ODM device entries that were created and used by the AIX RAM FS during the initial phase of the system installation process, with the ODM stored in the backup image.

The "Y" option indicates that the ODM entries will be recovered only from the backup image. Using this option is sometimes useful in environments where devices have been given AIX names in an order that is different than how the operating system detects those devices on boot. A common example of this is seen in environments that have multiple port RAN devices with hundreds of "tty" devices attached.

The "N" option indicates that the ODM entries will not be recovered from the backup image. Only those devices that are detected during the system boot process will be configured. These devices will be configured with the default options. Any customized device attributes will be lost.

It is important to note that widely unpredictable results can be seen when using the "Y" and "N" options depending on your system configuration, or if you are cloning, or even if you are simply restoring a backup image to the same hardware. Use this option with extreme caution. If you encounter results other than you expected after specifying the "Y" or "N" options, simply perform the system installation process again and let the process default to "CLASSIC".

Tip:

Use the "CLASSIC"option if:

- you are unfamiliar with the AIX ODM or the AIX RDA program and do not have a specific need to manipulate how the operating system and SysBack detect and configure the devices
- you are cloning the backup image to a new machine that does not have exactly, 100% the same hardware configuration

Use the "Y" option if:

- you are restoring the backup image on the same machine as where the backup image was created.

Use the "N" option if:

- the state of your devices and their definitions is dramatically inconsistent. Using this option under these circumstances will cause the operating system to only configure physically detectable devices to their defaults. You may then begin redefining your other devices and device attributes from scratch.

Filename of Post first boot install script
The file may be located and named as you choose as long as it resides in the root volume group. This script is executed as a part of the first reboot process after all data is restore. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well.

Changing the Read Permission on a Disk Image File

When you back up to a disk image file, you can set the read permission of the file to allow only the original host and/or original user to read from the file. You might need to change this permission at a later time if, for instance, you need to use an image file with "original host only" permission as a network installation image for other systems.

Using the **Change Read Permission on a Disk Image File** option, you can change the owner of the file (host and/or user), the backup description, if any, or the host or user read permission.

Only the following users have permission to change the read permission of a disk image file:

- Root user on the system where the file physically resides
- Root user on the system from which the file originated
- User on the system who originally wrote the file

To change the permissions of an existing disk image file:

1. From the **Utilities Menu**, select **Change Read Permission on a Disk Image File**.

2. Select the disk image file you want to change from the list displayed. This list displays all the files in the backup or installation image directories assigned to the current user.

   Root users can change files that are not on this list. To do this, select any file from this list and change it on the **Change Read Permission on a Disk Image File** screen that follows.

3. The following screen is displayed:

```
                Change Read Permission on a Disk Image File


 Type or select values in entry fields.
 Press Enter AFTER making all desired changes.

                                                  [Entry Fields]
   Hostname (where file resides     hambone.austin.ibm.com
   File Name             [/sysback.images/lasher>
   Hostname (owner of file)     [lasher]
   User name (owner of file)    [root]
   Host read permission     all hosts
   User read permission     all users
   User description         []



 F1=Help             F2=Refresh         F3=Cancel          F4=List
 F5=Reset            F6=Command         F7=Edit            F8=Image
 F9=Shell            F10=Exit           Enter=Do
```

Figure 161. The Change Read Permission on a Disk Image File Menu

The fields have the following meanings:

Hostname (where file resides)
> The name of the host where the file resides, if a remote file was selected on the prior selection screen. You cannot change this field on this screen.

File name

The name of the file selected on the prior screen. You cannot change this field on this screen.

Hostname (owner of file)

Default=(current owner). The hostname.

Note that, if the **Host read permission** field is set to "this host only", changing the owner of the file to a new host prevents the original host from accessing the file. The root user on the server in which the file physically resides can always access the file.

User name (owner of file)

Default=(current owner). The user name.

Note that, if the **User read permission** field is set to "this user only", changing the owner of the file to a new user will prevent the original user from accessing the file. The root user on the host that owns the file, or the root user on the server in which the file physically resides will always be able to access the file.

Host read permission

Default=(current host read permission). Press Tab to change the field from its current value to a new value. The possible values are:

this host only The file can be read only by the host that owns the file. Either the root user on that host or the user who owns the file, if different, can read it. The root user on the server where the file physically resides can also access the file.

all hosts The file can be read by any host on the network. You can still limit access permission by the user name.

User read permission

Default=(current user read permission). Press Tab to change the field from its current value to a new value. The possible values are:

this user only The file can only be read by the user who owns the file. The root user on the host that owns the file, or root on the server on which the file physically resides, can also access the file. Limit read permission of the file to only the host that owns the file. If not, the file can be read by this user from any host on the network.

all users The file can be read by any user. The access permission can be limited to the host that owns the file. If not, any user on the network can read the file.

User description

Default=(current user description, if any). The backup description specified by the user when the backup was created. This description, up to 60 characters, can be changed by entering the new description in this field. Do not include single (') or double (") quotes in this field.

4. Press `Enter` to change the file or press `F3` key at any time to exit without saving any changes.

Creating or Editing an LVM Information File

An *LVM information file* is created by the **mkvginfo** command as part of all SysBack backups that contain LVM (logical volume manager) information. This file is then used either when reinstalling the system from a backup or recreating volume groups, logical volumes, or file systems from a backup.

You might want to create your own LVM information file and tailor it to your needs. This customized LVM information file can then be placed on the backup by using the **-g** flag to either the **sysback**, **mkvgback**, **mkjfsback** or **mklvback** commands. The customized LVM information file can also be written to a diskette and used to replace the information on an existing system backup during a system installation. Refer to the "Creating a Custom Installation Diskette" on page 294 section of this chapter for additional details.

To edit an existing LVM information file or create a new LVM information file from the information on the current system and edit the new file:

1. From the **Utilities Menu**, select **Create or Edit an LVM Information File**.
2. Enter the name of an existing file or the name of a new file to create.
3. Select the type of backup for the new file. Choose from the following types:

    S   System Backup

    P   Power System Backup

    V   Volume Group Backup

    L   Logical Volume or File system Backup

    Select the type of file to create based on the backup the file will be used with. If you select a type that does not match the actual backup media, errors can prevent the backup media from being restored properly.
4. If you are creating a new file and you specified the `system`, `power`, or `volume group` backup type, select the volume group whose data is on the backup. To select a single volume, highlight the volume group and press `Enter`. To select multiple volume groups, highlight each volume group and press `F7`. When you have selected all entries, press `Enter` to continue.

    It is important to indicate in this field which volume groups are actually included on the backup. Not doing so prevents the volume group data from being restored during a system installation. Regardless of which volume groups are included in the backup data, any volume group can be recreated from this backup, either during the system installation process or when recreating volume groups on an active system.

The LVM file is created or checked for consistency with the system configuration, and then a screen similar to the following is displayed:

```
         +-------------------------------------------------------+
         |      Change Volume Group & Logical Volume Information  |
         +-------------------------------------------------------+


                    Select Physical Volumes for Volume Groups
                         Change Volume Group Attributes
                   Select Physical Volumes for Logical Volumes
                         Change Logical Volume Attributes
                          Change Filesystem Attributes
                             Advance Install Options



  +----------------------------------------------------------------------+
  | Select this option to change the physical volumes which are assigned to each |
  | volume group.                                                        |
  +----------------------------------------------------------------------+
  | Use ARROW or Tab keys to move and ENTER to Select. Press ESC for Main Menu. |
  +----------------------------------------------------------------------+
```

Figure 162. The Change Volume Group & Logical Volume Information Menu

The options for volume groups are not displayed when you select to create or edit a file for a logical volume or file system backup. Also, if this is a power backup, the option for changing file system information does not appear. These menus provide options for changing virtually all attributes for volume groups, logical volumes, and file systems. This process is identical to that for reinstalling a system from a system backup. Therefore, in both cases, the detailed steps for changing this information is provided in Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

Creating a Custom Installation Diskette

You can customize the system installation process by using a customized installation diskette.

To create a customized installation diskette:

1. From the **Utilities Menu**, select **Create a Custom Installation Diskette**.

   Note: From the command line, type `smitty sb_mkinstdskt`.

2. The following screen is displayed:

```
                        Create Custom Installation Diskette


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                    [Entry Fields]
  Output device name                              [/dev/fd0]
  Format diskettes before copying?        no
  Filename of LVM Information File                []
  Filename of Pre-Installation Script             []
  Filename of Post-rootvg Install Script          []
  Filename of Post-Installation Script            []
  Filename of Post First Boot Install Script   []




  F1=Help            F2=Refresh        F3=Cancel          F4=List
  F5=Reset           F6=Command        F7=Edit            F8=Image
  F9=Shell           F10=Exit          Enter=Do
```

Figure 163. The Create Custom Installation Diskette Menu

The fields have the following meanings:

Output device name
> Default=diskette device (/dev/fd0). A diskette drive name. If there is
> more than one diskette drive on your system, press F4 to display the
> available diskette drives and select a drive from the list.

Format diskette before copying?
> Default=no. If the diskette in the drive has not been formatted, press
> Tab to change this to "yes."

Filename of LVM Information File
> Enter a filename to include an LVM information file on the customized
> installation diskette. Doing so replaces the LVM information contained
> on the backup and is typically used to apply many changes to the LVM
> information without requiring the user to do so using the installation
> menus.

Filename of Pre-installation script
> Enter a filename to include a pre-installation script on the customized
> installation diskette. If it exists, this file is executed prior to the
> installation menus appearing on the screen. This might be used, for
> instance, to restore other information from the diskette or to perform
> some special system configuration not ordinarily performed by the
> installation process.

Filename of Post-rootvg installation script
> Enter a filename to include a post-rootvg installation script on the
> customized installation diskette. If it exists, this file is executed after the
> files for the rootvg volume group are restored.
>
> This is commonly used to execute the sample script
> **/usr/lpp/sysback/scripts/install.postroot_hwmigrate**, provided with
> SysBack, which performs an automatic installation of device code from
> CD-ROM not already included in the system restored from the backup
> media.

Filename of Post installation script
> Enter a filename to include a post installation script on the customized
> installation diskette. If it exists, this file will be executed at the end of

the installation process before the system reboots. This can be used, for instance, to execute the sample script **/usr/lpp/sysback/scripts/ install.post_rmnet** that removes the network configuration from the restored system data to prevent any prompts at the end of the SysBack installation process.

Filename of Post First Boot Script
The file may be located and named as you choose as long as it resides in the root volume group. This script is executed after the all data is restored as a part of the first reboot process. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well. This script must be executable before writing it to this installation diskette.

Note: You may also configure this option in the SysBack Installation and Maintenance Main Menu by defining it in the **Post Device Configuration Options** menu explained in "Post Install Configuration Options" on page 197.

You can find more information on the sample installation scripts provided with SysBack in Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487.

After this diskette has been created, insert the diskette during the system boot process. It is read automatically, and any of the above information files provided are used during the installation process, overriding the same information on the backup media if it exists.

Changing SysBack Program Defaults

Use the **Change SysBack Program Defaults** option to tailor the behavior of certain functions of SysBack. These include the underlying format of the backups, how read errors are handled when reading backup media, and attributes used to tune network performance. This section describes the various parameters that can be changed and the reasons you might choose to do so.

Normally, you do not need to change the default behavior of SysBack. These parameters should not be changed except by experienced users who understand the reasons for doing so, as described below.

To access the menus to change the SysBack program defaults, select **Change SysBack Program Defaults** from the **Utilities Menu**. You can also access these menus by typing `smitty sb_chgsettings` at a command line.

The following screen is displayed. The values shown are the system defaults. If you changed the attributes previously, those values are displayed.

```
                     Change Sysback Program Defaults

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

[MORE...4]                                          [Entry Fields]
  Filesystem Data Backup Command        Backup/Restore

  END OF TAPE (EOT) PROCESSING
  Program For EOT on Write Operations.     []
  Program For EOT on Read Operations.      []
  Email Address For EOT on Write Operations.   []
  Email Address For EOT on Read Operations.    []
  ERROR HANDLING SETTINGS
  Number of data read errors before read failure  [50]
  Number of data sync errors before read failure  [50]
  Maximum number of retries on read errors     [2000]
  Pad missing data with NULLS after sync error?  yes

  SYSBACK NETWORK SETTINGS
  Data Buffer size            []
  TCP Send Buffer size (in bytes)       []
  TCP Receive Buffer size (in bytes)      []
  Force TCP to always send data immediately?   no
[BOTTOM]

F1=Help          F2=Refresh        F3=Cancel        F4=List
F5=Reset         F6=Command        F7=Edit          F8=Image
F9=Shell         F10=Exit          Enter=Do
```

Figure 164. The Change SysBack Program Defaults Menu

The following sections describe the options available from the **Change SysBack Program Defaults** menu.

Backup Format Settings

This section contains options for changing the format of the backup itself. The default format is "Backup/Restore", or the AIX **backup** and **restore** command format.

Although SysBack creates a data format to store information about the backup contents and system information and to enable multi-copy and striped backups, the underlying command used to read and write files within the file systems is the AIX **backup** command.

SysBack now enables the user to use either the AIX **backup** command or the AIX **tar** command for backing up and restoring file system data. When any SysBack backup is restored, SysBack automatically detects the backup type and uses the appropriate corresponding restore command to restore the data.

Note: The **backup** command is the default and should not be changed unless another command provides function that the backup command does not.

To change the file system backup command, press Tab to scroll through the options. You can also press F4 to display a list of the values. The default is "backup/restore."

The **backup** command is used because of its flexibility over other commands and because it backs up data regarding files such as the *access control list* (ACL) and the *trusted computing base* (TCB).

The **backup** command, however, has changed over time in how it backs up and restores "sparse" files. 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. Previous levels of the backup command did not preserve this sparseness, and a sparse file, when restored, expands to include all blocks in the middle of the file, often causing a file system to inadvertently run out of space. The **backup** command was later changed to preserve this sparseness, but this is often a problem for customers experiencing the opposite affect.

If a file is created and all blocks are allocated by writing nulls, or "0s," throughout the file, these blocks of data are not preserved during a restore, because the goal is to preserve sparseness. Because of this, a large file might be restored to a very small size.

SysBack enables you to select the command you want to use to perform backups. This can be either the AIX **backup** and **restore** commands (which preserve sparseness) or the **tar** command (which does not).

End of Tape (EOT) Processing Options

This feature will allow you to specify a network email address, or program to execute, when the end of volume is reached during backup and restore operations.

For multivolume backups, each time the end of tape is reached the configured option will be executed. If you configure this option and have an autoloading device that automatically loads the next tape for you, these actions will still be executed even if no action is required. An example might be in an environment where you would like an email sent at each tape change, even though the library is changing tape for you. This could provide an easy reference indicating the number of volumes in any given backup.

This function is particularly useful in environments that have robotic libraries that require special commands or software to mount and dismount tape volumes. Since SysBack does not interact or control the medium changer in a library, this allows you to create a script that will issues the commands for SysBack for each tape change during a backup or restore.

There are 4 options that can be set to affect the end of tape processing. These are configured on the SysBack server where the tape library is physically attached.

Email Address For EOT on Write Operations.
> Specify the email address to send the message to when end of tape has been reached (triggered by the sbwrite command). This option only affects backup operations.

Email Address For EOT on Read Operations.
> Specify an email address to send the message to when end of tape has been reached (triggered by the sbread and sbfwd commands). This option only affects restore, list, and verify operations. The email title will be like this:

```
SysBack Tape Change on host  "sysback1" for Tape Drive /dev/rmt0 Tape 2
```

> The body would contain this information:

```
        HOST sysback1
        TAPE_DRIVE /dev/rmt0
        TAPE 2
```

Both of these options assume that your email address is valid and that your system is configured such that the email can be sent. SysBack is sending the email via the AIX `mail` command. It is the customer's responsibility to properly configure their mail options. This might be useful when you would like and email sent to a particular "Computer Operator" each time a tape needs to be changed, or simply for record keeping purposes.

Program For EOT on Write Operations.
Specify this option to force SysBack to execute the specified script/program when the end of tape is reached (triggered by the sbwrite and sbfwd commands). You must specify the fully qualified path to the script/program and it must be present on the same physical machine as where the tape drive/library is located. This option only applies to backup operations.

Program For EOT on Read Operations.
Specify this option to force SysBack to execute the specified script/program when the end of tape is reached (triggered by the sbread command). You must specify the fully qualified path to the script/program and assumes that it is present on the same physical machine as where the tape drive or library is located. This option only applies to restore operations.

Both of these options would be used in a situation whereby you did not have an autoloading library, but instead a robotic library that requires special commands to move the robot arm for picking up and moving tapes. You could write your own script or program to manipulate the tapes when the end of volume is reached. Three command line arguments will be passed to your program. You may take advantage of them if you choose. They are:

•

  $1   This argument represents the device that requires the tape change. The value will be in the form of `/dev/rmt0`.

•

  $2   This argument represents the hostname of the client whose data is being backed up. It should be in the form of what is returned by running the" `hostname`" command on that client

•

  $3   This argument represents the value of the next tape to load. For example, at the end of tape one, this value would be "2" since the 2nd volume that should loaded.

As an example configuration, let's assume that when the backup's "sbwrite" command hits the end of tape of tape one, and needs to span to tape two, (assuming that this is only a two tape backup), you would specify the program name in SMIT like so:

`PROGRAM_WRITE change_tape`

Therefore, when the end of the first tape was reached on host `sysback1`, SysBack would execute this command:

`change_tape /dev/rmt0 sysback1 2`

Where `change_tape` might be a shell script like the below example.

> **Note:** The `tapeutil` command is a sample program that comes with the IBM
> **Atape.driver** fileset. This is the device driver that controls IBM Magstar®
> tape devices. This is not a SysBack command.

```
#!/bin/ksh
DEVICE=$1
HOST=$2
TAPE=$3
case $TAPE in
2) tapeutil -f /dev/smc0 move 23 10
      tapeutil -f /dev/smc0 move 11 23
;;
3) tapeutil -f /dev/smc0 move 23 11
      tapeutil -f /dev/smc0 move 12 23
;;
4) tapeutil -f /dev/smc0 move 23 12
      tapeutil -f /dev/smc0 move 13 23
;;
5) tapeutil -f /dev/smc0 move 23 13
      tapeutil -f /dev/smc0 move 14 23
;;
esac
```

When performing remote backups, the user who will be running your program or
script is the `sbnet` user. You will need to accommodate this accordingly if there are
commands in your program or script that require root user authority. Also, the
read and execute permissions on your program or script must be set to allow the
`sbnet` user to run it.

Error Handling Settings

This section provides options for controlling the way read errors are handled when
reading from SysBack backup media. Although SysBack itself provides a reliable
backup, the media on which the backup is placed can sometimes become corrupt.

The fields have the following meanings:

Number of data read errors before read failure
> Default=50. When SysBack encounters a read error from the media device
> driver, by default, it attempts to read up to the number of times specified
> in the **Maximum number of retries on read errors** field. If SysBack is
> unable to read the data, a read error is produced, and SysBack either skips
> the missing data entirely or pads the missing data with NULL bytes, as
> defined by the **Pad missing data with NULLs after sync errors** field.
>
> This option enables you to specify the maximum number of read errors
> that are produced before the backup fails. Specify any number up to 32768
> in this field or use a zero (0) to indicate that the reading fails after the first
> read error.

Number of data sync errors before read failure
> Default=50. The backup is read for each buffer, defined by the buffer size
> of the backup. At the beginning of each buffer is a special key that ensures
> that the data is being read at the correct point. A "data sync" error occurs
> when the key is not encountered or the key has an incorrect sequence
> number.
>
> When a sync error occurs, SysBack either skips the missing data altogether
> or pad the missing data with NULL bytes, as defined by the **Pad missing
> data with NULLs after sync errors** field.

This field determines the maximum number of sync errors that can occur before the reading fails. The value of this field can be any number up to 32768. Using a value of zero (0) indicates that the reading should abort after the first sync error.

Maximum number of retries on read errors

Default=2000. When a read error occurs, by default SysBack attempts to reread the same buffer of data up to the number of times specified by this field. The reading fails when a read error occurs and has been retried the number of times indicated. You can enter a number up to 32768. An entry of zero (0) indicates that no retries should be attempted.

Note: Most tape devices, including 8MM tape drives, return an error very quickly when a read error occurs and allows retries to be attempted from the same data location. Others, such as DDS 4MM tape drives, can take up to 2 minutes to return from a read error. These tape devices also do not allow read retries, but still take two minutes to return from an attempt. Therefore, for these, and similar devices, set this value to zero (0), because retries are not supported and any attempts appear to pause the reading indefinitely.

Pad missing data with NULLs after sync errors?

Default=yes. When a data sync error occurs, assuming the reading is set up to continue, the missing data is padded with NULL bytes by default. This is to ensure that, although the data has been altered, it remains in the correct alignment.

Note: It is very important for the data to remain in the correct alignment when restoring raw logical volume backups. If you do not pad sync errors with NULL bytes, all of the data following the error is restored to a different location than expected. Volume group, file system, and file/directory backups use an underlying restore command that is capable of resynchronization when there is missing data in the data stream. Therefore, the value of this field is less relevant when restoring from these backup types. However, the restore command sometimes fails when it encounters a large stream of NULL bytes. In this case, change this value to "no."

SysBack Network Settings

By tuning certain network parameters, you can increase the performance of SysBack backups and restores. You can set certain values that affect network performance during SysBack backups and restores without affecting network performance of other processes using the same network.

Note: Do not change the network settings using this option unless you are familiar with network tuning. Also, you must apply the same settings to both the SysBack server and client hosts.

In most situations, the default settings are adequate. The settings appropriate for achieving the greatest performance on different systems and networks vary widely, so no specific guidance can be given here. Refer to Appendix E, "Device and System-Specific Information," on page 493 for any specific recommendations.

The following fields are displayed in the SysBack Network Settings section:

Data buffer size

Default=32768 (32 Kbytes). The size of the buffer of data that is written to the network socket in a single write operation.

TCP Send Buffer size (in bytes)

Default=16384 (16 Kbytes). The TCP "send buffer" size, equivalent to the *tcp_sendspace* parameter of the AIX "**no**" command. If the send buffer size is greater than 64 Kbytes, the RFC1323 TCP parameter, which is equivalent to the *rfc1323* parameter of the AIX "**no**" command, is enabled automatically.

TCP Receive Buffer size (in bytes)

Default=16384 (16 Kbytes). The TCP "receive buffer" size, equivalent to the *tcp_recvspace* parameter of the AIX "**no**" command. If the receive buffer size is greater than 64 Kbytes, the RFC1323 TCP parameter, which is equivalent to the *rfc1323* parameter of the AIX "**no**" command, is enabled automatically.

Force TCP to always send data immediately?

Select "yes" by pressing Tab if you want to send TCP packets immediately. Otherwise, a value of "no" indicates that small amount of data should be collected into single packets before being sent.

When all entries are completed, press Enter to apply the changes.

Note: The changes take affect only during SysBack backups, verifies, and restores, and have no affect on other system network operations. The changes applied here do not apply to a SysBack system installation; as it is not possible to query the values set during the installation process.

Logging

This menu provides options for manipulating the SysBack Activity Log. For more information related to this topic, please refer to Chapter 21, "Logging," on page 319.

Chapter 19. Copying Backups to a New Media Type

You can transfer a backup that exists in one media source to another. For example, if you normally perform backup your SysBack System Installation Image backups to files on disk, but later need to make a bootable backup tape out of them, you would use the **Device to Device Copy** menus. There are three different menu options:

- Copy Backup Disk Image or CD/DVD to Tape
- Copy Backup Tape to Backup Disk Image
- Copy Backup Tape to Backup Tape

These three options provide the ability to:

- Copy backups from files on disk to tape
- Copy backups from CD/DVD to tape
- Copy backups from tape to files on disk
- Copy backups from tape to tape
- Copy backups from tape to disk, and then burn them back to CD or DVD

Note: These utilities do not support backups stored in a Tivoli Storage Manager server, or using a Tivoli Storage Manager server as the output device.

To access the **Device to Device Copy** menus:

1. At a command line, type `smitty sysback`.
2. Select **Device to Device Copy** which will display the following screen:

```
                    Device to Device Copy

Move cursor to desired item and press Enter.

  Copy Backup Disk Image or CD/DVD to Tape
  Copy Backup Tape to Backup Disk Image
  Copy Backup Tape to Backup Tape




 F1=Help            F2=Refresh          F3=Cancel          F8=Image
 F9=Shell           F10=Exit            Enter=Do
```
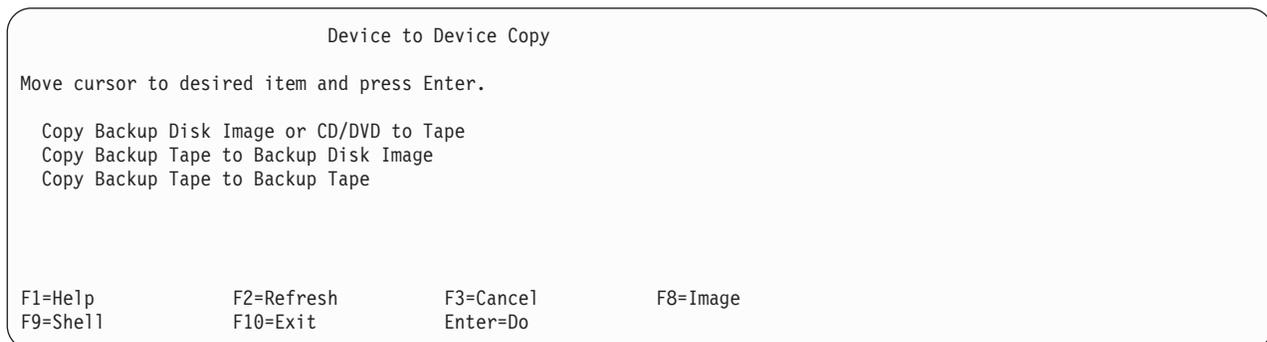
Figure 165. The Device to Device Copy Menu

Copy Backup from Disk Image or CD/DVD to Tape

To copy a backup image stored in a disk image file to a bootable CD/DVD or Tape drive, use the **Copy Backup from Disk Image or CD/DVD to Tape** menu.

Note: These utilities do not support backups stored in a Tivoli Storage Manager server, or using a Tivoli Storage Manager server as the output device.

1. Select the Full System Disk Image Backup file or CD/DVD device where the backup is stored.
2. Select tape drive or virtual device to use as the output device. You will be presented with the following menu:

```
                    Copy Backup Disk Image or CD/DVD to Tape

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

[TOP]                                             [Entry Fields]
  INPUT DEVICE OPTIONS:
  Input Device or file name                       /dev/cd0

  OUTPUT DEVICE OPTIONS:
  Output hostname of server
  Output Device or Directory                       /dev/rmt0
  Output device buffer size (in Kbytes)           [64]
  Compress data before writing to output media?   no
  Report output type                              progress indicator
  Use Existing Bootimage?                         no
  Platform/kernel type for tape boot image        [chrp/MP]
  Network install support to include              []
  Rewind tape before starting copy?               yes
  Forward to End of Tape before starting copy?    no
  [MORE]


F1=Help          F2=Refresh        F3=Cancel        F4=List
Esc+5=Reset      F6=Command        F7=Edit          F8=Image
F9=Shell         F10=Exit          Enter=Do
```

Figure 166. The Copy Backup Disk Image or CD/DVD to Tape Menu

The fields have the following meaning:

Input Device or file name
Specify the local directory path or device name where the backup file images exist. For example: /dev/cd1 or /backup_images/ SB.hostname.date.TOC.

Output hostname of server
Specify the hostname of the system which contains the tape drive or virtual device specified by the **Output device or Directory** field.

Output device or directory
Specify the name of the tape drive or virtual device that will be the output of this operation. For example: /dev/rmt0.

Output device buffer size (in Kbytes)
Specify the buffer size to use when storing data to the output device. The default is 64k. The buffer size indicates the amount of data that is written to the output device in a single output operation. Using a buffer size that best optimizes a particular device can have significant performance advantages.

Note: The larger the buffer size, the more memory will be used by the system during the operation.

Compress data before writing to output media?
Specifying this option will cause the data to be compressed by this system prior to writing to the backup device. You should not compress data if the device you are writing to has built-in compression capability, unless you are writing the backup to a remote host and wish to send less data over the network.

Note: Compressing the backup using software and device compression may cause the data to actually grow in size, as well as, to corrupt it.

Report output type

Specify whether to display a progress indicator during the copy process or to display errors only.

Use Existing Boot image?

Specify whether to use the existing boot image on the tape such as when transferring this backup image to a SysBack "Boot Only" tape. This may only be used with Full System backups.

Note: This option should be set to "no" when you are also specifying **Forward to End of Tape before starting copy?** to "yes".

Platform/kernel type for tape boot image

Specify the kernel and platform type to use when creating the boot image. Valid kernel options are: **mp** for multiprocessor or **up** for uniprocessor. Valid platform options are: **rspc**, **rs6k**, and**chrp**. The option chosen should match the kernel and platform type of the system that will boot from this backup tape. The default is the kernel and platform type of the machine initiating this process.

Note: This may only be used with Full System backups.

Network install support to include

Specify the type of network adapter support that should be included in the boot image. This would be utilized in situations where you boot from this tape but may install from an image or tape located on a remote machine on the network. Valid options are: **ethernet**, **token-ring**, or **FDDI**.

Note: This may only be used with Full System backups.

Rewind tape before starting copy?

Specify whether to rewind the output device before starting the process. Use this option when you have manually positioned the tape at the end of a backup sequence, or when you want to overwrite any data already on the tape.

Forward to End of Tape before starting copy?

Specify whether to forward to the end of the last image on the output device before beginning this operation. This option would be used to stack multiple backups on to a single tape for example.

Eject tape at end of backup?

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0   "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1   "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero, or with soft errors and a return code of one.

2   "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

Eject all write protected tapes

Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

Device name for remote volume prompt
Specify this option when backing up to a remote or local server to indicate the name of a terminal device on which to display volume prompt messages for multivolume operations.

3. Once you have entered your selections, press the Enter key to begin the process.

Copy Backup Tape to Backup Disk Image

To copy a backup image stored in a tape to a disk image file, use the **Copy Backup from Tape to Disk Image** menu.

Note: These utilities do not support backups stored in a Tivoli Storage Manager server, or using a Tivoli Storage Manager server as the output device.

1. Select the tape or virtual device where the backup is stored.
2. Select directory to use as the output device.

You will be presented with the following menu:

```
          Copy Backup Tape or Virtual Device to Backup Disk Image

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

[TOP]                                          [Entry Fields]
  INPUT DEVICE OPTIONS:
  Input Device or file name                    /dev/rmt0
  Backup Sequence Number                       []
  Rewind tape before starting copy?            yes

  OUTPUT DEVICE OPTIONS:
  Output hostname of server
  Output Device or Directory                   /usr/lpp/sysback/imag>
  Output device buffer size (in Kbytes)        [64]
  Compress data before writing to output media?  no
  Report output type                           progress indicator
  Backup file ID                               [03261329]
  Dynamically Created Backup file ID           no
  Overwrite existing backup with same ID?      no
  CD/DVD media Size                            []

  Device name for remote volume prompt         []
[BOTTOM]

F1=Help           F2=Refresh        F3=Cancel          F4=List
Esc+5=Reset       F6=Command        F7=Edit            F8=Image
F9=Shell          F10=Exit          Enter=Do
```

Figure 167. The Copy Backup Tape or Virtual Device to Backup Disk Image Menu

The fields have the following meaning:

Input device or file name

Specify the locally attached tape drive or virtual device name where the backup file images exist. For example: /dev/rmt0.

Backup Sequence Number

Specify the backup image to position to on the input device before beginning the process. For example, if you had 3 backups stacked on to the same tape, and you would like to copy backup 2 to the output device, specify "2" in this field.

Rewind tape before starting copy?

Specify whether to rewind the input device before starting the process.

Output hostname of server

Specify the hostname of the system which contains the tape drive or virtual device specified by the **Output device or Directory** field.

Output device or Directory

Specify the directory name that will be the output of this operation. For example: /backup_copies.

Output device buffer size (in Kbytes)

Specify the buffer size to use when storing data to the output device. The default is 64k. The buffer size indicates the amount of data that is written to the output device in a single output operation. Using a buffer size that best optimizes a particular device can have significant performance advantages.

Note: The larger the buffer size, the more memory will be used by the system during the operation.

Compress data before writing to output media?

Specifying this option will cause the data to be compressed by this system prior to writing to the backup device. You should not compress data if the device you are writing to has built-in compression capability, unless you are writing the backup to a remote host and wish to send less data over the network.

Note: Compressing the backup using software and device compression may cause the data to actually grow in size, as well as, to corrupt it.

Report output type

Specify whether to display a progress indicator during the copy process or to only display errors if encountered.

Backup file ID

A backup file ID is used to create a unique file name when writing a backup to a disk file. The default ID contains the current date and time. You may change this field to any value you desire to describe the backup. If you choose an ID already in use in the specified directory, you must also choose to "Overwrite existing backup with same ID" option or the backup transfer will fail.

Dynamically Create Backup file ID

This option may be used instead of combining the "Backup File ID" and "Overwrite existing backup with same ID?"options to generate a dynamically created backup file ID based on the date and time of the command's execution.

Overwrite existing backup with same ID?
If the specified "Backup file ID" is already used to name a backup in the specified directory, and you are not using the "Dynamically Create Backup file ID" option, you must use this flag to allow the prior backup to be overwritten. Otherwise, you must choose another unique ID or the backup transfer process will not continue.

CD/DVD media Size
Specifying a size value will format this backup image to file in such a manner as to burn it to CD or DVD at a later time. Specify the media size in MB. If the size of your media is double sided, only specify the size of one side of the media, not the total aggregate.

Device name for remote volume prompt
Specify this option when backing up to a remote or local server to indicate the name of a terminal device on which to display volume prompt messages for multivolume operations.

3. Once you have entered your selections, press the Enter key to begin the process.

If you would like to copy a backup from tape to CD/DVD, simply complete this process first to transfer the backup to a disk image file. Then, you may use the SysBack Backup to CD/DVD feature to burn the existing backup image to disk. To learn more about the Backup to CD/DVD options and their meaning, please refer to Chapter 5, "Backups to CD or DVD," on page 69.

Copy Backup Tape to Backup Tape

To copy a backup image stored in a tape to a another tape, use the **Copy Backup from Tape to Backup Tape** menu.

Note: These utilities do not support backups stored in a Tivoli Storage Manager server, or using a Tivoli Storage Manager server as the output device.

1. Select the tape or virtual device where the backup is stored.
2. Select the tape or virtual device to use as the output device to be presented with the following menu:

```
                     Copy Backup Tape to Backup Tape

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

[TOP]                                           [Entry Fields]
  INPUT DEVICE OPTIONS:
  Input Device or file name                     /dev/rmt0
  Backup Sequence Number                        []
  Rewind tape before starting copy?             yes

  OUTPUT DEVICE OPTIONS:
  Output hostname of server
  Output Device or Directory                    /dev/rmt1
  Output device buffer size (in Kbytes)         [64]
  Compress data before writing to output media? no
  Report output type                            progress indicator
  Use Existing Bootimage?                       no
  Platform/kernel type for tape boot image      [chrp/MP]
  Network install support to include            []
  Rewind tape before starting copy?             yes
  Forward to End of Tape before starting copy?  no
  [MORE]


F1=Help           F2=Refresh        F3=Cancel           F4=List
Esc+5=Reset       F6=Command        F7=Edit             F8=Image
F9=Shell          F10=Exit          Enter=Do
```

Figure 168. The Copy Backup Tape to Backup Tape Menu

The fields have the following meanings:

Input Device or file name
> Specify the locally attached tape or virtual device name where the backup file images exist. For example: /dev/rmt0.

Backup Sequence Number
> Specify the backup image to position to on the input device before beginning the process. For example, if you had 3 backups stacked on to the same tape, and you would like to copy backup 2 to the output device, specify "2" in this field.

Rewind tape before starting copy?
> Specify whether to rewind the input device before starting the process. Use this option when you have manually positioned the tape at the end of a backup sequence.

Output hostname of server
> Specify the hostname of the system which contains the tape drive or virtual device specified by the **Output device or Directory** field.

Output Device or directory
> Specify the name of the tape drive or virtual device that will be the output of this operation. For example: /dev/rmt0.

Output device buffer size (in Kbytes)
> Specify the buffer size to use when storing data to the output device. The default is 64k. The buffer size indicates the amount of data that is written to the output device in a single output operation. Using a buffer size that best optimizes a particular device can have significant performance advantages.
>
> **Note:** The larger the buffer size, the more memory will be used by the system during the operation.

Compress data before writing to output media?
Specifying this option will cause the data to be compressed by this system prior to writing to the backup device. You should not compress data if the device you are writing to has built-in compression capability, unless you are writing the backup to a remote host and wish to send less data over the network.

Note: Compressing the backup using software and device compression may cause the data to actually grow in size, as well as, to corrupt it.

Report output type
Specify whether to display a progress indicator during the copy process or to only display errors if encountered.

Use existing Boot image?
Specify whether to use the existing boot image on the tape such as when transferring this backup image to a SysBack "Boot Only" tape. This may only be used with Full System backups.

Note: This option should be set to "no" when you are also specifying **Forward to End of Tape before starting copy?** to "yes".

Platform / kernel type for tape boot image
Specify the kernel and platform type to use when creating the boot image. Valid kernel options are: **mp** for multiprocessor or **up** for uniprocessor. Valid platform options are: **rspc**, **rs6k**, and **chrp**. The option chosen should match the kernel and platform type of the system that will boot from this backup tape. The default is the kernel and platform type of the machine initiating this process.

Note: This may only be used with Full System backups.

Network install support to include
Specify the type of network adapter support that should be included in the boot image. This would be utilized in situations where you boot from this tape but may install from an image or tape located on a remote machine on the network. Valid options are: **ethernet**, **token-ring**, or **FDDI**.

Note: This may only be used with Full System backups.

Rewind tape before starting copy?
Specify whether to rewind the output device before starting the process. Use this option when you have manually positioned the tape at the end of a backup sequence, or when you want to overwrite any data already on the tape.

Forward to End of Tape before starting copy?
Specify whether to forward to the end of the last image on the output device before beginning this operation. This option would be used to stack multiple backups on to a single tape for example.

Eject tape at end of backup?
Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

| 1 | "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one. |
| 2 | "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions. |

Eject all write protected tapes
Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

Device name for remote volume prompt
Specify this option when backing up to a remote or local server to indicate the name of a terminal device on which to display volume prompt messages for multivolume operations.

3. Once you have entered your selections, press the Enter key to begin the process.

Chapter 20. Listing or Verifying Backups

This chapter describes the steps for listing or verifying the contents of a SysBack backup.

Listing Backup Contents

Use this option to list the contents of any SysBack backup. This option shows the header information for the backup, a list of the logical volumes or file systems included (except on file/directory backups), and optionally a complete list of files and directories on the backup. This does not actually read the backup image to ensure that the files are actually present. This process reads the table of contents that was created during the backup preprocessing stage.

To list the contents of a backup:

1. At a command line, type smit.
2. From the SMIT menu, select **System Backup & Recovery for AIX**.
3. Select **Backup & Recovery Options**.
4. Select **List Backup Contents**.

   Note: You can also access this menu using the fastpath. To do this, type smit sb_list at a command line.

5. On the Device Selector screen, highlight the device you want to use and press Enter.
6. The following screen is displayed. This screen shows the default options and values available when you list the contents of a backup to a local tape drive.

```
                         List Backup Contents


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                             [Entry Fields]
  Hostname of server                         hambone.austin.ibm.com
  Device or file name                        /dev/rmt0
  Backup sequence number                     [1]
  Display file list?                         yes                    +












  F1=Help          F2=Refresh       F3=Cancel        F4=List
  F5=Reset         F6=Command       F7=Edit          F8=Image
  F9=Shell         F10=Exit         Enter=Do
```

Figure 169. Default Options and Values Available When Listing the Contents of a Backup from a Local Tape Drive

The fields have the following definitions:

Hostname of server   The server hostname if a server option was

selected on the prior device selector screen. You cannot change this field.

Device name The device, if a tape drive or virtual device was selected. You cannot change this field from this screen.

Backup sequence number Default=1. If the multiple backups were performed sequentially to the device, select the sequence number of the backup to list files for. This field is displayed only when you are listing the contents of a backup from a tape drive or virtual device.

Display file list? Default=yes. To display the list of files on the backup in addition to the backup header information, select "yes." You can press Tab to change the value to "no." This field has no affect when you are listing the contents of a logical volume backup, because this backup does not contain individual files.

7. Press Enter when all fields are correct.

The system begins reading the tape. If you selected a backup sequence number other than "1," the tape first forwards past the prior backups before reading the backup information. The contents of the backup are displayed, along with a list of logical volumes and file systems, and the optional list of files and directories on the backup.

The following is an example list of the backup header and images (file systems and logical volumes) information:

```
Backup Header
-------------
Date:   Sun Mar 9 13:48:02 1997
User:   root
Host:   sbclient
Type:   TOC - Volume Group
Data:   vg00
Size:   33 megabytes
Packed: N
Buffer: 64 Kbytes
Bkend: B
Volume: 1

Images contained on this backup:
Image VG name        LV Name         Size   Mount Point
----- -------------- -------------- ----- ----------------
1      vg00           lv02               1   /testfsnew
2      vg00           rawlv2            24   -
3      vg00           rawlv3             8   -
```

The list above indicates that this is a volume group backup of the vg00 volume group and includes "raw" logical volumes rawlv2 and rawlv3 and the /testfsnew file system.

Verifying Files on System Backup

It is often a good idea to verify all of the data on a backup to ensure that the backup was written properly. For backups containing multiple data options, such as multiple volume groups or multiple file systems, you can verify all or part of the backup. For instance, if you created a system backup containing multiple volume groups, you can verify one volume group, multiple volume groups, or all volume groups on the backup. Likewise, for a logical volume backup containing multiple logical volumes, you can verify one or more logical volumes. This process actually reads the backup images and may provide a list of files that are actually contained on the backup media. You may use this listing to compare to the table of contents listing creating by executing section "Listing Backup Contents" on page 313 to determine if discrepancies exist.

To verify data on a backup:

1. From the Backup & Recovery Options menu, select **Verify a Backup**.

   Note: From a command line, type `smit sb_verify`.

2. On the Device Selector screen, highlight the device you want to use and press Enter.

3. If you selected a tape drive or virtual device, enter the backup sequence number. The default value is "1," indicating that the backup to be verified is the first backup on the media. If you stacked multiple sequential backups on the media and want to verify a different backup, type the backup number and press Enter.

4. Next, the backup is read to determine the backup type. If the backup is not a file or directory backup, you are asked to select the data to be verified. A list of verify options appear, dependent on the backup type. For instance, if this is a volume group backup, the list includes volume groups to verify. If this is a file system backup, the list includes file systems. To select a single option to verify, highlight the option and press Enter. To select multiple options, highlight each line and press F7. When all selections have been made, press Enter to continue.

5. The following screen shows the default options and values that appear when you verify the contents of a volume group backup of vg00 from a local tape drive:

```
                          Verify a Backup

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                [Entry Fields]
  Hostname of server                            hambone.austin.ibm.com
  Device name                                   /dev/rmt0
  Verify data type                              Volume_Group
  Report output type                            both                    +
  Device name for remote volume prompt          []
  Data to verify (of above type)                [rootvg]




  F1=Help            F2=Refresh         F3=Cancel          F4=List
  F5=Reset           F6=Command         F7=Edit            F8=Image
  F9=Shell           F10=Exit           Enter=Do
```

Figure 170. Default Options and Values Available When Verifying the Contents of a Volume Group Backup

The fields have the following definitions:

Hostname of server
The server hostname if a server option was selected on the prior device selector screen. You cannot change this field.

Device name
The device, if a tape drive or virtual device was selected. You cannot change this field from this screen.

Disk image file
The name of the disk image file previously selected. This field is displayed only if a disk image file name was selected. You cannot be change this field from this screen.

Verify Data Type
The backup type. It indicates the type of data, as shown in the **Data to verify** field, that is to be verified. This field is for information only and cannot be changed.

Report output type
Default=progress indicator. Keep the default value if you want to display a progress indicator during the backup process, which indicates the approximate total backup time and amount completed. Press Tab to select "file list" to display a list of files as they are being backed up, or Tab once more to show "only errors" that occur during the backup.

Device name for remote volume prompt
Default=(Blank/None). Enter a TTY, LFT or PTS device name to send the volume prompt to a specified device rather than to the current SMIT screen. If you are backing up to a remote host, the device name you specify is attached to the remote host. This field is displayed when the backup device is a tape drive or virtual device.

Examples of device names are /dev/tty0, /dev/lft0 and /dev/pts/5. You can determine the terminal device name by typing `tty` at the command line on that device.

Data to verify (of above type) Unless the backup is a file/directory Backup, this field contains the data to verify as selected on the prior screen. This can be a list of volume groups, file system, or logical volumes, depending on the type of backup to be verified. For a file/directory backup, this field is left blank and any contents are ignored, because the entire contents of the backup must be verified.

6. Press Enter when all fields are correct.

Each data type specified is read in its entirety to ensure the data is readable on the media. Either a list of files or progress indicator is displayed during the verification as selected above.

Chapter 21. Logging

SysBack provides three types of logging to help you monitor your backup and restore operations. The tree types are:

- Completion Status Logging
- Automatic Backup and Restore Process Logging
- Activity Logging

Each of the three types are described in greater detail throughout this chapter.

How to Access the Logging Menus

Use the following steps to access the SysBack Logging Options menu.

1. Log in as the root user.
2. From the SysBack **Main Menu**, select **Utilities**.
3. From the **Utilities** menu, select **Logging Options**.

   Note: You can access the same menu with the SMIT fastpath `smitty sb_logging`

Completion Status Logging

The SysBack Completion Status log file provides a mechanism to track the completion status of backup, restore, and verify operations. The log can be used in conjunction with the progress indicator, one or more file list options, and any of the logging options to monitor the ongoing status of backup, restore, and verify operations.

The Complete Status log provides the following information:

- the command initiated
- the date and time that the command started
- the final overall success or failure message
- the date and time the command ended
- the overall process status described as "SUCCESS", "WARNING", or "FAILURE"

The success or failure message listed is the last message to be generated by the overall process. If the process ends with a "WARNING" or "FAILURE" status, further investigation of the processing output is required. A "WARNING" status indicates that an error was encountered but that the error was not significant enough to stop the overall backup or restore process. Conditions that generate this condition are usually harmless. However, they do still require further evaluation to ensure that there is not a bigger, hidden problem.

The SysBack log, implemented in a fixed size and in a circular manner, never grows beyond a specified size. This is called a "head and tail" log. As the log file grows, the head of the log approaches the tail as if it were a circle. When the head catches the tail, the log has reached its maximum size and the oldest entries in the log are purged to make room for new entries. The length of time that SysBack log entries are held is directly related to the maximum size of the log. Increasing the log size enables the storage of entries for a longer period of time, chronologically.

You can change the default log size and location, and also list the log entries.

Changing the Attributes for Completion Status Log

The SysBack log file (sysback.log) is located, by default, in the **/var/adm/ras/** directory. You can change this location, as well as the log size. The default, and minimum size, is 4096 bytes (aka 4 kilobytes).

You can increase the log size in increments of 4 KB, provided that there is sufficient space in the log's destination directory. If you specify to increase the log size to a number that is not a 4 KB increment, the log size is automatically set to the next largest multiple of 4 KB. For example, if you specify a size of 4098, the size will be automatically set to 8192, because 4098 is not a multiple of 4 KB.

To change or show the SysBack Completion Status logging attributes:

1. Log in as the root user
2. Type `smitty sysback` and press Enter.
3. Select **Utilities** and press Enter.
4. From the SysBack **Logging Options** menu, select the **Completion Logging Options** menu.

   Note: You can access the same menu with the SMIT fastpath `smitty sb_CompLogging`

5. From the **Completion Logging Options** menu, select **Change/Show Attributes of the Completion Log**.

   The following screen will display:

```
         Change/Show Attributes of the Completion Log

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                              [Entry fields]
Sysback Log Filename          [/var/adm/ras/sysback.log]
Sysback Log Size              [8192]
```

Figure 171. The Change/Show Attributes of the Completion Log Screen

The fields have the following definitions:

Log Filename (Required)
> Specifies the fully-qualified path for the log location. The default location is **/var/adm/ras/sysback.log**.

> **Note:** Renaming the log file does not remove the previous log name from the file system.

Log Size (Required)
> Specifies the size, in 4096 bytes (4 Kilobytes) increments, of the log. The default size is 4096.

Displaying the Completion Status Log

You can display the contents of the Completion Status log using menu options or via command. To display the log via menu options, you would complete the following steps:

1. From the SysBack **Logging Options** menu, select the **Completion Logging Options** menu.

> **Note:** You can access the same menu with the SMIT fastpath `smitty sb_CompLogging`

2. From the **Completion Logging Options** menu, select the **Display Completion Log** option.

The following is an example of the output from a SysBack Completion Status log:

```
============ ALOG /var/adm/ras/sysback.log output ===========


Command: /usr/sbin/mkdirback -f/usr/lpp/sysback/bf/local/all -I06261530
-x -p /home/user/sample.txt
Date: Mon Jun 26 15:31:13 CDT 2004
File "/home/user/sample.txt" does not exist or is not readable.

FAILURE: Files or Directory backup failed to complete.


Command: /usr/sbin/mkdirback -f/usr/lpp/sysback/bf/local/all -I06261534 -x
-p /home/user/.profile
Date: Mon Jun26 15:34:48 CDT 2004
Backup up files'/home/user/.profile'
 Start date is Mon Jun 26 15:34:49 CDT 2004
 User is root at
 Estimated size is 1 MB

SUCCESS: File/Directory backup completed successfully.

=========== ALOG /var/adm/ras/sysback.log output ===========
```

The format of the log entry is described below:

Command
> The backup, restore, or verify command syntax executed.

Date The date and time that the backup, restore, or verify command syntax executed.

Error Information
> The last fatal error that caused an error in the backup, restore, or verify command.

Status Described as SUCCESS, WARNING or FAILURE, indicating that the operation completed or failed.

Automatic Backup and Restore Process Logging

Enabling the SysBack Automatic Backup and Restore Process Logging options can provide you with additional information that can be used when further evaluation of the overall processing output is required for problem diagnosis. This logging option will allow you to automatically capture the process output from the SysBack backup and restore commands initiated via the command line or via the SMIT interface. The process output will be stored in a directory on the local system that initiated the process. If you wish to manage all of the logs for all of your systems in a central location, you may simply define an NFS mounted directory as the output location.

When Automatic Logging is enabled, the process output is collected for the following processes:

- Full System (Installation Image) Backups
- Volume Group Backups
- Filesystem Backups

- Logical Volume Backups
- File or Directory Backups
- Any of the above types written to CD or DVD using the CD/DVD backup command
- Data restore processes initiated while the system is in normal mode.

There are two Automatic Logging options to configure. The first option is allows you to enable or disable the automatic logging of backup and restore process output and specify the output directory. The section option allows you to list or prune existing logs based on specified criteria.

Enabling and Disabling Automatic Logging

This section described how you can enable and disable Automatic Logging. By default, automatic logging will be disabled. If you would like to use this feature, you must explicitly enable it. Please be aware that enabling automatic logging will not preclude you from also viewing the information interactively. In cases where the process is started in the foreground, the process output will be written to the both the screen, and to the log files. However, when automatic logging is enabled, the "progress indicator" option for the backup and restore commands will be automatically disabled and ignored if the option is specified.

When you enable Automatic Logging, you will be required to designate a directory or file system name to be the repository of all backup and restore logs. The logs will be name in the following format: *type.hostname.date.time.txt* where: type is one of the following

- SB: when the process output is from the `sysback` command used by Full System (Installation Image) backups
- VG: when the process output is from the `mkvgback` command used by Volume Group backups
- FS: when the process output is from the `mkjfsback` command used by Filesystem backups
- LV: when the process output is from the `mklvback` command used by Logical Volume backups
- FD: when the process output is from the `mkdirback` command used by File or Directory backups
- SR: when the process output is from the `sysrestore` command used by the data restore process

and `hostname` is the name of the client system that initiating the backup process;

and `date` is in the form of MMDDYYYY;

and `time` is in the form of HHMM on a 24 hour clock.

If the location specified for the output logs should become full during an active process, the following will occur:
- the out of space condition for the log will be considered a non fatal error to the overall process
- a out of space related message will be issued to notify persons monitoring the process interactively
- the same out of space related message will be written to the Completion Status log

- the standard out and standard error streams that had previously been directed to the output file, will be written to /dev/null for the rest of that process
- the overall backup or restore process will exit with a return code of 1, aka a WARNING status, unless another more serious error that warrants a FAILURE status is encountered later in the process.

In order to enable Automatic Logging and specify the output directory, please execute the following steps.

1. Log in as the root user.
2. Type smitty sysback and press Enter.
3. Select **Utilities** and press Enter.
4. Select **Logging Options** and press Enter.
5. Select **Automatic Logging Options** and press Enter.
6. Select **Change/Set Automatic Logging Options** and press Enter.

> **Note:** You can access the same menu with the SMIT fastpath smitty sb_autoLoggingUpdate

The following screen will display:

Figure 172. The Change/Set Automatic Logging Options Screen

```
Change/Set Automatic Logging Options

Move cursor to desired item and press Enter.

  Automatic Logging    Enabled
  Store Logs in     /data



F1=Help            F2=Refresh          F3=Cancel            F8=Image
F9=Shell           F10=Exit            Enter=Do
```
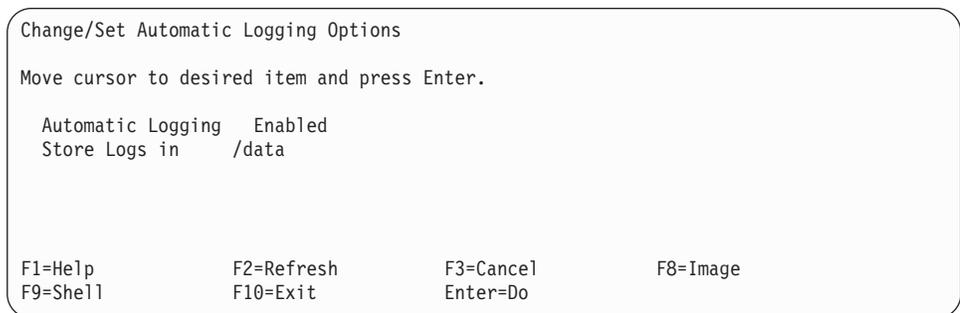
The fields have the following definitions:

Automatic Logging
> Use this option to specify whether to enable or disable automatic logging. Use of this option also requires that a value be specified for the **Store Logs in** field.

Store Logs in
> Use this option to specify the location where the logs should be stored. The entry may either be a file system mount point or a directory name.

7. After making the desired selections, press Enter to commit the changes.

If you would like to display the currently enabled options for Automatic Logging, please execute the following steps.

1. Log in as the root user.
2. Type smitty sysback and press Enter.
3. Select **Utilities** and press Enter.
4. Select **Logging Options** and press Enter.
5. Select **Automatic Logging Options** and press Enter.
6. Select **List Current Automatic Logging Options** and press Enter.

Output similar to the following will display:

Figure 173. The Change/Set Automatic Logging Options Menu

```
   COMMAND STATUS:

Automatic Logging is:   Enabled
Logs will be stored in:  /data



F1=Help             F2=Refresh          F3=Cancel           F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Listing and Pruning Log Files Generated by Automatic Logging

SysBack provides options for listing and pruning the output logs when automatic logging is enabled. In order to list, prune, or display the list of output logs generated by Automatic Logging, please execute the following steps.

1. Log in as the root user.
2. Type smitty sysback and press Enter.
3. Select **Utilities** and press Enter.
4. Select **Logging Options** and press Enter.
5. Select **Automatic Logging Options** and press Enter.
6. Select **List, Display and Prune Log Options** and press Enter.

   Note: You can access the same menu with the SMIT fastpath smitty sb_autoLogPrune

The following menu will display:

Figure 174. The List, Display and prune Log Options Menu

```
List, Display, Prune Log Options

Move cursor to desired item and press Enter.

  Logs Stored in directory   Enabled
  Action          LIST
  Log Type             []
  For Host             []
  For Month (MM format)     []
  For Time (HHMM format)    []
  For Day (DD format)     []
  For Year (YYYY format)    []
  Older than # of Days    []



F1=Help             F2=Refresh          F3=Cancel           F8=Image
F9=Shell            F10=Exit            Enter=Do
```

The fields have the following definitions:

Logs Stored In Directory
> Use this option to specify the directory location to be pruned or listed with this task.

Note: Since it is possible to define multiple locations to store output processing logs, this option allows you to specify any directory path to list or prune even when it is not the directory specified for automatic logging on this system. For example: This system may have several NFS exported directories that allow multiple systems to store their output logs on this local system.

Action

Use this option to specify whether to list, display, or prune the logs in the specified directory. The choices are:

List   Use this option to list logs that meet the specified criteria

Display
Use this option to display the contents of the logs that meet the specified criteria

Prune   Use this option to remove logs that meet the specified criteria

Log Type

Use this option to specify whether to list, display, or prune the logs in the specified directory. The choices are:

ALL   Use this option to list, display, or prune all of the logs that meet the specified criteria, regardless of type.

System
Use this option to list, display, or prune the Full System (Installation Image) Backup logs that meet the specified criteria.

Volume Group
Use this option to list, display, or prune the Volume Group Backup logs that meet the specified criteria.

Filesystem
Use this option to list, display, or prune the File System Backup logs that meet the specified criteria.

Logical Volume
Use this option to list, display, or prune the Logical Volume Backup logs that meet the specified criteria.

File & Directory
Use this option to list, display, or prune the File or Directory Backup logs that meet the specified criteria.

Restore
Use this option to list, display, or prune the data restore process logs that meet the specified criteria.

For Host

Use this option to specify the hostname of the system that initiated the process that created the log.

For Month (MM format)

Use this option to narrow the log criteria to a specific month. The format of this field is MM (01-12) where 1 = January and 12 = December.

For Time (HHMM format)

Use this option to narrow the log criteria to a specific time. The format of this field is HHMM based on a 24 hour clock.

> **For Day (DD format)**
>> Use this option to narrow the log criteria to a specific day. The format of this field is DD (1-31).
>
> **For Year (YYYY format)**
>> Use this option to narrow the log criteria to a specific year. The format of this field is YYYY.
>
> **Older Than # of Days**
>> Use this option to perform the specified action against all logs older than the value specified in this field.
>
> 7. After making the desired selections, press Enter.

Activity Logging

SysBack Activity Logging provides an additional level of process information to use when monitoring your environment or performing problem source identification tasks. The Activity Log will automatically capture data from the backup and restore processes and will be stored in a directory on the local system that initiated the process. If you wish to manage all of the logs for all of your systems in a central location, you may simply define an NFS mounted directory as the output location.

The SysBack log, implemented in a fixed size and in a circular manner, never grows beyond a specified size. This is called a "head and tail" log. As the log file grows, the head of the log approaches the tail as if it were a circle. When the head catches the tail, the log has reached its maximum size and the oldest entries in the log are purged to make room for new entries. The length of time that SysBack log entries are held is directly related to the maximum size of the log. Increasing the log size enables the storage of entries for a longer period of time, chronologically.

Format of Activity Log Entries

An Activity Log entry could have any of the following information depending on the process that was executed:

- the backup or restore type
- the time that the backup or restore process started
- the name of the local host that is executing the backup or restore command
- the name of the host that initiated the backup or restore command
- the name of the host where the data was sent or read
- the time that a tape change request was made
- the time that a tape change request was completed
- the time that the backup or restore process ended
- the number of volumes used when the process is utilizing a tape, CD, or DVD device

Below is an example of an Activity log entry:

```
============ ALOG /var/adm/ras/sysback.log output ===========

Backup Type:  System Backup
Local Hostname: sysback5
Initiator Host: sysback1
Data Destination Server:  sysback.dfw.ibm.com
Backup Start Time:  Fri Jun 29 11:38:41 CDT 2007
Tape Change Request at Fri Jun 29 12:08:32 CDT 2007
Tape Changed at Fri Jun 29 12:10:32 CDT 2007
```

```
                 Tape Change Request at Fri Jun 29 13:08:32 CDT 2007
                 Tape Changed at Fri Jun 29 13:10:32 CDT 2007
                 Backup Completed at Fri Jun 29 14:08:23 CDT 2007
                 Number of Volumes 3
                 =========== ALOG /var/adm/ras/sysbackactlog.log output ===========
```

Changing/Showing the Activity Log Attributes

The SysBack Activity log file (sbactlog.log) is located, by default, in the **/var/adm/ras/** directory. You can change this location, as well as the log size. The default, and minimum size, is 8192 bytes (aka 8 kilobytes).

You can increase the log size in increments of 4 KB, provided that there is sufficient space in the log's destination directory. If you specify to increase the log size to a number that is not a 4 KB increment, the log size is automatically set to the next largest multiple of 4 KB. For example, if you specify a size of 8193, the size will be automatically set to 12288, because 8193 is not a multiple of 4 KB.

To change or show the SysBack Activity Log attributes:

1. Log in as the root user.
2. Type `smitty sysback` and press Enter.
3. Select **Utilities** and press Enter.
4. From the SysBack **Logging Options** menu, select the **Activity Logging Options** menu.

   Note: You can access the same menu with the SMIT fastpath `smitty sb_ActLogging`

5. From the **Activity Logging Options** menu, select **Change/Show Attributes of the Activity Log**

   The following screen will be displayed:.

```
            Change/Show Attributes of the Activity Log

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                              [Entry fields]
Sysback Log Filename          [/var/adm/ras/sbactlog.log]
Sysback Log Size              [8192]
```

Figure 175. The Change/Show Attributes of the Activity Log Screen

The fields have the following definitions:

Log Filename (Required)
> Specifies the fully-qualified path for the log location. The default location is **/var/adm/ras/sbactlog.log**.
>
> **Note:** Renaming the log file does not remove the previous log name from the file system.

Log Size (Required)
> Specifies the size, in 4096 bytes (4 KB) increments, of the log. The default size is 8192.

Displaying the Activity Log Content

You can display the contents of the Activity Log using menu options or via command. To display the log via menu options, you would complete the following steps:

1. From the SysBack **Logging Options** menu, select the **Activity Logging Options** menu.

   Note: You can access the same menu with the SMIT fastpath `smitty sb_ActLogging`

2. From the **Activity Logging Options** menu, select the **Display Log** option.

The following is an example of the output from a SysBack Activity Status log:

```
============ ALOG /var/adm/ras/sysback.log output ===========

Backup Type:  System Backup
Local Hostname: sysback5
Initiator Host: sysback1
Data Destination Server:  sysback.dfw.ibm.com
Backup Start Time:  Fri Jun 29 11:38:41 CDT 2007
Tape Change Request at Fri Jun 29 12:08:32 CDT 2007
Tape Changed at Fri Jun 29 12:10:32 CDT 2007
Tape Change Request at Fri Jun 29 13:08:32 CDT 2007
Tape Changed at Fri Jun 29 13:10:32 CDT 2007
Backup Completed at Fri Jun 29 14:08:23 CDT 2007
Number of Volumes 3
=========== ALOG /var/adm/ras/sysbackactlog.log output ===========
```

Chapter 22. Scheduled Backups and Scripts

The SysBack Scripts and Scheduling functions provide a mechanism to automate common backup functions that require little or no user interaction. The SysBack Scripts functions help you build command syntax into a Korn Shell script that can be scheduled with SysBack. The SysBack Scheduling functions enable you to take these scripts and schedule them to run automatically at a specified time or interval. The Scheduling functions act as a frontend to `crontab` and enables you to add, update, and remove SysBack backup scripts to `crontab`.

Scripts

Accessing the Backup Scripts Menu

The Backup Scripts menus enable you to create, change, or remove backup scripts.

To access the Backup Scripts menus:

1. From the **SysBack Main Menu**, select **Backup Schedules and Scripts**.

   Note: At a command line, type `smitty sb_script_sched`.

2. Select the **Backup Scripts** option.

   Note: At a command line, type `smitty sb_script`.

Creating a Backup Script File

When you create the backup script file, the SMIT options with which you are presented give the appearance that a backup will be performed. These options are only used to create the backup command sequence, and not to start a backup.

The scripts created with the **Create a Backup Script File** option are stored in the **/usr/lpp/sysback/sbscripts** directory unless a fully qualified path name is specified in the script name field.

```
                    Create a Backup Script File


  Move cursor to desired item and press Enter.


  Create a System Backup Script
  Create a Volume Group Backup Script
  Create a Filesystem Backup Script
  Create a Logical Volume Backup Script
  Create a File/Directory Backup Script
  Create a Backup to CD/DVD Script

F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 176. Create a Backup Script File Menu Options

To create a backup script file:

1. From the **Backup Scripts Menu**, select **Create a Backup Script**.

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Note: At a command line, type `smitty sb_script_c`.

2. Select the type of backup script you want to create. The following choices are available:

   - **Create a System Backup Script**
   - **Create a Volume Group Backup Script**
   - **Create a Filesystem Backup Script**
   - **Create a Logical Volume Backup Script**
   - **Create a File/Directory Backup Script**
   - **Create a CD/DVD Script**

   Note: For this example, **Create a System Backup Script** is used.

3. On the Device Selector screen, highlight the device you want to use and press Enter.

4. The following screen is displayed.
   The first few options are described below. The other options are identical to the

```
                    Create a System Backup Script

  Type or select values in entry fields.
  Press Enter AFTER making all desired changes.

  [TOP]
Backup Script Name                       [system_backup]
Description                              [System Backup]
Overwrite Existing Script                No
Save Backup Output to a Log?             No
Location of Log File                     []
Overwrite Previous Log?                  No
HOSTNAME of server
Device Name                              [/dev/rmt0]
Create a Power Backup?                   No
Report output type                       File List
Platform/kernel type for tape boot image rspc/MP
Network install support to include
Compress data before writing to media?   No
User Description                         []
Buffer size (in Kbytes)                  [64]
Preserve Physical partition mapping?     No
Device name for remote volume prompt     []


F1=Help            F2=Refresh         F3=Cancel          F4=List
F5=Reset           F6=Command         F7=Edit            F8=Image
F9=Shell           F10=Exit           Enter=Do
```

Figure 177. The Create a System Backup Script Menu

options available when you create a system backup. For descriptions of those options, see the instructions for creating system backups in Chapter 4, "Performing Backups," on page 19.

The first six options have the following definitions:

Backup Script Name (Required)
>The fully-qualified filename for the backup script. If a directory is not specified, the script is created in the **/usr/lpp/sysback/sbscripts** directory by default.

Description (Optional)
>The purpose or content of the script. If no description is provided, the description reflects the type of backup performed by the script.

>You can use any character or number, except for single (') or double (") quotation marks.

Overwrite Existing Script (Optional)
> Determines whether or not to overwrite an existing backup script. The default is "No"

Save Backup Output to a Log?
> Indicates to save backup output to a log by redirecting `stdout` and `stderr`.

Location of Log File
> Specify the fully qualified path and filename to be used as the backup log file. If this option is not specified when the **Save Backup Output to a Log?** option is set to `yes`, this value will be defaulted such that the log filename created is based on the date and time that the backup is run. If a file is automatically created by SysBack, it will be created in the directory:**/usr/lpp/sysback/log** and will be in the form of: `sysback$(date "+%m%d%H%M")`
>
> where the variable string will be expanded to the current date and time when the file is created.

Overwrite Previous Log?
> Specify this option to overwrite a previously created log filename. For example: Perhaps you have MON, TUE, WED, THU, and FRI backup logs/scripts. Each Monday, you would like for the existing MON script to overwrite the MON log from the previous week. This option will execute this action.

5. Press Enter to confirm your selections.

The following file is an example of a backup script generated using the options specified above.

```
#!/bin/ksh
# Command filename: /usr/lpp/sysback/scripts/system_backup
# Description: System Backup

sysback -v -f /dev/rmt0 -T rspc -k mp

exit $?
```

Note: The commands contained in the backup script file are not checked for validity. Always verify the validity of the backup script by performing a backup using the same options as those in the backup script.

Changing a Backup Script File

Use the **Change a Backup Script File** option to edit the contents of a backup script created by SysBack. You can add additional commands or change the existing commands and options.

The **Change a Backup Script File** option uses the AIX vi editor and provides help screens and pre-programmed function keys. However, you can edit the script file with any text editor.

To change a backup script file:

1. From the **Backup Scripts Menu**, select **Change a Backup Script File**.

   Note: At a command line, type `smitty sb_script_change`.

2. Select the script file you want to edit and press Enter.

3. The following vi help screen is displayed. This screen lists the actions you can perform, as well as the corresponding function key or key sequences.

```
                 EDITOR HELP SCREEN

You are about to enter the "vi" editor. If your terminal type
provides function keys, the following function keys may be used
for editing the file. The standard "vi" commands shown may also
be used if function keys are not provided.

FUNCT KEY        ACTION                  STANDARD VI KEY
----------       --------                ----------------
  F1             Display this help screen     :e#
  F2             Exit without saving changes  :q!
  F3             Save changes and exit        :wq!
  F4             Page Back                    CTRL-B
  F5             Page Forward                 CTRL-F
  F6             Begin/End Insert Mode        i/ESC
  F7             Insert Line (F6 to quit)     o/ESC
  F8             Delete Character             x
  F9             Delete Line                  dd


        === Press F1 or ":e#" to edit file ===
```

Figure 178. The vi Editor Help Screen

Notes:

a. Press F1 at any time to return to the help screen.

b. Press F2 at any time to exit the editor without saving the changes.

4. Press F1 to exit the help screen and begin editing the file.

Removing a Backup Script File

Use the **Remove a Backup Script File** option to remove existing SysBack script files.

To remove a backup script file:

1. From the **Backup Scripts Menu**, select **Remove a Backup Script File**.

   Note: At a command line, type smitty sb_script_remove.

2. Select the script file you want to edit and press Enter.

3. Press Enter to confirm the removal of the script file.

Accessing the Backup Schedules Menus

The Backup Schedules menus enable you to create, update, list, and remove backup schedules.

To access the backup schedules menus:

1. From the **SysBack Main Menu**, select **Backup Schedules and Scripts**.

   Note: At a command line, type smitty sb_script_sched.

2. Select the **Backup Schedules** option.

   Note: At a command line, type smitty sb_sched.

Creating a Backup Schedule

Use the **Create a Backup Schedule** option to schedule an existing backup script. This script can be one created by SysBack or a user-defined script.

The **Create a Backup Schedule** option provides a front end to the AIX **crontab** and features a menu-based method for creating a schedule.

To create a backup schedule:

1. From the **Backup Schedules Menu**, select **Create a Backup Schedule**.

   Note: At a command line, type smitty sb_sched_c.

2. The following screen is displayed:
   The fields have the following definitions:

```
                        Create a Backup Schedule

Type or select values in entry fields
Press Enter AFTER making all desired changes.


  Script Name                  [/usr/lpp/sysback/scripts/system_backup
  Schedule ID
  Schedule Description         [Friday and Wednesday Full System Backup}
  Minute (0-59)                [0]
  Hour (0-23)                  [23]
  Day (1-31)                   []
  Month (1-12)                 []
  Week Day (0-6)               [3,5]



F1=Help      F2=Refresh    F3=Cancel     F4=List
F5=Reset     F6=Command    F7=Edit       F8=Image
F9=Shell     F10=Exit      Enter=Do
```

Figure 179. The Create a Backup Schedule Menu

Script Name (Required)
> The name of an existing script file. Press F4 for a list of script files or type the fully qualified path and file of the script file you want to use.

Schedule ID (No Input)
> The Schedule ID is generated at command execution and is related to the schedule. You cannot enter any information in this field.

Schedule Description (Optional)
> A description of the backup schedule. You can enter any text except single (') or double (") quotation marks.

Minute (Required)
> Specifies the starting minute, a number between 0 and 59. Press F4 for a list of valid values.

Hour (Required)
> Specifies the starting hour, in military time. Use a number between 0 and 23, where 0 equals 12:00 AM and 23 equals 11:00 PM.

Day (optional)
> Specifies the day of the month, a number between 1 and 31. Press F4 for a list of valid values. If both this field and the WeekDay field are left blank, the schedule runs every day.

Month (optional)

Specifies the starting month, a number between 1 and 12. Press F4 for a list of valid values. If this field is left blank, the schedule runs every month.

WeekDay (optional)

Specifies the day of the week, a number between 0 and 6, where 0 equals Sunday. Press F4 for a list of valid values. If both this field and the Day field are left blank, the schedule runs every day.

Important Field Input Notes:

a. Two numbers separated with a dash indicate an inclusive range. For example, to schedule a command to run Tuesday through Friday, type "2-5" in the **WeekDay** field.

b. Numbers separated with commas indicate that the schedule should run on separate days. For example, to run a schedule on the first and last days of January, type "1" in the **Month** field and "1,31" in the **Day** field.

3. Press Enter to commit the selections.

Note: Do not make changes to the schedule through manual manipulation of **crontab**. Because SysBack acts as a front end to **crontab**, making changes manually causes the SysBack scheduling features and **crontab** to be out of sync.

Updating a Backup Schedule

To update an existing backup schedule that was created by SysBack:

1. From the **Backup Schedules Menu**, select **Update a Backup Schedule**.

   Note: At a command line, type `smitty sb_sched_u`.

2. Select the schedule you want to update and press Enter.

3. The following screen is displayed:
   For descriptions of the above options, see the section "Creating a Backup

```
    Change or Update an Existing Backup Schedule


Type or select values in entry fields
Press Enter AFTER making all desired changes.


  Script Name              [/usr/lpp/sysback/scripts/system_backup]
  Schedule ID              SB1
  Schedule Description     [Friday and Wednesday Full System Backup]
  Minute (0-59)            [0]
  Hour (0-23)              [23]
  Day (1-31)               []
  Month (1-12)             []
  Week Day (0-6)           [3,5]


F1=Help      F2=Refresh    F3=Cancel     F4=List
F5=Reset     F6=Command    F7=Edit       F8=Image
F9=Shell     F10=Exit      Enter=Do
```

Figure 180. The Change or Update an Existing Backup Schedule Menu

Schedule" on page 333.

4. Press Enter to commit the changes.

Listing Backup Schedules

To list existing backup schedules created by SysBack, select **List Backup Schedules** from the **Backup Schedules** menu.

Note: From a command line, type `smitty sb_sched_l`.
The following is an example of the output produced.

```
Command: /usr/lpp/sysback/sbscripts/file.lasher.2
ID: SB1
Description: Sample Test Schedule for host lasher
Execution Time:
--------------
Every: 15th in the month(s) of June at 9:25 a.m.


---------------------------
```

Removing a Backup Schedule

To remove an existing backup schedule:

1. From the **Backup Schedules Menu**, select **Remove a Backup Schedule**.

   Note: At a command line, type `smitty sb_sched_r`.
2. Select the schedule you want to remove and press Enter.
3. Press Enter again to confirm the removal of the backup schedule.

Note: Removing the backup schedule in this manner removes the schedule from SysBack, as well as its corresponding entry in **crontab**.

Chapter 23. Virtual Devices

A virtual device enables you to logically group multiple physical devices into a single "virtual" device for easier reference. For example, if you want to use three tape drives in parallel to perform your backups, you can configure those drives into a virtual device description. Therefore, each time you want to backup or restore from those parallel devices, you need to specify only the virtual device name.

Note that any tape drive can be configured into one or more virtual devices. For instance, the same tape drive used in a list of sequential virtual devices can also be used in a list of parallel virtual devices.

Note: When configuring multiple physical devices into a single virtual device, you can use tape drives of different types. The only limitation is that all drives must be configured to the same block size. When you use a parallel or multi-copy virtual device, the speed of the backup is limited to the speed of the slowest device.

To access the SysBack menus for managing the virtual devices:

1. At a command line, type `smit`.
2. Select **System Backup & Recovery for AIX**.
3. Select **Configuration Options**.
4. Select **Virtual Devices**.

You can also access these menus using the fastpath. To do this, type `smit sb_virdev` at a command line.

```
                        Virtual Devices

Move cursor to desired item and press Enter.

  Add a Virtual Device
  List Virtual Devices
  Remove a Virtual Device

















 F1=Help            F2=Refresh          F3=Cancel           F8=Image
 F9=Shell           F10=Exit            Enter=Do
```
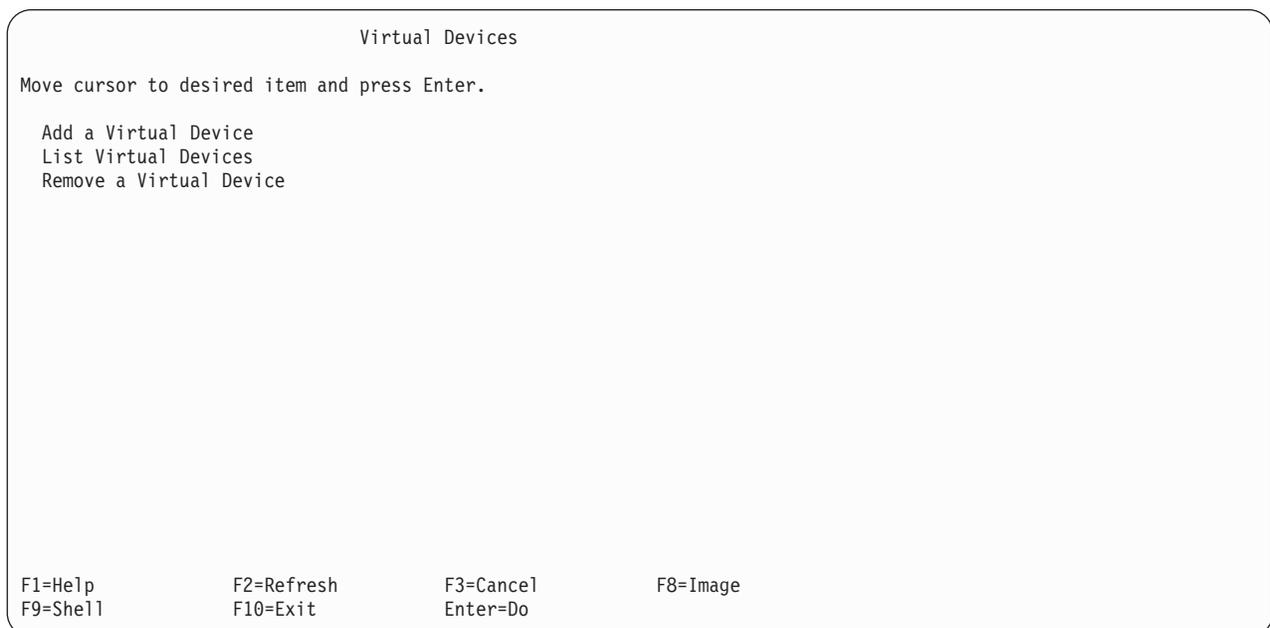
Figure 181. The Virtual Devices Menu

Types of Virtual Devices

SysBack uses the following types of virtual devices:

Sequential   A group of devices that are used sequentially, meaning that when one device reaches its capacity, the backup or restore automatically continues on the next device in the list. You can have up to eight sequential devices in the list. When the last device in the list reaches its capacity, the user is prompted to change the media in all of the devices before the backup can continue.

Parallel   A group of devices that are used in parallel. In this case, the data is "striped" across all of the drives in the list, meaning that the first cluster of data is written to the first drive, the second to the next drive, and so forth. The writes are optimized to keep as many drives as possible streaming at all times for best performance.

Although you can back up in parallel to eight drives at a time, using more than three drives often exceeds the read performance of the disk drive you are reading from. After you have exceeded the read performance during a backup, there is no benefit to having additional parallel devices. In fact, when the write performance exceeds the read performance, tape drives might no longer continue streaming and might enter a "start-stop" mode, decreasing the write performance even more. Finding the optimal number of parallel devices to use for your backups is a matter of trial and error. If performance decreases after adding an additional device to the parallel virtual device, you have likely exceeded the read performance of your disk drive or file system.

> **Note:** Always keep in mind when using parallel devices that you must have the same number of devices available in order to list or restore the files from the backup.

Multi-Copy   A group of devices that each receive an identical copy of the data being backed up. Unlike parallel devices, this virtual device type results in identical copies of the same data. This is useful for creating multiple backups at one time, either for replicating systems or for both onsite and offsite storage of backup tapes. Multi-copy backups often take little more time than a single backup, because only one copy of the data is being read. Performance has been optimized to enable several devices to be written to without decreasing performance. Again, finding the optimal number of devices without severely impacting overall backup performance is a matter of trial and error.

Note that each copy created using a multi-copy virtual device is equivalent to a single sequential backup. Therefore, each of the backups created with the multi-copy virtual device can only be read independently using a single tape device name or a sequential virtual device name.

Volume Numbering

When a device reaches the end of the media, the volume number is changed and a new volume header is written to the next volume. How the volume number is incremented differs from one virtual device type to another:

Sequential   The volume number is always incremented by one. When the first

device reaches the end of media, the backup continues on the next device (volume two). When the last device in the list reaches the end of volume, the user is prompted to change the volume in *all* of the drives before the backup can continue. It is necessary to change volumes in all drives even if only one of the drives will be used before the backup completes.

Parallel The volume number of the first drive begins with A1, the second drive, B1, and the third, C1. When any of the drives reaches end of volume, the second digit is incremented by one. For instance, if the second drive (B) reaches the end of volume, the next volume inserted in that drive will be B2. In this way, it is easy to determine which tapes belong with which drives and in what order.

Multi-Copy The volume number in each drive always starts at one, and each is always incremented by one. Since the same data is written to all drives, all volume numbers will also be the same. Note, however, that all drives might not reach end of volume at the same time. Therefore, the only difference between the backups in each drive might be the amount of data on each volume.

Autoloaders

You can define any of the virtual device types as a tape library (or "autoloader"). By setting a virtual device to **autoloader/auto-eject**, any time a backup tape reaches end of media, the tape automatically ejects from the tape drive (if the tape drive supports auto-eject). If the tape drive has an autoloader device, the autoloader senses that the tape has been ejected and automatically removes the tape cartridge and inserts the next available cartridge. When SysBack senses a new cartridge has been inserted, the backup continues automatically.

Note that the autoloader is defined for use in sequential mode only. Most autoloaders support sequential insertion of the tape cartridges. SysBack does not support random insertion of backup cartridges, but ejects the cartridge and waits for the autoloader to insert the next sequential cartridge.

You can use multiple autoloaders in conjunction with any of the virtual device types described above. Also, some autoloaders have multiple tape drives. When you use two drives in the same autoloader, the loader must be able to monitor both drives simultaneously and change the tapes in both drives as needed.

Adding a Virtual Device

Creating a virtual device is a matter of selecting one or more physical devices and selecting the type of virtual device to define.

To create a new virtual device:

1. From the Virtual Devices menu, select **Add a Virtual Device**.

   Note: From a command line, type `smit sb_mkvirdev`.
   The following screen is displayed:

```
                        Add a Virtual Device


Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                            [Entry Fields]
* Write Policy                               Sequential          +
  Description                                []
  Auto-loader/Auto-eject?                    no                  +
* Device name(s)                             [/dev/rmt0 /dev/rmt1]  +










F1=Help          F2=Refresh        F3=Cancel        F4=List
F5=Reset         F6=Command        F7=Edit          F8=Image
F9=Shell         F10=Exit          Enter=Do
```
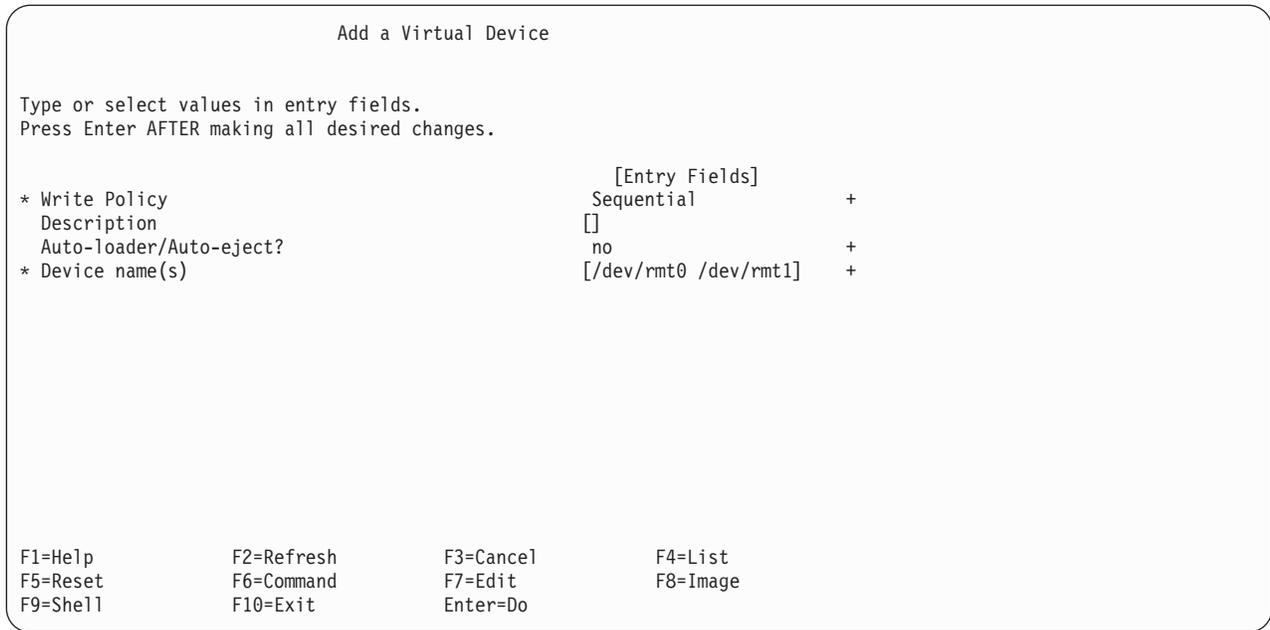
Figure 182. The Add a Virtual Device Menu

2. You can change the following fields from the screen above:

    Write policy
    > Default=Sequential. Press Tab to select either "Parallel" or "Multi-copy" write policy. You can also press F4 to list the three options and select from the list.

    Description
    > Default=Blank. Although this field is left blank at this time, a generic description is provided if you do not enter a description. The default description depends on the write policy:

    > | | |
    > |---|---|
    > | **Sequential** | Sequential Virtual Device |
    > | **Parallel** | Parallel Virtual Device |
    > | **Multi-copy** | Multi-copy Virtual Device |

    > Enter a description to override the description above. You do not need to include the physical device name in the description. Do not use single (') or double (") quotation marks in this field.

    Autoloader/Auto-eject?
    > Default=no. Press Tab for "yes" if this device, or these devices, are autoloaders. If you set this field to autoloader, the user does not receive prompts to change the volumes.

    Device name(s)
    > Default=Blank. Enter the device names to include in the list (preceded by /dev), or press F4 to list the available tape drives and select the drives using F7. If this device is an autoloader, you can enter only one device name.

    > If the write-policy is set to Parallel or Multi-copy, you must enter more than one device name in this field. If the write-policy is sequential, entering only one device name treats this device no differently than a single tape drive, unless you also indicate that the device is an autoloader.

3. Press Enter to create the virtual device.

The new virtual device name is generated and displayed on the screen. Repeat the above steps for each additional virtual device you want to add.

Listing Virtual Devices

To list all of the virtual devices currently defined, select **List Virtual Devices** from the Virtual Devices menu.

This list shows the virtual device name, whether the virtual device is configured as an autoloader or auto-eject device, the write policy (s=sequential, p=parallel, c=multi-copy), the virtual device description, and a list of the physical devices that make up the virtual device.

Removing a Virtual Device

To remove a virtual device:
1. From the Virtual Devices menu, select **Remove a Virtual Device**.

   Note: From a command line, type `smit sb_remexclude`.
2. Enter the virtual device name to delete or press F4 to list the available virtual devices and select from the list.
3. Press Enter to delete the specified virtual device.

Chapter 24. Tape Drives

This chapter contains information on performing various functions on tape drives. For virtual devices, some functions can be performed for all physical tape drives defined for the virtual device. Most of these tape drive options can be performed from other AIX system administration SMIT menus, but are provided within SysBack.

To access the tape drive menus:

1. At a command line, type smit.
2. From the SMIT menu, select **System Backup & Recovery for AIX**.
3. Select **Tape Drive Options**.

```
                           Tape Drives

Move cursor to desired item and press Enter.

  List All Defined Tape Drives
  Configure a Defined Tape Drive
  Unconfigure an Available Tape Drive
  Change Tape Drive Characteristics
  Unload/Eject Tape from Drive






  F1=Help            F2=Refresh         F3=Cancel          F8=Image
  F9=Shell           F10=Exit           Enter=Do
```
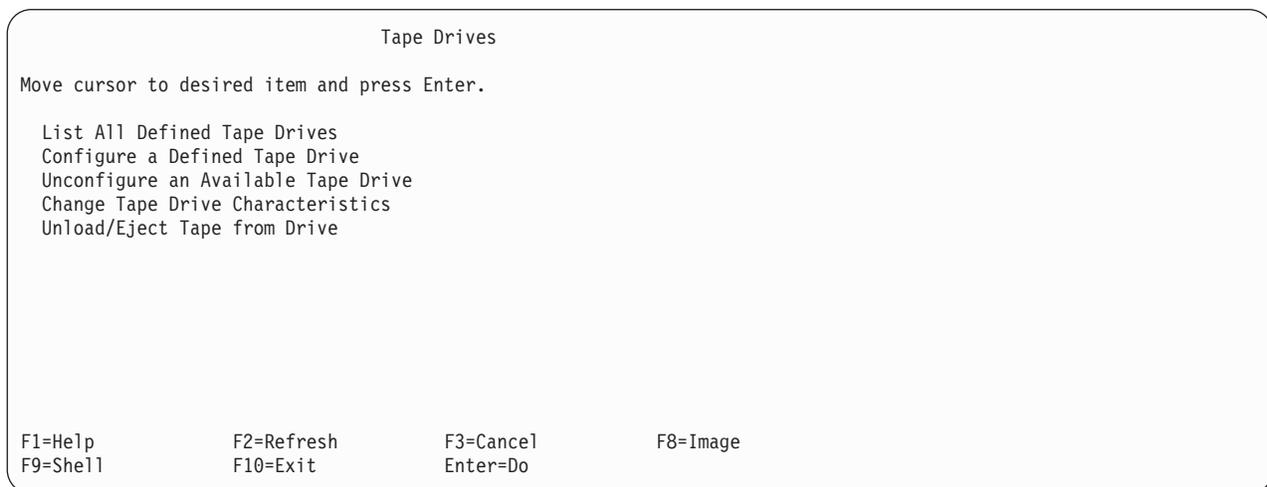
Figure 183. The Tape Drives menu

Listing tape drives

To list all tape drives defined to the system, whether currently available or not, select **List All Defined Tape Drives** from the Tape Drive Options menu.

The list includes all drives defined or available on the system. Only physical tape drives, and not virtual devices, are displayed. The drives labelled "Defined" have at one time been detected by the system but are currently unavailable, either because they are turned off, disconnected, or the **Unconfigure an Available Tape Drive** option was used against them. Devices labelled "Available" are available to use.

Configuring a defined tape drive

When a tape drive is either just turned on, reattached, or previously made unavailable, use this option to make the drive available for use.

To configure a defined tape drive:

1. From the Tape Drive Options menu, select **Configure a Defined Tape Drive**.

2. From the list of defined tape drives, select the drive you want to configure and press Enter.

If an error occurs, then the system is unable to detect the drive that it had previously defined. Make sure the tape drive is turned on and properly connected.

Unconfiguring an Available Tape Drive

You can make a tape drive unavailable for use by the system but still retain its definition in the system. To make a drive unavailable for use:

1. From the Tape Drive Options menu, select **Unconfigure a Defined Tape Drive**.
2. From the list of available tape drives, select the drive you want to unconfigure and press Enter.

Changing Tape Drive Characteristics

The characteristics of a tape drive that you can change differ from one drive type to another. One characteristic that is common to all drives is the **block size**. Refer to your tape drive documentation or the SMIT HELP screen (F1) for information on additional characteristics that can be changed.

To change the block size of a tape drive:

1. From the Tape Drive Options menu, select **Change Tape Drive Characteristics**.
2. From the list of available tape drives, select the drive whose characteristics you want to change.
3. A screen similar to the following is displayed:

```
              Change / Show Characteristics of a Tape Drive

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                              [Entry Fields]
  Tape Drive                                  rmt0
  Tape Drive type                             8mm5gb
  Tape Drive interface                        scsi
  Description                                  5.0 GB 8mm Tape Drive
  Status                                       Available
  Location                                     04-C0-00-5,0
  Parent adapter                               scsi0
  Connection address                           5,0
  BLOCK size (0=variable length)              [1024]                    +#
  Use DEVICE BUFFERS during writes             yes                      +
  RETURN error on tape change or reset         no                       +
  Use EXTENDED file marks                      yes                      +
  DENSITY setting #1                           140                      +
  DENSITY setting #2                           20                       +
  Use data COMPRESSION                         yes                      +


F1=Help           F2=Refresh        F3=Cancel          F4=List
F5=Reset          F6=Command        F7=Edit            F8=Image
F9=Shell          F10=Exit          Enter=Do
```

Figure 184. The Change/Show Characteristics of a Tape Drive menu

Depending on the type of tape drive, the options might differ from those above.

To change the block size, enter a new block size in the **BLOCK size (0=variable length)** field or press F4 for a list of valid entries.

Different tape drives might provide multiple block sizes for reading or writing the data. Use the same block size to read a tape that used to originally write the tape. It is generally more efficient to write tapes using larger block sizes (such as 1024, 2048) because this will usually increase the speed at which the data is written to the tape. It also usually increases the capacity of the tape because fewer "inter-block gaps" are needed between blocks written.

Notes:

a. Only the root user has permission to change the block size of a tape drive.

b. When you create a system backup, the tape block size is temporarily changed to 512-bytes, because the installation process that reads that tape is only capable of reading the tape at 512-byte blocks.

Refer to Appendix E, "Device and System-Specific Information," on page 493 for information on recommended tape drive characteristics.

4. Press Enter to change the tape drive characteristics.

Unloading or Ejecting a Tape from the Drive

You can rewind and eject the tape cartridge from either a local or remote tape drive or virtual device, assuming the device supports auto-eject. If you select a virtual device, the tape is ejected from all physical devices defined for the virtual device. Whether the drive supports auto-eject or not, the drive door must be closed again (or opened and closed) before the drive can be used again.

To eject the tape from a drive or virtual device:

1. From the Tape Drive Options menu, **select Unload/Eject Tape from Drive**.

2. From the list of tape drives and virtual devices available to both the local and remote systems, select the device you want to eject and press Enter.

Chapter 25. Collecting SysBack and System Environment Information

This chapter describes how to collect detailed environment information for your system and the SysBack product. This information may be used to diagnose a variety of possible problems that you might encounter. Most often, this information would be collected at the direction of your technical support specialist who will use this command to collect the relevant data needed to aid in problem determination.

To collect SysBack environment and system information:

1. Log in as the root user.
2. From the SysBack **Main Menu**, select **Debug Options**.

   Note: You can access the same menu with the SMIT fastpath `smitty sb_DebugConfig`

3. Select the **Collect SysBack Environment and System Information** menu and press Enter to continue.

   The following screen is displayed:

Figure 185. The Collect SysBack Environment and System Information Screen

```
          Collect SysBack Environment and System Information

Move cursor to desired item and press Enter.

 Directory name        []
 Archive data (tar format)    no
 Compress archive image (using AIX archive command) no

 Gather all data       no

 SysBack and System Information
 ------------------------------
 SysBack logs        no
 SysBack control files     no
 Software levels       no
 Device information      no
 LVM information       no
 Filesystem information     no
 General information      no
 Network information      no
 TSM integration information   no
F1=Help              F2=Refresh          F3=Cancel           F4=List
F5=Reset             F6=Command          F7=Edit             F8=Image
F9=Shell             F10=Exit            Enter=Do
```

The fields have the following definitions:

Directory Name

Use this option to specify the directory that will store all of the collected data files. The default directory is /tmp/sbenvsup.

Archive data (tar format)

Use this option to compress the data files collected using the AIX compress command. This option must be used in combination with the **Compress archive image** option.

Compress archive image (using AIX archive command)
Use this option to specify whether to archive all of the data files collected by the process using the AIX tar format. The archive filename will be named like `sbenvsup.mmddyyyy.tar` and will be stored in the directory name specified in the **Directory Name** field.

Gather all data
Use this option to indicate that this process should collect all of the logs, files, and command output available by this process. If this option is set to "yes", it is not necessary to specify "yes" to any of the following options as they will be automatically collected by the process.

SysBack Logs
This option will collect defined SysBack logs. The information collected by this option is:

- The Completion Status Tracking log
- The Activity Log
- Logs created by the Automatic Logging feature
- Install logs named like `/tmp/debug.mmddyyyy.out`
- The contents of the `/tmp/sbdebug` directory

SysBack control files
This option will collect SysBack control files. The information collected by this option is:

- `ls -l /usr/lpp/sysback /usr/lpp/sysback/`
- **/usr/lpp/sysback/**
  - `.servers`
  - `.remote_access`
  - `.root_access`
  - `.autologs`
  - `.exclude_toc`

    Note: Shows the list of excluded files from this table of contents file. If you have multiple exclude list files, then the `.exclude_toc` will have an entry which points to that `.exclude_list` filename. Those exclude lists would be collected as well.

- `.exclude_list`
- `.settings`
- `.local_access`
- **sbscripts**
- `.serverfirewallopts`
- `.clientfirewallopts`
- **scripts**
  - `fsback.pre`
  - `fsback.post`
  - `install.pre`
  - `install.postroot`
  - the Post First Boot Install Script, if defined
  - `install.post`
- `ls -l /usr/lpp/sysback/scripts`

Software levels

This option will collect AIX and software levels. The information collected by this option is:

- The SysBack level
- The AIX level via the `oslevel` command
- `uname -v`
- `uname -r`
- `instfix -k`
- All software levels via the output of `lslpp -h`

Device information

This option will collect device information. The information collected by this option is the output of the following AIX commands:

- `lsdev -C`
- `lsdev -P`
- `lscfg -pv`
- `ls -l /dev`

LVM information

This option will collect LVM information. The information collected by this option is the output of the following AIX commands:

- `lsvg`
- `lsvg vgname`
- `lsvg -p`
- `lsvg -l`
- `lsattr -El hdisk#`
- `lqueryvg -Atp vgname`
- `lslv lvname`
- `lspv`
- `lspv -p`
- `lqueryvg -Atp -p /dev/hdisk#`

Filesystem information

This option will collect file system information. The information collected by this option is the output of the following AIX commands:

- `df -k`
- `mount`
- `lsfs -l lsvg | xargs lsvg -l`

General information

This option will collect general information from the operating system relevant to some SysBack operations. The information collected by this option is:

- `/etc/passwd`
- `/etc/group`
- `bootinfo -z`
- `bootinfo -p`
- `bootinfo -y`
- `bootinfo -k`
- `env /etc/inittab`

Network information

This option will collect network related information relevant to SysBack operations. The information collected by this option is:

- The output of the `hostname` command
- `/etc/hosts`
- `/etc/netsvc.conf`
- `/etc/exports`
- `exportfs`
- the contents of the **/tftp** directory
- `/etc/bootptab`
- `no -a`
- `netstat -rn`
- `lssrc -g nfs`

TSM integration information

This option will collect information related to the TSM integration function. The information collected by this option is:

- The `sbtsmerror.log`
- ` echo DSMI_LOG`

  Note: Collect log from this output if `env` environment variable is set.
- `/usr/lpp/sysback/dsm.opt.tsm*`
- `/usr/lpp/sysback/dsm.sys`
- `/usr/lpp/sysback/dsm.opt`

Appendix A. Commands

This appendix details the usage of SysBack commands.

cfglocaccess

Purpose

Adds, lists, or removes local user access to backup devices and directories.

Syntax

```
►►──cfglocaccess──┬──-l─────────────────────────────────────────────────────►◄
                  └──-u──"user"──┬──-r──────────────────────┐
                                 └──┬──-d──"user"─────────┐ │
                                    ├──-f──"device"──────┤ │
                                    ├──-b──"directory"───┤
                                    └──-l──"directory"───┘
```
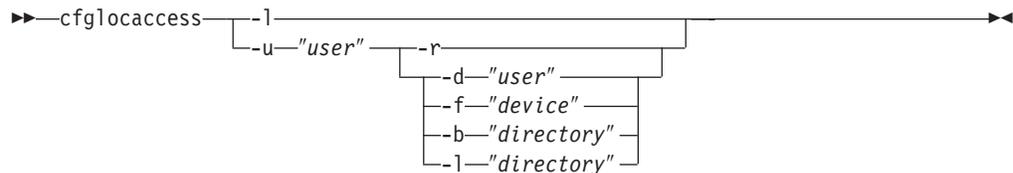
Description

All users on the system are provided access to all of the backup devices on the
system when SysBack is first installed. This is accomplished by providing a
permission record for a user called *all*. You might not want certain users to have
access to all devices and backup directories, so you can deny specific users access
or change the device or directory list that specific users are allowed to use. The
devices and directories specified when using this option determine the list of
backup options that users receive when they perform backups using SMIT, and
those devices or directories that other SysBack commands, executed at the
command line, are permitted to read or write to.

If you do not want all users on the system to have the same access, remove access
to user *all*, using the **-r** flag, before setting up access to specific users.

SysBack provides flexibility in assigning users access to devices, directories, and so
on. For instance, you can assign specific devices or directories to each user on the
system or assign a device to all users on the system except specific users. Refer to
"Adding or Changing Local User Device/Directory Access" on page 122 for details
and examples of user permissions.

Flags

-b "directory"
  Specifies one or more directories, separated by spaces, to which the user can
  perform regular backups. The user can back up to any subdirectory in the
  directories provided here. When performing any SysBack backup, the user has
  a disk image file backup option for each directory specified.

-d "user"
  Specifies users, separated by spaces, that are to be explicitly denied access. If
  you use this flag when you are adding or changing a permission record for *all*
  users, all users *except* those specified will be permitted.

-l Lists current user permissions.

-f "device"
  Specifies a list of tape drives or virtual devices, separated by spaces, to which
  the user or users can perform backups. Only the devices entered here are
  displayed on the SMIT menus when the user selects a backup.

-i "directory"
Specifies one or more directories, separated by spaces, to which the user can perform *network installation image* backups. This field applies only to the root user, because only the root user can create network installation image backups of volume groups. This flag applies only when you configure the root user or *all* users, if *root* is not specifically defined.

When backing up a volume group to use as a network installation image, the user has a disk image file backup option for each directory specified. Also, when this or other systems attempt to perform a network installation, all backup images in the specified directories that the client system has permission to read will be displayed as installation options.

-r Removes the specified user access record.

-u "user"
Specifies the user to be added, changed, or deleted.

Examples

1. To add user peter to the access list, providing access to local tape device */dev/rmt0*, virtual device *vdev0*, and the backup directory **/usr/lpp/sysback/bf/local/peter**, type:

```
cfglocaccess -u peter -d "/dev/rmt0 vdev0" -b \
    /usr/lpp/sysback/bf/local/peter
```

2. To allow *all* users, except users *marsha* and *jan*, access to *all* devices, type:

```
cfglocaccess -u all -d "marsha jan" -f all
```

3. To remove the access record for user *cindy* from the access list, type:

```
cfglocaccess -r -u cindy
```

4. To list current hosts allowed to access local backup device access, list:

```
cfglocaccess -l
```

Files

/usr/lpp/sysback/.local_access List of local users allowed or denied access to the backup devices and directories for all SysBack backups. The format of the data in this file is very specific and should not be edited manually.

Related Information

The **cfgremserver** command.

cfgremaccess

Purpose

Adds, lists, or removes remote host and user access to local backup devices and directories.

Syntax

```
►►──cfgremaccess──┬──-l─────────────────────────────────────────────────────┬──►◄
                  │                  ┌──-r──────────┐                        │
                  ├──-u──"user"──────┼──-d──"host"──────┤                    │
                  │                  ├──-D──"user"──────┤                    │
                  │                  ├──-f──"device"────┤                    │
                  │                  ├──-b──"directory"─┤                    │
                  │                  └──-l──"directory"─┘                    │
                  ├──-p──"ports"──────────────────────────────────────────┤
                  └──-P───────────────────────────────────────────────────┘
```
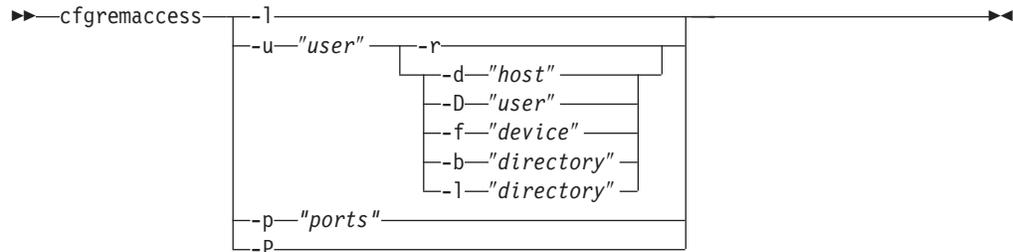
Description

Before any client host can perform a backup to a remote server, the server must enable permission to the client host and to the specific users on the client who will be performing the backup operations. The **cfgremaccess** command provides access to the specified hosts and users. To provide the remote host a list of valid devices and backup files on this server when executing backups from SMIT, you must also run the **cfgremserver** command on the client to identify this server.

Before using this command, you must have already configured this host for Remote Services using the **cfgremsvs** command. You must also run the **cfgremsvs** command on the client host before attempting to execute any backups to this server.

You can provide all hosts on the network access to the server by creating a single record that applies to all of the hosts by providing a permission record for a host called *all*. You can exclude or deny specific hosts by using the **-d** flag. You can also create an access record for specific hosts, to override the *all* record for that host only.

Likewise, if you want to deny access to most, but not all, users on a particular host, you can indicate a user name of *all*. You can then supply a list of specific users to deny with the **-D** flag. You can also create a permission record for a specific host and user, to override any records for *all* hosts or *all* users.

Refer to "Adding or Changing the List of Remote Backup Servers" on page 135 for a complete explanation of the permissions and example of their use.

Note: You can enter either the hostname or a full domain name, if any. If you are operating in a domain network, use the full domain name of the client host. Using only the host name in a domain network allows access to any host on the network with the given host name, even though they might be in different domains.

Flags

-b "directory"
Specifies one or more directories to which the client hostname and username can perform regular image file backups. The client can perform a backup to this directory or any of its subdirectories. A backup image file option for each directory supplied is displayed in SMIT when the user attempts to perform any backup, list, verify or restore operation.

-d "host"
Denies access to one or more specified hostnames. This flag is valid only when *all* is entered for the hostname (**-h**) parameter.

-f "device"
Specifies one or more devices to which the client hostname and username can perform regular image file backups. The entry can be a tape device (such as /dev/rmt0), virtual device (such as vdev0) or *all*, which allows the client to back up to any devices on this server. A device option for each device supplied is displayed in SMIT when the user attempts to perform any backup, list, verify, or restore operation. Also, these devices are listed when the client attempts to perform a network installation from this server.

–h "hostname"
Specifies the hostname of the client to add or remove. A hostname of *all* allows access to all hosts on the network. With a hostname of *all*, you can also enter hosts to exclude with the **-d** flag.

–i "directory"
Specifies one or more directories to which the client hostname and username can perform network installation image file backups. The client can perform a backup to this directory or any of its sub-directories. Any files in the directories supplied will be listed for the client when it attempts to perform a network installation operation.

-l　Lists all hosts currently configured, along with the devices and directories to which they have access. When this flag is specified, any other flags used will be ignored.

-u "username"
Specifies the username on the client to add or remove. To allow access to all users on the specified hostname, enter the username *all*.

-r　Removes the access record for the specified hostname and username. Removing the access record does not necessarily deny access to the client, because it might revert to access provided by another record.

-D "user"
Denies access to one or more specified user names. This flag is valid only when *all* is entered for the username (**-u**) parameter.

-p "ports"
Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this flag, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must to be specified in one of the following ways:
- As a comma separated list of ports. For example: 1670, 1671

> **Note:** You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.

- As a range of ports. For example: 1670-1700.

-P Specify this flag when you are modifying the information for the indicated host but do not want the previously configured firewall communication ports to be updated or removed.

Examples

1. To add user *peter* on client host *pluto* to the access list, providing access to local tape device */dev/rmt0*, virtual device *vdev0*, and the backup directory **/usr/lpp/sysback/bf/pluto/peter**, type:

   ```
   cfgremaccess -h pluto -u peter -d "/dev/rmt0 vdev0" -b \
           /usr/lpp/sysback/bf/pluto/peter
   ```

2. To allow *all* users on *all* hosts, except users *marsha* and *jan* on host *mars*, access to all devices, type:

   ```
   cfgremaccess -h all -d mars -u all -D "marsha jan" -f all
   ```

3. To remove the access record for user *cindy* on host *venus* from the access list, type:

   ```
   cfgremaccess -r -h venus -u cindy
   ```

4. To list current hosts allowed local backup device access, type:

   ```
   cfgremaccess -l
   ```

Files

/usr/lpp/sysback/.remote_access

> List of hosts and users allowed or denied access to the local backup devices and directories for all SysBack backups. The format of the data in this file is very specific and should not be edited manually.

Related Information

The **cfgremsvs** and **cfgremserver** commands.

cfgremrootaccess

Purpose

Adds, removes, or lists commands enables for Remote Command Access.

Syntax

```
►►──cfgremrootaccess──-h──"host"──────────────────────────────────►◄
                              ├──-d──"host"────┤
                              ├──-l────────────┤
                              ├──-c──"command"─┤
                              └──-r────────────┘
```

Description

The **cfgremrootaccess** command is used to configure a backup client to allow a
server to remotely initiate its backups. This is called a "pull backup." For example,
A server contacts a client to start the backup; in response the client initiates the
backup and sends the data to the server. Therefore, the server is actually "pulling"
the backup operation from the client.

Using pull backups enables you to centrally manage your backups by initiating
and controlling backup operations from a single location. You can further automate
this central management of backups using the SysBack Scheduling and Scripting
functions described in Chapter 22, "Scheduled Backups and Scripts," on page 329.

Pull backups require not only Remote Services Configuration, but also Remote
Command Access configuration. The Remote Services Configuration enables data
to be sent across the network to the backup server. The Remote Command Access
enables the server to initiate the pull backup.

Also note that the server that initiates the pull backup can be a different server
than where the data is sent. Because of this, Remote Services can be configured
between machine A, the client, and machine B, the backup server receiving the
backup, while Remote Command Access is configured between machine A, the
client, and machine C, the backup initiation server.

Flags

–c "command"
> Specifies the fully-qualified path and name of a command to allow for remote
> access. Used with the **-h** and **-r** flags.

–d"host"
> Specifies the hostname of a machine that is not allowed to contact the client to
> initiate a backup. Used only when the **-h** flag is set to "ALL". If you are
> specifying multiple hosts for which to grant access, you should enter them as a
> space separated list.

–h "host"
> Specifies the hostname of a machine that will initiate a backup of this client.
> This flag is required and must be used with the **-c** flag.

–l Lists all commands enabled for Remote Command Access.

–r Indicates to remove the command specified with the **-c** flag.

Examples

1. To allow the server sysback1.aix.dfw.ibm.com to contact this client to initiate a pull backup using the **/usr/sbin/sysback** command, type:

   ```
   cfgremrootaccess -c '/usr/sbin/sysback' -h 'sysback1.aix.dfw.ibm.com'
   ```

2. To list all commands that are enabled for Remote Command Access and their respective hosts, type:

   ```
   cfgremrootaccess -l
   ```

3. To remove the access for the **/usr/sbin/** command, to be remotely initiated, type:

   ```
   cfgremrootaccess -r -c '/usr/sbin/mkdirback'
   ```

Files

/usr/lpp/sysback/.root_access   Lists commands and respective hosts allowed Remote Command Access.

Related Information

The **cfgremsvs** command.

cfgremserver

Purpose

Defines, lists, or undefines servers the client can access.

Syntax

```
►►──cfgremserver──┬──-l──────────────────────────────────────────────────────►◄
                  └──-a──┬───-h──hostname──┬────────────┬──
                        └──-r──            ├──-p────────┤
                                           ├──-p──"ports"──┤
                                           └──-f────────┘
```
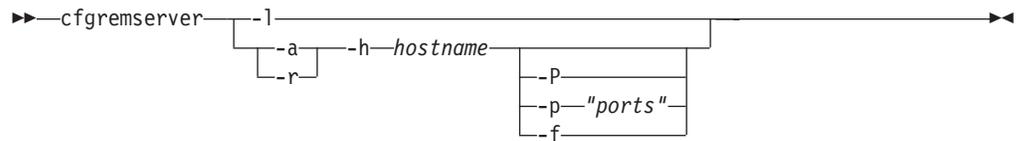
Description

The **cfgremserver** command is used to either define or undefine a remote host that is to act as a server for the local host. The local system can execute remote sysback commands without setting up the server with this command, but only devices on remote servers set up with this command will be listed when executing backup, list, verify or restore options from SMIT. This command can also be used to list currently defined remote servers.

Before this command can be used to define a server to the system, both the local host and the host to act as the backup server must be configured for Remote Services using the **cfgremsvs** command. In addition, before a client machine can add a remote server, that server must have already provided access to its devices or directories with the **cfgremaccess** command. When defining a new remote server, this command verifies that Remote Services is configured on both the client and server systems and the server has granted access to this client.

Flags

-a Adds the hostname to the list of remote servers.

-f Indicates whether or not remote disk image file backup options should be displayed from SMIT. Without this option, disk image file options are not listed as valid backup devices even if the server has enabled directory access to this client.

-h "hostname"
Hostname of host where the requested backup device is attached.

-l Lists defined servers. Searches each server in the list to obtain a list of all devices and directories accessible by this client.

-r Removes the hostname from the list of remote servers.

-p "ports"
Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this flag, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must to be specified in one of the following ways:
- As a comma separated list of ports. For example: 1670, 1671

Note: You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.

- As a range of ports. For example: 1670-1700.

-P Specify this flag when you are modifying the information for the indicated host but do not want the previously configured firewall communication ports to be updated or removed.

Examples

1. To add server venus to the list and provide backup options on *venus* for devices or disk image files, type:

   cfgremserver -a -h venus -f

2. To remove the server *venus* from the list of remote servers, type:

   cfgremserver -r -h venus

3. To list currently defined servers and the devices available on those servers, type:

   cfgremserver -l

Files

/usr/lpp/sysback/.servers   List of servers for which to list SMIT backup options

Related Information

The **cfgremsvs** and **chremaccess** commands.

cfgremsvs

Purpose

Configures Remote Services.

Syntax

```
►►──cfgremsvs──────────────────────────────────────────────────►◄
```

Description

This command is used to configure **Remote Backup Services** for either a host that is to act as a backup server for other machines or on a client that requires access to backup devices located on another backup server.

The command requires no arguments, and when executed, creates a new user ID "sbnet" in the *staff* group. This user ID is used to execute commands and transfer backup data using the **sbclient** command from the client to the server machine.

You need to run this command only once on each workstation.

Files

/etc/password	User password file
/etc/group	User group file
/usr/lpp/sysback/.remote_access	
	Access permissions for remote hosts

Related Information

The **sbclient** command.

cfgvirdev

Purpose

Adds, lists, or removes virtual device descriptions.

Syntax

```
►►──cfgvirdev──┬──-l─────────────────────────────────┬──────────────►◄
               │  ┌──-r──────────────────────────┐   │
               │  │  ┌──-s──┐                     ├──device──┘
               └──-a──┼──-p──┼──┬──-A──────────────┐
                      └──-c──┘  └──-d──"description"─┘
```
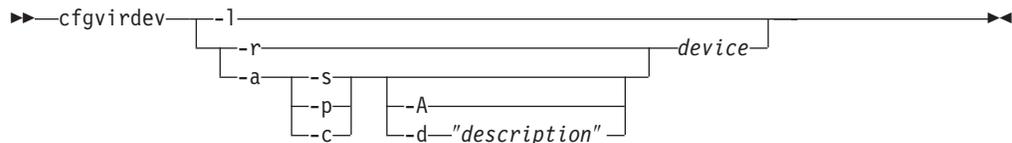
Description

The **cfgvirdev** command is used to add, list, or remove a virtual device description from the system. A virtual device can have a write policy of either **sequential**, **parallel** or **multi-copy**. Refer to Chapter 23, "Virtual Devices," on page 337 for a detailed description of each write policy.

You can also indicate that a sequential **autoloader** is attached to the virtual device. This indicates that when a tape reaches the end of media, it is ejected from the drive, and the reading or writing continues automatically as soon as the next volume is inserted. In this case, the user receives no prompt to change the volume.

If you are creating an autoloader virtual device, you can assign one or more physical devices. Otherwise, you must assign multiple physical devices. A device is a tape drive such as "/dev/rmt0".

You can assign your own description to the virtual device, or you can allow the system to provide a default description. By default, the description assigned will be either "Sequential Virtual Device", "Parallel Virtual Device" or "Multi-copy Virtual Device", depending on the write policy you choose.

When adding a new virtual device, the *device* option can be a single tape drive (such as "/dev/rmt0") or a list of tape drives (such as "/dev/rmt0 /dev/rmt1/dev/rmt2"). When removing a virtual device, the device option is the virtual device name to remove. Omit the *device* option when only listing defined virtual devices.

When adding a new virtual device, the system automatically assigns the next available virtual device name. The prefix will be *vdev*, followed by a device number, starting with 0 and increasing for each subsequent device added.

Flags

-a   Adds a new virtual device.

-r   Removes an existing virtual device.

-l   Lists defined virtual devices.

-s   When adding a virtual device, indicates a Sequential write-policy.

-p

When adding a virtual device, indicates a Parallel write-policy.

-c When adding a virtual device, indicates a Multi-copy write-policy.

-d "description"
The description of the virtual device. This description is displayed on the SMIT screens when listing available backup and restore devices. Enclose this description in double quotation marks.

-A
Indicates an autoloader is attached to the physical devices.

Examples

1. To create a sequential virtual device, using tape devices *rmt0* and *rmt1*, type:

   `cfgvirdev -as /dev/rmt0 /dev/rmt1`

2. To create a parallel virtual device using devices *rmt1* and *rmt2*, and assigning a user description, type:

   `cfgvirdev -apd "Parallel 8mm tapes" /dev/rmt1 /dev/rmt2`

3. To define *rmt0* as an auto-loader, type:

   `cfgvirdev -asd "Autoloader" /dev/rmt0`

4. To remove virtual device *vdev0*, type:

   `cfgvirdev -r vdev0`

chexcludelist

Purpose

Adds, removes, or lists files or directories in the exclude list file.

Syntax

```
►►──chexcludelist──┬──-l──────────────────┬──────────────────────────►◄
                   ├──-r──┬──"filename"──┬─┤
                   │      └──"@LVname"───┘ │
                   └──-a──┬──"filename"──┬─┘
                          └──"@LVname"───┘
```
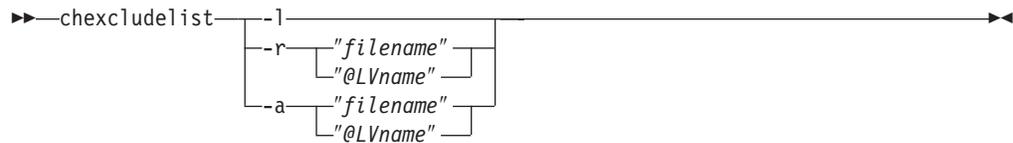
Description

The **chexcludelist** command is used to either add or delete entries from the exclude list file. The exclude list file contains directories, individual filenames, or logical volume names that are to be excluded from all backups created with the SysBack commands.

The file or directory name must begin with a slash (/) but can contain *wildcard* (*) characters. If you enter a filename, only that file is excluded. If you enter a directory name, all files and directories within the specified directory are excluded. When specifying wild cards, you must enclose the string in single quotation marks (') to preserve the special characters.

The following are examples of using wildcard in the exclude list:

/tmp	All files below the /tmp directory
/*test*	All files in the system containing the word "test".
/*old	All files on the system ending with "old".
/home/b*	All files under /home starting with a "b".
/home/t*y	All files under /home starting with "t" and ending with "y".

Note that any entry starting with "/*" will include all directories on the system, not just the root (/) directory.

Note: When excluding a logical volume name, type a "@" character before the logical volume name. This indicates that the entry is a logical volume and not a file or directory. You cannot use wild cards in logical volume names.

Flags

-l   Lists current entries. No changes are made to the existing exclude list.

-a "filename"
   Adds a filename or directory to the exclude list.

-r "filename"
   Removes a filename or directory from the exclude list.

Examples

1. To add the directory **/tmp** to the exclude list, type:

   ```
   chexcludelist -a /tmp
   ```

2. To exclude all files on the system ending with ".old", type:

   ```
   chexcludelist -a ©/*.old©
   ```

3. To exclude logical volume *userlv1* from volume group backups, type:

   ```
   chexcludelist -a @userlv1
   ```

4. To remove the file **/home/test** from the exclude list, type:

   ```
   chexcludelist -r /home/test
   ```

5. To list current excluded files and directories, type:

   ```
   chexcludelist -l
   ```

Files

/usr/lpp/sysback/.exclude_list   Filenames and directories to exclude from backups.

chimagefile

Purpose

Changes the permissions of an existing disk image backup file.

Syntax
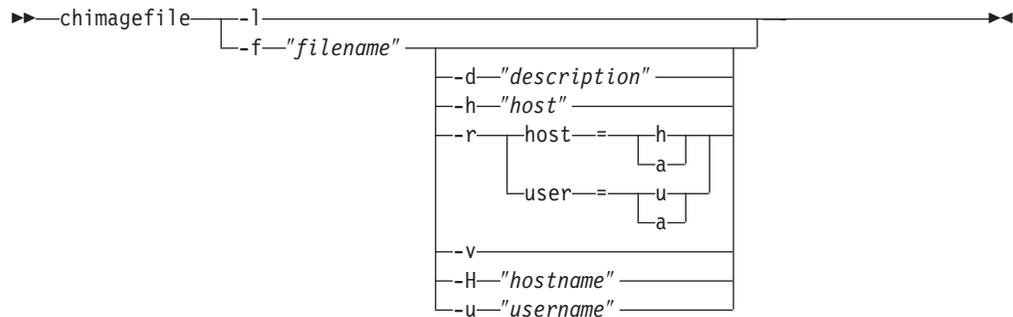
Description

When you perform a backup to a disk image file, you can set the read permission of the file to allow only the original host or original user to read from the file. You can change this permission at a later time if, for instance, you need to use an image file with "original host only" permission needs as a network installation image for other systems.

Using the **chimagefile** command, you can change the owner of the file (host or user), the backup description, or the host or user read permission of an existing image file.

Only the following users can change the read permission of a disk image file:
- Root user on the system where the file physically resides
- Root user on the system from which the file originated
- User who originally wrote the file

A file can only be accessed by the root user or by the same user who created the file if the file is in a directory the user has permission to access as defined by the **cfglocalaccess** or **cfgremaccess** commands. Only the root user can read backup image files contained in directories not explicitly defined.

Flags

–d "description"
Changes the user-defined backup description to the specified string. This description can be up to 60 characters. A longer string will be truncated to 60 characters. The description must be within double quotation marks (″) and cannot contain single or double quotation marks.

–f "filename"
Changes the filename.

–h "host"
Changes the filename on the specified host.

–l Lists the current values, separated by colons (:), in the following order:

```
host_owner:user_owner:host_perm:user_perm:description
```

This flag is normally used only by SMIT for querying the current values.

–r host=h|a
>Changes the host read permission to the specified value. The possible values are h, indicating that only the host that owns the file can read it, or a, indicating that any host can read the file. The root user on the server where the file physically resides can also access the file.

–r user=u|a
>Changes the user read permission to the specified value. The possible values are u, indicating that only the user that owns the file can read it, or a, indicating that any user can read the file. The root user on the server or the root user on the host that owns the file can also access the file. Note that if any host is allowed to access the file, but only the user that owns the file can read it, the user who owns the file can access it from any host.

–v
>Report the old and new values when they change. Without this flag, there is no output from this command.

–H "hostname"
>Changes the current owner of the file to host *hostname*. Note that, if the host read permissions are currently set to *this host only*, changing the owner of the file to a new host prevents the original host from accessing the file. The root user on the server where the file physically resides can always access the file.

–U "username"
>Changes the current user owner of the file to *username*. Note that, if the current user permission is set to *this user only*, changing the owner of the file to a new user will prevent the original user from accessing the file. The root user on the host that owns the file, or the root user on the server in which the file physically resides will always be able to access the file.

Examples

1. To change the image file **/usr/lpp/sysback/bf/pluto/root/plutoV.220934** to allow *all* users on all hosts to read this file, type:

   ```
   chimagefile -r host=a -r user=a -f \
   /usr/lpp/sysback/bf/pluto/root/plutoV.10220934
   ```

2. To change the current host of the file **/usr/lpp/sysback/images/anyhost.uvervg.043141022** to host *mercury*, and the backup description to master uservg volume group, assuming the file exists on the server *mars*, type:

   ```
   chimagefile -d "master uservg volume group" -H mercury \
   -h mars -f \
   /usr/lpp/sysback/images/anyhost.uservg.043141022
   ```

Related Information

The **cfglocalaccess** and **cfgremaccess** commands.

chinstclient

Purpose

Sets client defaults for use during a tape or network boot/installation process.

Syntax

```
►►──chinstclient──-B──"N|T|C"──-h──"host"──────────────────────────►

►──┬────────────────────────────────────┬──────────────────────────►◄
   ├─-M──"primpt|noprompt"──────────────┤
   ├─-D─────────────────────────────────┤
   ├─-C──"console device name"──────────┤
   ├─-t──"term type"────────────────────┤
   ├─-v──"root|all|import"──────────────┤
   ├─-r─────────────────────────────────┤
   ├─-l─────────────────────────────────┤
   ├─-d──"filename"─────────────────────┤
   ├─-i──"number"───────────────────────┤
   ├─-R──"y|n"──────────────────────────┤
   ├─-N──"y|n"──────────────────────────┤
   ├─-S──"ip address"───────────────────┤
   ├─-g──"ip address"───────────────────┤
   ├─-n──"device name"──────────────────┤
   ├─-s──"subnet mask"──────────────────┤
   ├─-T──"value"────────────────────────┤
   ├─-E──"en|et"────────────────────────┤
   ├─-e──"bnc|dix"──────────────────────┤
   ├─-p──"post install script file"─────┤
   ├─-L──"LVM information files"─────────┤
   ├─-o─────────────────────────────────┤
   ├─-A──"A|M|N"────────────────────────┤
   ├─-a──"device name"──────────────────┤
   ├─-P──"ports"────────────────────────┤
   ├─-B──"C|Y|N"────────────────────────┤
   └─-C──"Post first boot install script file"─┘
```

Description

The **chinstclient** command enables you to specify response to common prompts during a boot and installation process. Setting these defaults can minimize, and in some cases eliminate, the need for user prompting during a boot and installation process.

These defaults are set on a client-by-client basis.

Flags

-b "N | T | C"
Specifies if the defaults are for a tape, network boot, or CD/DVD boot and installation process.

-h "host"
Specifies the name of the client.

-M "prompt | noprompt"
Specifies whether or not to prompt the client. If this field is set to "noprompt",

the installation menus appear after a network boot. Otherwise, the installation occurs after the network boot without prompting the user, as long as all required information for the user is also provided.

-D

Turns on debug logging operations for troubleshooting network boot and installation problems.

-c "console device name"

To prevent the prompt before installation that determines the console to be used for installation, enter the name of the console here. The console can be either an LFT (graphical display) or TTY (ascii display) device. Examples are "/dev/lft0" or "/dev/tty0". If an LFT device exists on the client, you can select it by typing /dev/console.

> **Note:** You must select a display, even for no-prompt installations, in order to receive error or warning messages and to enable prompts if the default information provided is insufficient.

-t "term type"

If you specified a TTY device, specify a terminal type. This ensure that the installation menus, if required, display with the correct terminal emulation. Examples of common terminal types are "ibm3151", "tvi925", and "vt100".

-v "root | all | import"

Specifies how to handle volume group processing during installation. The available options are:

Recreate and restore rootvg only

Only the rootvg volume group is created and restored from the media, even if other volume groups are defined on the backup. At the end of the installation, rootvg is the only defined volume group.

Recreate and restore all volume groups

All volume groups included on the backup media are created and restored. Volume groups defined on the original system but whose data was not included on the backup, are created but no data is restored.

Recreate and restore rootvg and import all other volume groups from disk

The rootvg volume group is created and restored and all other volume groups are imported from disks on the client. This options assumes that the non-rootvg volume groups already exist on the client. This option is typically used when restoring the rootvg volume group after a system failure where no other volume groups were affected.

-d "filename"

Specifies the name of the installation image file that contains the backup image to be used or an installation tape device. If you are installing from a file, the directory containing the file was configured using the **cfgremaccess** command and is the only directory path available for installation image files. Specify the file here to prevent being prompted for it during installation.

-i "number"

If the client is to be installed from tape and the system backup is not the first backup on the tape, enter the backup sequence number. This number must be between 1 and the total number of system backups on the tape.

-R "y | n"

Indicates whether or not to remove the SysBack program from the system after installation. Choose "y" for yes when you have not purchased a license for the client that will be installed. The default is "n" or no.

-N "y | n"
Indicates whether or not to remove network specific information required to configure the host to the network. This option is useful when the machine installed was cloned from a backup image of a machine that is still present on the network. The default is "n" or no.

> **Note:** This option has no effect when cloning images between partitions of the same LPAR Capable machine.

-S "ip address"
The address of the installation server. If the backup media from which the client will be installed exists on a different server than the network boot server, enter the IP address of the installation server here.

> **Note:** This option is not valid for tape, CD, or DVD boot defaults.

-g "ip address"
The IP address of the gateway, if the client will be installed from a different server than the network boot server, and a different gateway address is required to reach the installation server.

> **Note:** This option is not valid for tape, CD, or DVD boot defaults.

-n "device name"
The network device name, if the client will be installed using a different network adapter than it was booted from. The name should be in the format of "entX", or "tok0".

-s "subnet mask"
The subnet mask required for the network adapter used to contact the installation server, if the client will be installed from a different network adapter than it was booted from.

> **Note:** This option is not valid for tape, CD, or DVD boot defaults.

-T "value"
The token ring speed of the network for network installations over a token ring interface. If the boot server is also the installation server, you do not need to set this option. If the installation server uses a different network adapter, and the network adapter is token ring, specify the correct token ring speed.

-E "en | et"
The ethernet interface used for network installations over an ethernet interface. If the boot server is also the installation server, you do not need to set this option. If the installation server uses a different network adapter, and the network adapter is ethernet, specify the correct interface.

> **Note:** This option is not valid for tape, CD, or DVD boot defaults.

-e "bnc | dix"
Specifies the ethernet connection type for network installation over an ethernet interface. If the boot server is also the installation server, you do not need to set this option. If the installation server uses a different network adapter, and the network adapter is ethernet, specify the correct connection.

> **Note:** This option is not valid for tape, CD, or DVD boot defaults.

-p "post install script file"
The fully-qualified path and name of a post-install script to run at the end of installation. The file must exist on the installation server and be readable by

any user. For more information about post-install scripts, see Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487.

-L "LVM information file"
The fully-qualified path and name of an LVM information file. The LVM information file must contain information that is compatible with the client. The file must exist on the installation server and be readable by any user. For more information about LVM information files, please refer to the section "Creating or Editing an LVM Information File" on page 293.

-o Overrides the **/etc/SDR_dest_info** file from the boot server. If a system backup image was created on an SP node from a different SP complex, the **/etc/SDR_dest_info** file will refer to the wrong control workstation, and post-installation customization will fail. Specifying this options causes the correct file to be copied from the boot server before the **pssp_script** post-install script runs.

Device Support to Install
This option tells SysBack how much to instal of what is contained in the media in the location specified by the **Install Device** option. The two options are:

Minimum
Selecting this option will install only those device support file sets identified by AIX when the system was booted. This information is obtained from the file **/tmp/devices.pkg**s which is created by AIX when the system was booted. This file is not always 100% accurate regarding what device support is needed as some devices return invalid installp package names rather than individual file sets. In most cases, however, this is a reliable alternative to pre-installing all device support file sets on to a system prior to creating the backup image.

ALL
Selecting this option tells SysBack to perform an install command against every item contained on the media in the specified location. This may include device support file sets or any other software that is located on the media.

Install Device
This option lets you specify a CD-ROM device name, a tape device name, or a NIM **LPPSOURCE** directory name. The NIM **LPPSOURCE** directory name provides additional device support to install during installation. This device support, if available in the specified location, will be installed in circumstances where the needed device support for this machine is contained in the boot image, not the backup image to be installed.

If this is a NIM Resource Network Boot, SysBack will automatically pulls device support from the NIM **LPPSOURCE** specified when the Network Boot client was added regardless of whether this option is edited. For additional information about configuring a NIM Resource Network Boot, please read about Chapter 15, "Network Boot/Installation Configuration," on page 207.

Firewall Communication Ports
Specify the available ports that SysBack should use for communications between the this client and the installation server. If you do not use this option, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must to be specified in one of the following ways:

- As a comma separated list of ports. For example: 1670, 1671

   Note: You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.

- As a range of ports. For example: 1670-1700.

-B ″**C**|**Y**|**N**″

The "-B" option provides 3 choices: "CLASSIC" , "Y" , and "N". This is an advanced AIX administration concept that should only be manipulated by those familiar with the AIX ODM and the AIX RDA program. The default option is "CLASSIC".

The "CLASSIC" option indicates that SysBack will process device configuration during the system installation process as it has always done prior to the implementation of this option. In the "CLASSIC" scenario, SysBack will merge the ODM device entries that were created and used by the AIX RAMFS during the initial phase of the system installation process, with the ODM stored in the backup image.

The "Y" option indicates that the ODM entries will be recovered only from the backup image. Using this option is sometimes useful in environments where devices have been given AIX names in an order that is different than how the operating system detects those devices on boot. A common example of this is seen in environments that have multiple port RAN devices with hundreds of TTYS attached.

The "N" option indicates that the ODM entries will not be recovered from the backup image. Only those devices that are detected during the system boot process will be configured. These devices will be configured with the default options. Any customized device attributes will be lost.

It is important to note that widely unpredictable results can be seen when using the "Y" and "N" options depending on your system configuration, or if you are cloning, or if you are simply restoring a backup image to the same hardware. Use this option with extreme caution. If you encounter results other than you expected after specifying the "Y" or "N" options, simply perform the system installation process again and let the process default to "CLASSIC".

Tip:

Use the "CLASSIC"option if:

- you are unfamiliar with the AIX ODM and RDA and do not have a specific need to manipulate how the operating system and SysBack detect and configure the
- you are cloning the backup image to a new machine that does not have exactly, 100% the same hardware configuration

Use the "Y" option if:

- you are restoring the backup image on the same machine as where the backup image was created.

Use the "N" option if:

- the state of your devices and their definitions is dramatically inconsistent. Using this option under these circumstances will cause the operating system to only configure physically detectable devices to their defaults. You may then begin redefining your other devices and device attributes from scratch.

-C ″**Post First Boot Script File**″
This script must exist on the system where the system backup was created. It may be located and named as you choose as long as it resides in the root volume group. This script is executed after the all data is restored as a part of the first reboot process. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well.

Note: If this script is not made executable prior to creating your backup to tape, CD, or DVD, you may still:
- add it to a customized installation diskette as explained in the section:"Creating a Custom Installation Diskette" on page 294.
- define it in the "Changing SysBack CD/DVD Boot Defaults" on page 286, the "Changing SysBack Tape Boot Defaults" on page 281, or by "Setting the Network Install Client Defaults" on page 212.
- define it in the **Post Device Configuration Options** menu described in "Post Install Configuration Options" on page 197.

editlvminfo

Purpose

Customizes an LVM information file.

Syntax

```
►►──editlvminfo──-f──"filename" ─────────────────────────────────────►◄
```

Description

The **editlvminfo** command reads the contents of the *LVM information file*, specified by the *filename* parameter and initializes the user interface used for changing the volume group, logical volume, and file system information within the file.

This option is usually used to customize a file, created with the **mkvginfo** command, before including the customized file on a backup, using the **-g** flag with either the **mklvback**, **mkjfsback**, **mkvgback** or **sysback** commands.

The user interface provides options for changing any of the information in the file, such as assigning new physical volumes to volume groups, changing the volume group where a logical volume or file system exists, and changing the sizes of logical volumes and file systems.

Detailed instructions for changing the information in the LVM information file is in Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

Related Information

The **mkvginfo**, **mklvback**, **mkjfsback**, **mkvgback** or **sysback** commands.

Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

getlvminfo

Purpose

Displays Logical Volume Manager (LVM) information for volume groups, logical volumes, and physical volumes.

Syntax
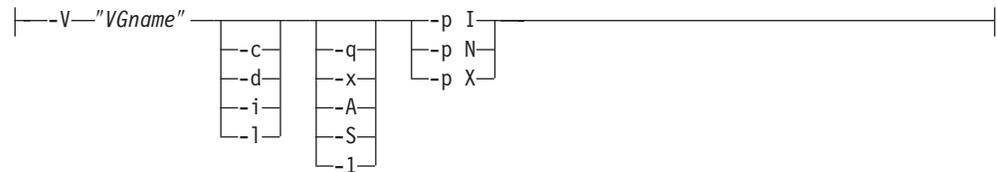
```
►►──getlvminfo──┬─ -V Option ─┬──────────────────────────────────────►◄
                ├─ -l Option ─┤
                ├─ -P Option ─┤
                └─ -G Option ─┘
```

-V Option:

```
├──-V──"VGname"──┬────┬──┬────┬──┬─ -p I ─┬───────────────────────────┤
                 ├─c─┤  ├─q─┤  ├─ -p N ─┤
                 ├─d─┤  ├─x─┤  └─ -p X ─┘
                 ├─i─┤  ├─A─┤
                 └─l─┘  ├─S─┤
                        └─1─┘
```

-l Option:

```
├──-l──"LVname"──┬────┬──┬────┬──┬────┬──┬─ -I ─┬──-h──────────────────┤
                 ├─a─┤  ├─w─┤  ├─p─┤  ├─ -N ─┤
                 ├─b─┤  ├─x─┤  └─m─┘  └─ -X ─┘
                 ├─c─┤  ├─z─┤
                 ├─d─┤  ├─X─┤
                 ├─e─┤  ├─Z─┤
                 ├─i─┤  └─1─┘
                 └─l─┘
```

-P Option:

```
├──-P──"PVname"──┬────┬──┬────┬──┬─ -I ─┬──────────────────────────────┤
                 ├─a─┤  ├─x─┤  ├─ -N ─┤
                 ├─l─┤  ├─A─┤  └─ -X ─┘
                 ├─n─┤  ├─S─┤
                 └─v─┘  └─1─┘
```

-G Option:

```
├──-G──"PVname"──┬────┬──┬─ -p I ─┬──┬─ -I ─┬─────────────────────────┤
                 ├─c─┤  ├─ -p N ─┤  └─ -N ─┘
                 ├─d─┤  └─ -p X ─┘
                 ├─i─┤
                 ├─l─┤
                 ├─s─┤
                 ├─X─┤
                 └─1─┘
```
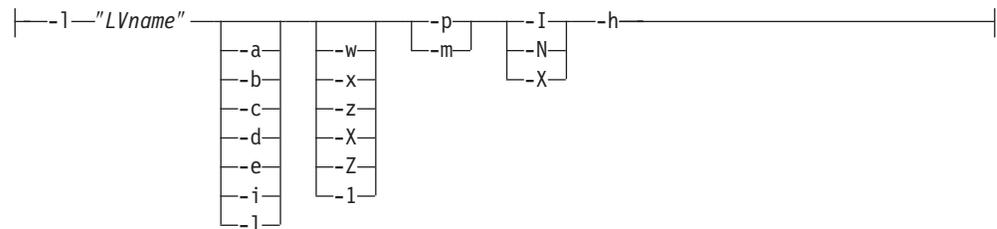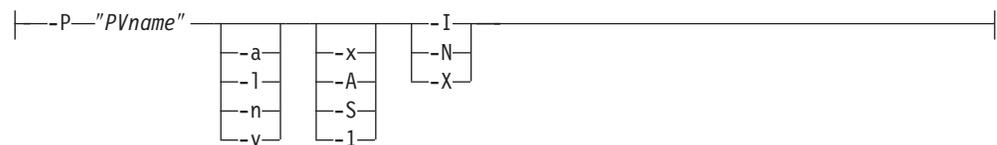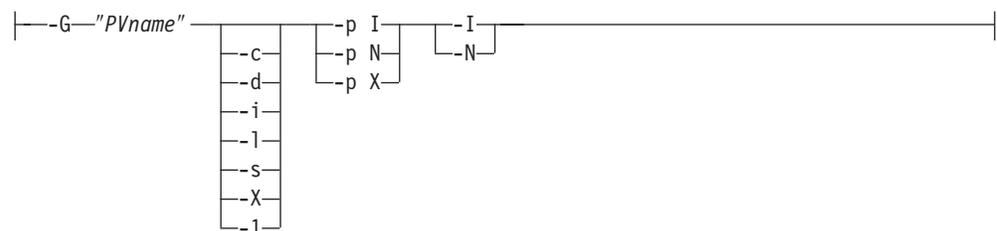
Description

This command is used to display all available *Logical Volume Manager* information for volume groups, physical volumes, and logical volumes. It retrieves LVM information for all SysBack commands requiring LVM data. The **getlvminfo** command is faster and easier than using the standard AIX LVM commands and provides the information in a simple, reliable format.

At least one argument is required. If only a single argument (**-V** or **-P**) is specified, all volume groups or physical volumes on the system, respectively, are displayed.

Any time the **-I**, **-N** or **-X** arguments are used, any physical volumes are displayed using the *PVID*, *PV Name* or *PV Location*, respectively.

One of the flags **-V**, **-P**, **-L** or **-G** must be specified to display attributes for a volume group, physical volume, or logical volume. The **-G** flag can also display volume group information for a volume group that is not currently varied on.

Flags

–1

Displays all output on a single line, separated by spaces. The default is to show each attribute on a separate line.

–a

When used with the **–L** flag, displays the intra-physical volume policy for a logical volume. When used with the **–P** flag, displays currently allocated physical partitions for a physical volume.

–b

Used with the **-L** flag to display whether or not bad block relocation is enabled for a logical volume.

–c

When used with **-V** or **-G** flag, indicates whether or not a volume group is concurrent-capable. When used with **-L** flag, indicates the number of copies for a logical volume.

–d

When used with the **-V** or **-G** flag, indicates the number of physical volumes assigned to the volume group. When used with the **-L** flag, indicates a mirror scheduling policy of either parallel (p) or sequential.

–e

Used with the **-L** flag, displays the intra-physical volume policy for a logical volume.

–h

Displays a more detailed usage message for the **getlvminfo** command to standard error.

–i

With the **-V** or **-G** flag, displays the *volume group ID* (VGID); with the **-L** flag, displays the *logical volume ID* (LVID); and with the **-P** flag, displays the *physical volume ID* (PVID).

–l

Used with the **-V** or **-G** flag to list all logical volumes names in the volume group. With the **-L** flag, indicates the logical volume *label*.

–m

Used with **-L** flag to list a *physical partition map* for the logical volume. This flag cannot be used with the **-p** flag.

–n

With the **-L** flag, indicates the number of *logical partitions* (LPs) assigned to the logical volume. With the **-P** flag, displays the total *physical partitions* (PPs) available on the physical volume.

–p

With the **-V** or **-G** flag, displays the physical volumes in the volume group. With the **-L** flag, displays the physical volumes on which a logical volume resides. This flag cannot be used with the **-m** flag.

–q

Used with the **-V** flag to indicate whether or not *quorum checking* is enabled for a volume group.

–r Used with the **-L** flag to indicate whether or not the logical volume is *relocatable*.

–s

Used with the **-L** flag to indicate whether or not a *strict allocation policy* is enabled for a logical volume, preventing a single copy from being placed on multiple physical volumes.

–t Used with the **-L** flag to display the logical volume type.

–u

Used with the **-L** flag to display the *upperbound limit* (maximum PVs) for the logical volume.

–v

With **-L** flag, displays whether or not *write-verification* is enabled. With the **-P** flag, displays the number of *volume group descriptor areas* (VGDAs) on the physical volume.

–w

With **-L** flag, displays whether or not *mirror-write-consistency checking* (MWC) is enabled.

–x

With the **-V** flag, indicates whether or not the volume group is varied on in *concurrent mode*. With the **-L** flag, indicates the *maximum logical partitions* (LPs) for the logical volume.

–z

With the **-L** flag, indicates the logical volume *stripe size*. A value of zero (0) indicates that striping is disabled.

–A

With the **-V** flag, indicates whether or not the volume group is automatically varied on at system startup.

-G "PVname"

Displays volume group information using the physical volume name instead of the volume group name.

–I Whenever physical volume information is displayed, this flag indicates that the physical volumes should be displayed using the *physical volume ID* (PVID). This is the default.

–L "LVname"

Displays attributes for the logical volume name specified.

–N

Whenever physical volume information is displayed, this flag displays physical

volumes using the physical volume name (hdiskX) rather then the PVID. When displaying a list of volume groups using the **-V** flag, this flag displays the volume groups by name rather than VGID.

–P "PVname"
When used without specifying a physical volume name, this flag displays a list of physical volumes on the system. When a physical volume name is specified, this flag displays the attributes for the specified physical volume.

–S With **-V** or **-G** flag, displays the *physical partition size* in megabytes. With the **-L** flag, displays the *logical volume state* as either syncd (0) or stale (1). With the **-P** flag, displays the *physical volume state* of either active (0), removed/missing (1), or stale (2).

–V "VGname"
When used without specifying a volume group name, this flag displays a list of volume groups on the system. Use with the **-N** flag to display the volume group list by volume group name instead of VGID. When a volume group name is provided, this flag displays the attributes for the specified volume group.

–X Any time physical volumes are displayed with this command, displays them by location code rather then by PVID.

–Z
Used with the **-L** flag to indicate the *stripe width* (number of physical volumes used in striping) for the logical volume. If a value of zero (0) is returned, striping is disabled.

Examples

1. To list the logical volumes in the *rootvg* volume group:

   ```
   getlvminfo -V rootvg -l
   ```

2. To list the *Intra-PV policy*, *Inter-PV policy*, number of copies and number of *logical partitions* for the *userlv1* logical volume on a single line:

   ```
   getlvminfo -L userlv1 -aecn1
   ```

3. To list the physical volumes in the *uservg* volume group by location code:

   ```
   getlvminfo -V uservg -pX
   ```

4. To show the physical partition map for the *datalv2* logical volume in the form *"hdiskname:PPnumber"*:

   ```
   getlvminfo -L datalv2 -mN
   ```

lscfginfo

Purpose

Prints or displays a report of the Logical Volume Manager configuration.

Syntax

```
►►──lscfginfo──┬──-f──"filename"──┬─────────────────────────────────►◄
               └──-q──"queue"─────┘
```

Description

This command prints, displays, or saves to file a report containing the system configuration. This includes all information pertaining to the volume groups, physical volumes, logical volumes, and file systems. This report contains all of the key information that might be necessary for rebuilding various components of the system in case of system failures.

In most cases, it is not necessary to use this information to recover from system failures, because the SysBack installation process and the **remakevg** command recreate volume groups, logical volumes, and file systems without requiring the user to have knowledge of the system configuration. This information, however, can be useful in planning a migration of file systems to new hardware or in reorganizing an existing system to take advantage of disk striping, mirroring, and other features.

The report output includes the following information:

Volume group information:
One record for each volume group. Contains all volume group attributes and physical volume sizes. Example:

```
Volume Group  Auto-on?  PP Size  Quorum?  Total     Used      Free      PV(s)
------------  --------  -------  -------  --------  --------  --------  --------
rootvg           y        4 MB      y       250 PPs   213 PPs    37 PPs  hdisk0
                                           1002 MB    852 MB    148 MB
```

Logical Volume Information:
One record for each logical volume. Contains most logical volume attributes and a list of the physical volumes where each logical volume resides. Example:

```
Volume Group    Logical Volume    Attributes
--------------  ----------------  ------------------------------------------
rootvg          hd8               Type:    jfslog   Copies: 1   Upper: 32
                                  LPs:     1        IntraPV: c  StrpSz: 0
                                  MinLps:  0        InterPV: m
                                  PV(s):   hdisk0
```

Physical Volume Information:
One record for each physical volume. Contains the physical volume location, size, and a map of the regions on the disk where each logical volume resides. Example:

```
PV Name   Volume Group   Location      PVID              MB    PPs
--------  -------------  ------------  ----------------  ----- ------
hdisk0    rootvg         00-00-0S-0,0  00000218acd0f607  1002  250
          LV Name               PPs       Region
          ---------------     -------   ------------
          hd8                 101       |....X.....|
          hd6                 51-62     |..X.......|
```

```
                                   73-96     |..XX......|
                 hd4               3         |X.........|
                                   102-103   |....X.....|
                 hd3               105-109   |....X.....|
                 hd2               5-27      |XX........|
                                   110-207   |....XXXXX.|
                                   222-242   |.........X|
```

Filesystem information:
Contains all file system attributes. Note that the "BF Spt" and "AG" Size fields are displayed only on AIX 4.2 or later systems.

Example:

Volume Group	Mount Point	FragSz	NBPI	Cmprs	BF Spt?	AG Size?
rootvg	/	4096	2048	no	n	8
	/home	512	4096	no	y	8
	/tmp	4096	4096	no	n	8
	/usr	4096	4096	no	n	8
	/var	512	4096	no	n	8
	/data/files	512	4096	no	y	32

Logical Volume Partition Maps:
Shows the specific physical partitions on the physical volumes that are used by each logical volume. This is helpful in determining the fragmentation of logical volumes.

Example:

```
Volume Group   Logical Volume  Copy#  PV Name    PP#s     PV Region
--------------  --------------  -----  ---------  -------  ------------
rootvg          hd8             1      hdisk0     101-101  |....X.....|
                hd6             1      hdisk0     51-62    |..X.......|
                                1      hdisk0     73-96    |..XX......|
                hd4             1      hdisk0     3        |X.........|
                                1      hdisk0     102-103  |....X.....|
                hd3             1      hdisk0     105-109  |....X.....|
                hd2             1      hdisk0     5-27     |XX........|
                                1      hdisk0     110-207  |....XXXXX.|
                                1      hdisk0     222-242  |.........X|
```

Flags

-f "filename"
Saves the report in the named file. When used, no information is displayed on the screen.

-p "queue"
Sends the report to the named print queue. When used, no information is displayed on the screen.

Related Information

The **getlvminfo** command.

mkdirback

Purpose

Backs up specified files or directories.

Syntax

```
►►──mkdirback──┬──-v──┬─────┬──-b──"size"──────────────────────────┬──────────────────►
               └──-x──┘     ├──-c──"termdev"───────────────────────┤
                            ├──-d──"description"───────────────────┤
                            ├──-e──────────────────────────────────┤
                            ├──-h──"hostname"──────────────────────┤
                            ├──-i──────────────────────────────────┤
                            ├──-I──"ID"────────────────────────────┤
                            ├──-m──"days"──────────────────────────┤
                            ├──-n──────────────────────────────────┤
                            ├──-O──────────────────────────────────┤
                            ├──-p──────────────────────────────────┤
                            ├──-r──user=u|a──host=h|a──────────────┤
                            ├──-U──"host"──────────────────────────┤
                            ├──-C──"filename"──────────────────────┤
                            ├──-E──"exclude list filename"─────────┤
                            ├──-K──────────────────────────────────┤
                            ├──-G──────────────────────────────────┤
                            ├──-J──0|1|2───────────────────────────┤
                            ├──-w──"temporary workspace directory"─┤
                            ├──-z──"cd/dvd media size"─────────────┤
                            ├──-Z──"media space available"─────────┤
                            └──-2──────────────────────────────────┘

►──-f──"device | file | directory"──directory or filename──────────────────────────►◄
```
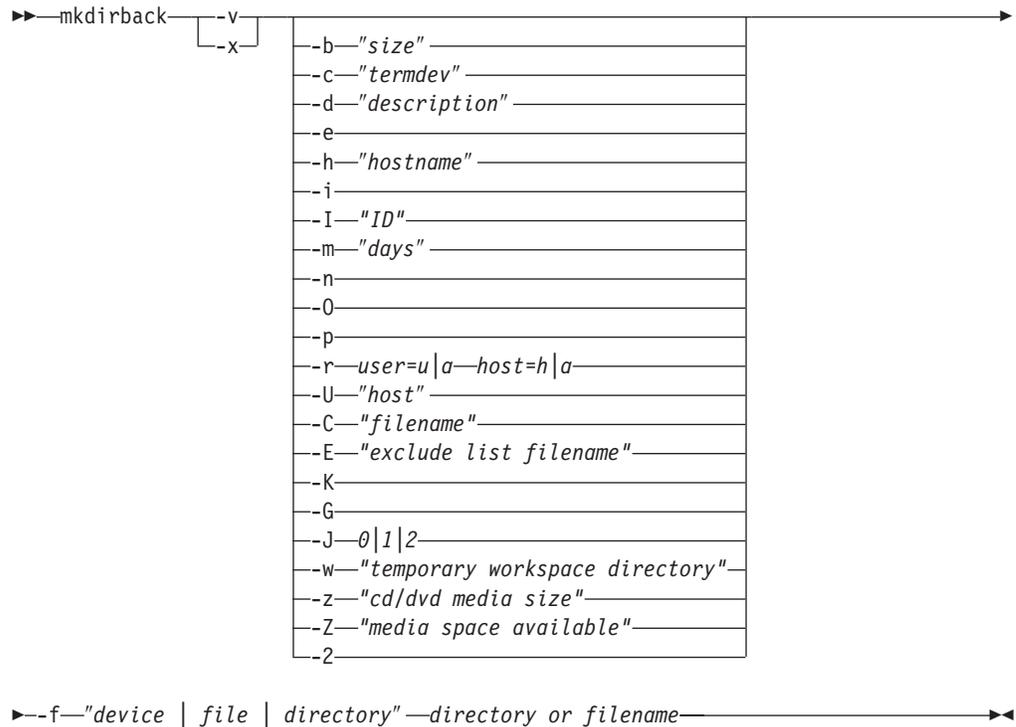
Description

The **mkdirback** command is used to back up specific files or directories. You must choose a starting directory to back up that directory and any sub-directories.

You can specify a single directory or multiple directories to include all of those directories in a single backup. You can also specify specific filenames to back up only those files. Filenames must be specified relative to the root directory by preceding the filename with a slash (/).

The backup can be performed to a tape drive, virtual device, or disk image file. When specifying a disk image file, you can enter the full pathname of the file to create or overwrite. When doing so, the filename must begin with the prefix "FD". to indicate the file is a file/directory backup. You can also specify only the backup directory and a *unique ID*. When doing so, a filename is created for you. Refer to "Backups to Disk Image Files" on page 11 for information on the filename created. If you are creating a file and a file by the same name already exists, specify the **-O** option to overwrite the existing file.

The backup can also be performed to a remote device, virtual device, or disk image file. If *Remote Services* has been configured on both the local and server system using the **cfgremsvs** command, and you have defined a backup device on the server for this system using the **cfgremaccess** command, then you can also

select a *hostname* using the **-h** option. The backup will then be written to the *device* or *filename* on the specified server, provided the server has enabled this system access to the specified device or directory.

Files, or files within directories, that are specified in the exclude list are not backed up with this command. See **chexcludelist** command for information on creating exclude lists.

Unlike all other backup types, this type of backup contains no *Logical Volume Manager* (LVM) information. Therefore, it is not possible to use this backup, regardless of its contents, for recreating volume groups, logical volumes, and file systems. Using this backup option for backing up all files on the system (from the / directory) cannot provide a backup that can be used to reinstall the system.

Some files and directories on the system, such as certain contents of the root (/) and /usr file systems, should never be restored from a backup, as this would adversely affect the active system configuration and can cause either system errors or a complete system failure. Use this command only to back up files and directories that contain non-system-related information, such as user data, application programs, and so on.

Using the **-m** option, you can also specify to back up only files that have been modified within a certain number of days. This is useful for performing daily backups. Be aware, however, that a day is considered exactly 24 hours. Therefore, always back up at least every 24 hours when specifying the **-m1** option. If, for instance, your backups were performed 1/2 hour later today than yesterday, neither today's nor yesterday's backup will contain any files changed within that 1/2 hour. It is a good idea to use **-m2** each day to ensure that no files will be skipped regardless of the time the backup is performed.

Always perform a backup of all files, regardless of date, before performing partial backups using the **-m** option. If you later need to restore files or directories, restore them from a full backup, and then restore each partial backup created after the full backup.

The backup can also be performed as a "pull" backup to enable central management of backups. The machine that "pulls" the backup is called the "initiator," while the machine that is backed up is called the "backup system." The machine that receives the backup data is called the "destination system."

The initiator is the machine where the mkdirback command is issued. The backup system is referenced in the command syntax by the **-U "host"** flag. The data destination system is referenced by the **-h "host flag".**

When only the **-U "host"** flag is specified, the **-f "device"** flag refers to a device on the initiator system. In this case, the backup destination and the initiator are the same system. This is known as a "two-way pull backup."

When the **-U "host"** and **-h "host"** flags are specified, the **-f "device"** flag refers to a device on the host specified by the **-h "host"** flag. In this case, the backup destination and the initiator are different systems. This is known as a "three-way pull backup."

Remote Services must be configured, using the **cfgremsvs** command, on all of the machines involved in the backup operation, the initiator, the backup system, and the data destination machines. The backup destination machine must have the

Server Options of Remote Services configured to allow the backup system machine to send its data to devices on the backup destination machine. You can do this with the **Add or Change Client Host Access to this Server** option or the **cfgremaccess** command.

The backup system machine must have the Client Options of Remote Services configured to specify the backup destination machine as a backup host. You can do this with the **Add or Change List of Remote Backup Servers** option or the **cfgremserver** command.

The backup system must also configure Remote Command Access to allow the initiator machine to pull the backup.

Flags

- **-x** Specifies that the progress indicator should be shown on the screen, displaying the approximate size and time to read the entire contents of the media and the amount completed. This flag cannot be used with the **-v** flag.

- **-v** Specifies that file names should be listed on the screen as the files are being backed up. This flag cannot be used with the **-x** flag.

- **–b** ″**size**″
  Specifies the buffer size in K-bytes (1024-bytes). Changing this value either increases or decreases the amount of data written to the output device at one time. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value (64 Kbytes).

- **-c "termdev"**
  If the backup spans multiple tape volumes, the volume prompt is sent to the *termdev* device (such as /dev/tty0). If the **-h** *hostname* option is specified, this flag specifies the device on the remote host.

- **-d "description"**
  A custom description to be included in the backup header. If the description includes spaces, the entire description must be enclosed in double quotation marks (″).

- **-e** Forwards to the end of the last SysBack backup on the tape and is used when stacking multiple backups on one tape.

- **-f "device| file | directory"**
  Specifies the output device name, filename, or directory for the backup. The specified output option can be on the local system or server (if **-h** option provided). Device name can be a tape drive or virtual device name. If you specify a directory, you must also specify an *ID* using the **-I** flag.

- **-h "hostname"**
  Name of the host to receive the backup data (for example, the data destination host). This is the host that provides the backup device specified using the **-f** flag.

- **-i** Indicates to dynamically create a backup file ID when writing backups to disk image file. This flag supersedes the **-I**"ID" flag.

- **-I "ID"**
  This option is used only if a directory is specified as the output device. The ID is included in the filename created to make it unique from other disk image

file backups. If a backup in the same directory with this ID already exists, specify the **-O** flag to overwrite the previous backup.

-m "days"

Specifies that only files modified within a given number of days will be backed up.

-n

Indicates that the tape should not be rewound at the beginning of the backup. Using this flag enables this backup to be appended to the previous backup performed. The tape is not automatically rewound at the end of the backup. The **-n** option is always ignored when backing up to a non-tape device.

-p

Indicates that the data should be packed before being written to the media. This typically reduces size of backup between 25% and 40%. For increased performance, do not use this options when backing up to a device that provides hardware data compression.

-O

If a filename was specified as the output device and the filename already exists, overwrites the previous file with the new backup.

–r host=h|a

Changes the host read permission to the specified value. The possible values are h, indicating that only the host that owns the file can read it, or a, indicating that any host can read the file. The root user on the server where the file physically resides can also access the file.

–r user=u|a

Changes the user read permission to the specified value. The possible values are u, indicating that only the user that owns the file can read it, or a, indicating that any user can read the file. The root user on the server or the root user on the host that owns the file can also access the file. Note that if any host is allowed to access the file, but only the user that owns the file can read it, the user who owns the file can access it from any host.

-U "host"

The name of the host to be backed up (such as the backup system).

-C filename

Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

In all other cases, use of this option is not required as the specification volume groups is indicated by "file or directory".

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of only one file, directory, logical volume, file system, or volume group name.

Note: This use of wild cards in this list is not supported.

-E *″***exclude list filename***″*
Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/.exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup specifications.

-K Use this option to indicate that you would like the atime and mtime values of your files to be returned to their pre-backup values once the backup is completed. The atime and mtime of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures″ rc=0 or rc=1″, a process will be automatically started after the reset these values immediately following the backup.

> **Note:** The atime and mtime values are collected at the start of backup processing immediately prior to backing up the files. If the atime or mtime of a file is modified during the backup process, the original atime and mtime values stored by the backup preprocessing will be restored at the end of the backup.

> **Note:** Invoking this option will increase the amount of time that it takes for the backup process to execute.

-G Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

> **Note:** If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

-J 0|1|2
Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

-w *″***temporary workspace***″*
Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

-z *″***cd/dvd media size***″*
This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split.

Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs that number appended. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

-Z ″**media space available″**
This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD 1. It is the total size left after creating the boot images, adding the device filesets and populating the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size less 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split, another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

-2 This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Examples

1. To perform a backup of the **/home/tony** directory to the backup directory **/usr/lpp/sysback/bf/root**, allowing only this user and host to read the file, and to display a progress indicator, type:

   ```
   mkdirback -f /usr/lpp/sysback/bf/root -x -r host=h -r user=u -I
   tony_tuesday /home/tony
   ```

   The above will create a file called **/usr/lpp/sysback/bf/root/ FD.**_hostname_**.tony_tuesday**.

2. To perform a remote push backup to virtual device _vdev2_ on host _jupiter_ and to make this a compressed backup of the **/data/file1** and **/data/file2** files, type:

```
mkdirback -Dph jupiter -f vdev2 /data/file1 /data/file2
```
3. To perform a backup to *rmt1* on the local system of only the files in the **/usr** and **/var** directories that have changed within the last seven days, type:
```
mkdirback -nm7 -f /dev/rmt1 /usr /var
```
4. To initiate a pull backup of **/home** on host *lasher*, from host *sysback1*, and send the data to *rmt1* of the host *sysback1*, type the following from *sysback1*:
```
mkdirback -U lasher -f /dev/rmt1 /home
```
5. To initiate a pull backup of **/home** on host *lasher*, from host *sysback1*, and send the data to *rmt1* of the host *shappy*, type the following from *sysback1*:
```
mkdirback -U lasher -h shappy -f /dev/rmt1 /home
```

Related Information

The**cfgremsvs**, **cfgremaccess**, **chexcludelist**, and **cfgremrootaccess** commands.

mkjfsback

Purpose

Performs a backup of one or more file systems.

Syntax

```
►►──mkjfsback──┬──-v──┬──────────────────────────────────────────────────►
               └──-x──┘  ┌──-b──"size"────────────────────────┐
                         ├──-c──"termdev"─────────────────────┤
                         ├──-d──"description"─────────────────┤
                         ├──-e────────────────────────────────┤
                         ├──-h──"hostname"────────────────────┤
                         ├──-i────────────────────────────────┤
                         ├──-I──"ID"──────────────────────────┤
                         ├──-l──"level"───────────────────────┤
                         ├──-M────────────────────────────────┤
                         ├──-n────────────────────────────────┤
                         ├──-O────────────────────────────────┤
                         ├──-p────────────────────────────────┤
                         ├──-r──user=u|a──host=h|a────────────┤
                         ├──-U──"host"────────────────────────┤
                         ├──-w──"temporary workspace directory"┤
                         └──-C──"filename"────────────────────┘

►──-E──"exclude list filename"──-K──-G──-J──0|1|2─────────────────────────►

►──-w──"temporary workspace directory"──-z──"cd/dvd media size"───────────►

►──-Z──"media space available"──-2──┬────────┬──-f──"device │ directory │ file"──►
                                    ├──-x──┤
                                    └──-v──┘

►──mount point────────────────────────────────────────────────────────◄◄
```
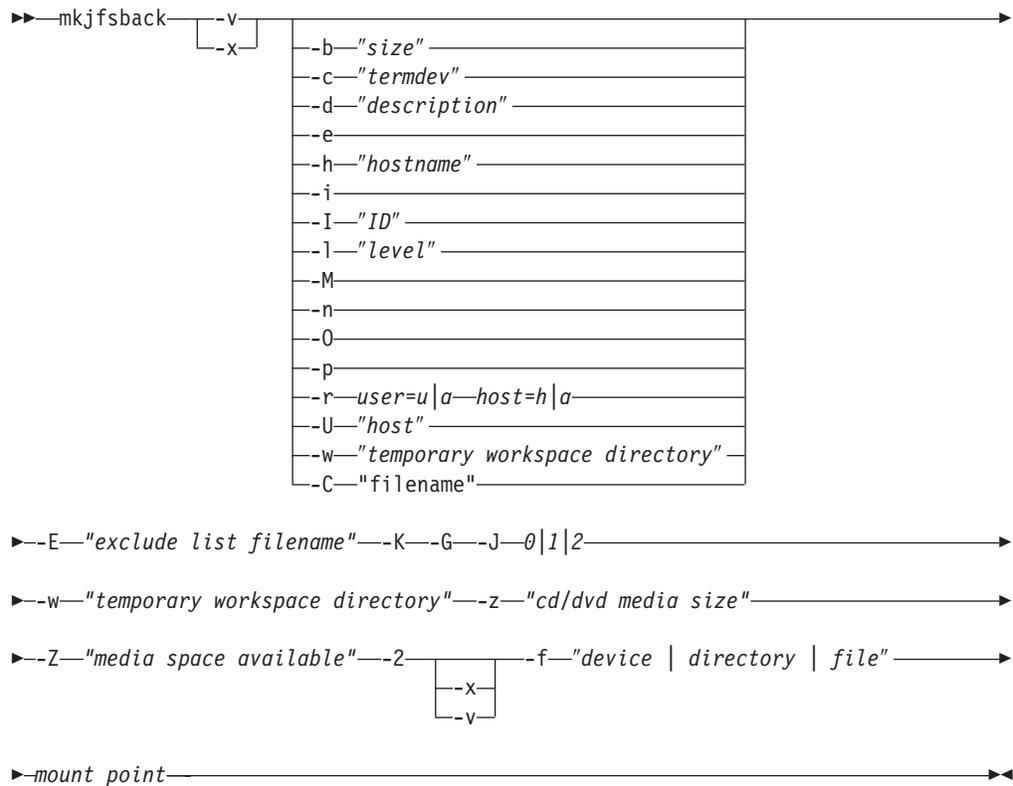
Description

The **mkjfsback** command is used to perform a backup of one or more file systems.
The mount point parameter, which is the directory name where each file system is
mounted (such as **/home**), indicates the file systems to include. You can back up
multiple file systems by appending each mount point to the end of the command,
separated by spaces.

The backup can be performed to a tape drive, virtual device, or disk image file.
When specifying a disk image file, you can enter the full pathname of the file to
create or overwrite. When doing so, the filename must begin with the prefix "FS"
to indicate the file is a file system backup. You can also specify only the backup
directory and a unique ID. When doing so, a filename will be created for you.
Refer to "Backups to Disk Image Files" on page 11 for information on the filename
created. If you are creating a file and a file by the same name already exists,
specify the **-O** option to overwrite the existing file.

The backup can also be performed to a remote device, virtual device, or disk
image file. If *Remote Services* has been configured on both the local and server
system using the **cfgremsvs** command, and you have defined a backup device on
the server for use by this system using the **cfgremaccess** command, then you can

also select a *hostname* using the **-h** option. The backup will then be written to the device or *filename* on the specified server, provided the server has enabled this system access to the specified device or directory.

A level 0 backup must be performed before any level 1-9 can be performed. Refer to "Understanding Incremental Backups" on page 19 for additional details on incremental backups.

This command does not back up files, or files within directories, that are specified in the exclude list. See the **chexcludelist** command for information on creating exclude lists.

The backup can also be performed as a "pull" backup to enable central management of backups. The machine that "pulls" the backup is called the "initiator," while the machine that is backed up is called the "backup system." The machine that receives the backup data is called the "destination system."

The initiator is the machine where the mkdirback command is issued. The backup system is referenced in the command syntax by the **-U "host"** flag. The data destination system is referenced by the **-h "host flag".**

When only the **-U "host"** flag is specified, the **-f "device"** flag refers to a device on the initiator system. In this case, the backup destination and the initiator are the same system. This is known as a "two-way pull backup."

When the **-U "host"** and **-h "host"** flags are specified, the **-f "device"** flag refers to a device on the host specified by the **-h "host"** flag. In this case, the backup destination and the initiator are different systems. This is known as a "three-way pull backup."

Remote Services must be configured, using the **cfgremsvs** command, on all of the machines involved in the backup operation, the initiator, the backup system, and the data destination machines. The backup destination machine must have the Server Options of Remote Services configured to allow the backup system machine to send its data to devices on the backup destination machine. You can do this with the **Add or Change Client Host Access to this Server** option or the **cfgremaccess** command.

The backup system machine must have the Client Options of Remote Services configured to specify the backup destination machine as a backup host. You can do this with the **Add or Change List of Remote Backup Servers** option or the **cfgremserver** command.

The backup system must also configure Remote Command Access to allow the initiator machine to pull the backup.

Flags

-x Specifies that the progress indicator should be shown on the screen, displaying the approximate size and time to read the entire contents of the media and the amount completed. This flag cannot be used with the **-v** flag.

-v Specifies that file names should be listed on the screen as the files are being backed up. This flag cannot be used with the **-x** flag.

-b "size"
Specifies the buffer size in K-bytes (1024-bytes). This value either increases or

decreases the amount of data that is written to the output device at one time. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value (64 Kbytes).

-c "termdev"
If the backup spans multiple tape volumes, the volume prompt is sent to the *termdev* device (such as /dev/tty0). If the **-h** *hostname* option is specified, this flag specifies the device on the remote host.

-d "description"
A custom description to be included in the backup header. If the description includes spaces, the entire description must be enclosed in double quotation marks (").

-e Forwards the tape to the end of the last SysBack backup. Used when stacking multiple backup images on a tape.

-f "device | file | directory"
Specifies the output device name, filename, or directory for the backup. The specified output option can be on the local system or server (if **-h** option provided). The device name can be a tape drive or virtual device name. If you specify a directory, you must also specify an *ID* using the **-I** flag.

-g "filename"
Indicates the name of an *LVM Information File* previously created and customized for this backup. Refer to the **mkvginfo** and **editlvminfo** commands.

-h "hostname"
Name of the remote backup server host to receive the backup data (such as the data destination host). This is the host that provides the backup device specified by the **-f** flag.

-i Indicates to dynamically create a backup file ID when writing backups to disk image file. This flag supersedes the **-I**"ID" flag.

-I "ID"
This option is used only if a directory is specified as the output device. The ID is included in the filename created to make it unique from other disk image file backups. If a backup in the same directory with this ID already exists, specify the **-O** flag to overwrite the previous backup.

-l "level"
Specifies the backup level (default is 0, or all files). Valid values are 0-9. Only files created or changed since the last (*level - 1*) backup was performed.

-M
Retains physical partition mapping, by default, when the logical volume is recreated from this backup. Unless the logical volume was originally created using a physical partition map, it is generally recommended that it not be recreated using the same partitions, as this would preserve fragmentation that develops over time as logical volumes and file systems are expanded. You can specify whether or not partition mapping will be used before recreating the logical volume.

-n
Indicates that the tape should not be rewound at the beginning of the backup. This enables the backup to be appended to the previous backup performed. The tape is not automatically rewound at the end of the backup. The -n option is always ignored when backing up to a non-tape device.

-O

Overwrites the previous file, if a filename was specified as the output device, and the filename already exists.

-p

Indicates that the data should be packed before being written to the media. This typically reduces size of backup between 25% and 40%. For increased performance, do not use this option when backing up to a device that provides hardware data compression.

-r user=[u|a]

Specifies user read permission when backing up to a disk image file. **"u"** indicates only the specified user can read the file. "**a**" indicates that any user can read the file.

–r host=h|a

Changes the host read permission to the specified value. The possible values are h, indicating that only the host that owns the file can read it, or a, indicating that any host can read the file. The root user on the server where the file physically resides can also access the file.

–r user=u|a

Changes the user read permission to the specified value. The possible values are u, indicating that only the user that owns the file can read it, or a, indicating that any user can read the file. The root user on the server or the root user on the host that owns the file can also access the file. Note that if any host is allowed to access the file, but only the user that owns the file can read it, the user who owns the file can access it from any host.

-C filename

Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

In all other cases, use of this option is not required as the specification volume groups is indicated by "mount point".

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of only one file, directory, logical volume, file system, or volume group name.

Note: This use of wild cards in this list is not supported.

-E ″**exclude list filename**″

Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/.exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup specifications.

-K Use this option to indicate that you would like the atime and mtime values of your files to be returned to their pre-backup values once the backup is completed. The atime and mtime of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft

failures" rc=0 or rc=1", a process will be automatically started after the reset these values immediately following the backup.

> **Note:** The atime and mtime values are collected at the start of backup processing immediately prior to backing up the files. If the atime or mtime of a file is modified during the backup process, the original atime and mtime values stored by the backup preprocessing will be restored at the end of the backup.

> **Note:** Invoking this option will increase the amount of time that it takes for the backup process to execute.

-G Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

> **Note:** If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

-J 0|1|2
Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

-w ″**temporary workspace**″
Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

-z ″**cd/dvd media size**″
This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs that number appended. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

-Z "**media space available**
This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD 1. It is the total size left after creating the boot images, adding the device filesets and populating the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size less 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split, another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

-2 This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Examples

1. To perform a local backup of the /home file system to the directory **/usr/lpp/sysback/bf/mars**, indicating that only this host and user can read the file and to display a progress indicator, type:

   ```
   mkjfsback -f /usr/lpp/sysback/bf/mars -I home4me -x \
    -r host=h -r user=u /home
   ```

   The filename created will be **/usr/lpp/sysback/bf/mars/FS.** *hostname*.**home4me**.

2. To perform a level 1 backup of the /data/files and /sales file systems as a remote push backup to */dev/rmt1* on the host *jupiter*, type:

   ```
   mkjfsback -l1 -h jupiter -f rmt1 /data/files /sales
   ```

   Note that a level 0 backup must have previously been created before a level 1 can be performed.

3. To perform a level 9 backup of the /home file system to the local virtual device *vdev1*, type:

   ```
   mkjfsback -nl9 -f vdev1 /home
   ```

   Note that the **-n** option is specified. This prevents the tape drive from being rewound before the backup begins, enabling this backup to be "stacked" on the end of the previous backup image.

4. To initiate a pull backup of the /home file system on host *lasher*, from host *sysback1*, and send the data to rmt1 of the host *sysback1*, type the following from *sysback1*:

```
mkjfsback -U lasher -f /dev/rmt1 /home
```

5. To initiate a pull backup of the /home file system on host *lasher*, from host *sysback1*, and send the datat to rmt1 of the host *shappy*, type the following command from *sysback1*:

```
mkjfsback -U lasher -h shappy -f /dev/rmt1 /home
```

Related Information

The **sysrestore**, **cfgremsvs**, **cfgremaccess**, **mkvginfo**, **editlvminfo**, **cfgremrootaccess**, and **chexcludelist** commands.

mklvback

Purpose

Performs a backup of logical volumes.

Syntax

```
►►─mklvback─┬────┬─┬──────────────────────────────────────┬─────────────────►
            ├─-v─┤ ├─-b─"size"──────────────────────────┤
            └─-x─┘ ├─-c─"termdev"───────────────────────┤
                   ├─-d─"description"───────────────────┤
                   ├─-e────────────────────────────────┤
                   ├─-g─"filename"──────────────────────┤
                   ├─-h─"hostname"──────────────────────┤
                   ├─-i────────────────────────────────┤
                   ├─-I─"ID"────────────────────────────┤
                   ├─-M────────────────────────────────┤
                   ├─-n────────────────────────────────┤
                   ├─-O────────────────────────────────┤
                   ├─-p────────────────────────────────┤
                   ├─-r─user=u|a─host=h|a───────────────┤
                   ├─-U─"host"──────────────────────────┤
                   ├─-C─"filename"──────────────────────┤
                   ├─-E─"exclude list filename"─────────┤
                   ├─-K────────────────────────────────┤
                   ├─-G────────────────────────────────┤
                   ├─-J─0|1|2───────────────────────────┤
                   ├─-w─"temporary workspace directory"─┤
                   ├─-z─"cd/dvd media size"─────────────┤
                   ├─-Z─"media space available"─────────┤
                   └─-2────────────────────────────────┘

►─-f─"device | directory | file"─LVname──────────────────────────────────────►◄
```
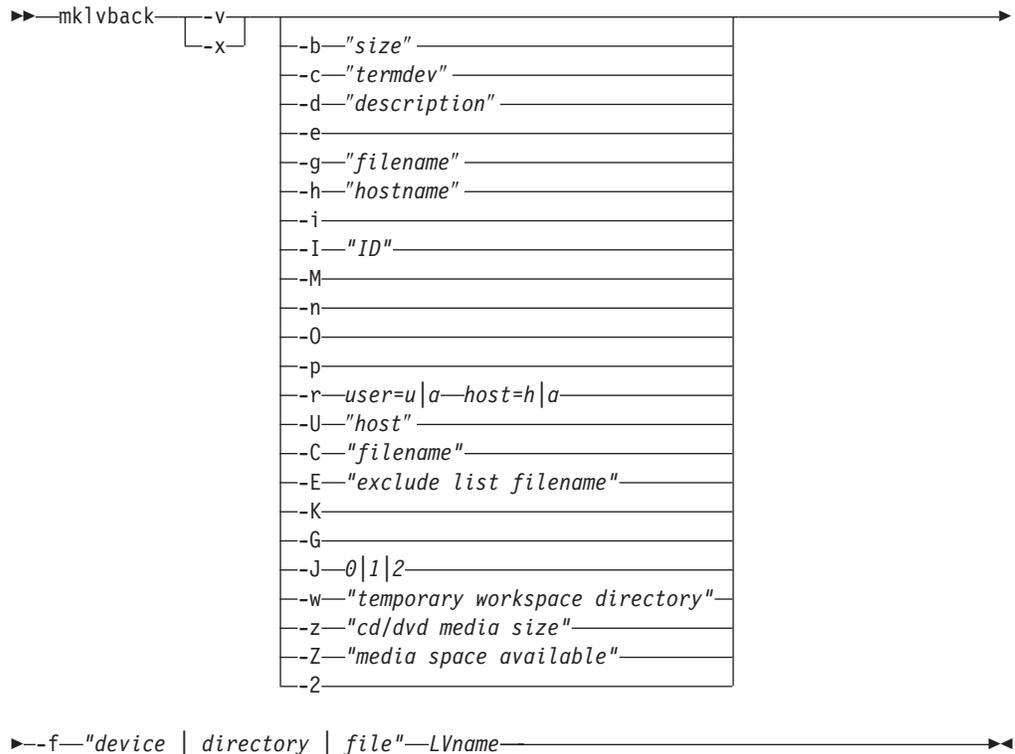
Description

The **mklvback** command is used to back up data from one or more logical
volumes. This option reads the entire logical volume, copying all "raw" data to the
specified output device or file. Many database applications use a raw logical
volume to store data, but AIX is unaware of the format of the data within the
logical volume. Therefore, this option copies the entire contents of the logical
volume, even though the application might have written to only a small portion of
the total logical volume size.

The backup can be performed to a tape drive, virtual device, or disk image file.
When specifying a disk image file, you can enter the full pathname of the file to
create or overwrite. When doing so, the filename must begin with the prefix "*LV*".
to indicate the file is a logical volume backup. You can also specify only the
backup directory and a *unique ID*. When doing so, a filename will be created for
you. Refer to "Backups to Disk Image Files" on page 11 for information on the
filename created. If you are creating a file and a file by the same name already
exists, specify the **-O** option to overwrite the existing file.

The backup can also be performed to a remote device, virtual device, or disk
image file. If *Remote Services* has been configured on both the local and server
system using the **cfgremsvs** command, and you have defined a backup device on

the server for use by this system using the **cfgremaccess** command, then you can also select a hostname using the **-h** option. The backup will then be written to the device or filename on the specified server, provided the server has enabled this system access to the specified device or directory.

You must supply one or more logical volume names with this command. Do not include the *"/dev/"* prefix with the logical volume name. If specifying more than one logical volume, append each logical volume to the end of the command, separated by spaces.

The backup can also be performed as a "pull" backup to enable central management of backups. The machine that "pulls" the backup is called the "initiator," while the machine that is backed up is called the "backup system." The machine that receives the backup data is called the "destination system."

The initiator is the machine where the mkdirback command is issued. The backup system is referenced in the command syntax by the **-U "host"** flag. The data destination system is referenced by the **-h "host flag".**

When only the **-U "host"** flag is specified, the **-f "device"** flag refers to a device on the initiator system. In this case, the backup destination and the initiator are the same system. This is known as a "two-way pull backup."

When the **-U "host"** and **-h "host"** flags are specified, the **-f "device"** flag refers to a device on the host specified by the **-h "host"** flag. In this case, the backup destination and the initiator are different systems. This is known as a "three-way pull backup."

Remote Services must be configured, using the **cfgremsvs** command, on all of the machines involved in the backup operation, the initiator, the backup system, and the data destination machines. The backup destination machine must have the Server Options of Remote Services configured to allow the backup system machine to send its data to devices on the backup destination machine. You can do this with the **Add or Change Client Host Access to this Server** option or the **cfgremaccess** command.

The backup system machine must have the Client Options of Remote Services configured to specify the backup destination machine as a backup host. You can do this with the **Add or Change List of Remote Backup Servers** option or the **cfgremserver** command.

The backup system must also configure Remote Command Access to allow the initiator machine to pull the backup.

Flags

-x Specifies that the progress indicator should be shown on the screen, displaying the approximate size and time to read the entire contents of the media and the amount completed. This flag cannot be used with the **-v** flag.

-v Specifies that file names should be listed on the screen as the files are being backed up. This flag cannot be used with the **-x** flag.

-b "size"
   Specifies the buffer size in K-bytes (1024-bytes). This value either increases or decreases the amount of data that is written to the output device at one time. Some devices with small buffers might require you to reduce this value, while

other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value (64 Kbytes).

-c "termdev"

If the backup spans multiple tape volumes, the volume prompt is sent to the *termdev* device (such as /dev/tty0). If the **-h** *hostname* option is specified, this flag specifies the device on the remote host.

-d "description"

A custom description to be included in the backup header. If the description includes spaces, the entire description must be enclosed in double quotation marks (″).

-e Forwards to the end of the last backup on the tape. Used when stacking multiple backups on one tape.

-f "device |file | directory"

Specifies the output device name, filename, or directory for the backup. The specified output option can be on the local system or server (if **-h** option provided). The device name can be a tape drive or virtual device name. If you specify a directory, you must also specify an *ID* using the **-I** flag.

-g "filename"

Indicates the name of an *LVM Information File* previously created and customized for this backup. Refer to the **mkvginfo** and **editlvminfo** commands.

-h "hostname"

Name of the remote backup server host to receive the backup data (such as the data destination host). This is the host that provides the backup device specified by the **-f** flag.

-i Indicates to dynamically create a backup file ID when writing backups to disk image file. This flag supersedes the **-I**"ID" flag.

-I "ID"

This option is used only if a directory is specified as the output device. The ID is included in the filename created to make it unique from other disk image file backups. If a backup in the same directory with this ID already exists, specify the **-O** flag to overwrite the previous backup.

-l "level"

Specifies the backup level (default is 0, or all files). Valid values are 0-9. Only files created or changed since the last (level - 1) backup was performed.

-n

Indicates that the tape should not be rewound at the beginning of the backup. This enables the backup to be appended to the previous backup performed. The tape is not automatically rewound at the end of the backup. The **-n** option is always ignored when backing up to a non-tape device.

-O

Overwrites the previous file, if a filename was specified as the output device, and the filename already exists.

-p

Indicates that the data should be packed before being written to the media. This typically reduces size of backup between 25% and 40%. For increased performance, do not use this option when backing up to a device that provides hardware data compression.

–r host=h | a

Changes the host read permission to the specified value. The possible values are h, indicating that only the host that owns the file can read it, or a, indicating that any host can read the file. The root user on the server where the file physically resides can also access the file.

–r user=u | a

Changes the user read permission to the specified value. The possible values are u, indicating that only the user that owns the file can read it, or a, indicating that any user can read the file. The root user on the server or the root user on the host that owns the file can also access the file. Note that if any host is allowed to access the file, but only the user that owns the file can read it, the user who owns the file can access it from any host.

-U "host"

Name of the host to be backed up (such as the backup system).

-M

Retains physical partition mapping, by default, when the logical volume is recreated from this backup. Unless the logical volume was originally created using a physical partition map, it is generally recommended that it not be recreated using the same partitions, as this would preserve fragmentation that develops over time as logical volumes and file systems are expanded. You can specify whether or not partition mapping will be used before recreating the logical volume.

-C Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

In all other cases, use of this option is not required as the specification volume groups is indicated by "lvname".

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of only one file, directory, logical volume, file system, or volume group name.

Note: This use of wild cards in this list is not supported.

-E "exclude list filename"

Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/.exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup specifications.

-K Use this option to indicate that you would like the atime and mtime values of your files to be returned to their pre-backup values once the backup is completed. The atime and mtime of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures" rc=0 or rc=1", a process will be automatically started after the reset these values immediately following the backup.

Note: The atime and mtime values are collected at the start of backup processing immediately prior to backing up the files. If the atime or

mtime of a file is modified during the backup process, the original atime and mtime values stored by the backup preprocessing will be restored at the end of the backup.

> **Note:** Invoking this option will increase the amount of time that it takes for the backup process to execute.

-G Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

> **Note:** If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

-J 0|1|2

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

-w ″**temporary workspace**″

Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

-z ″**cd/dvd media size**″

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs that number appended. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

-Z ″**media space available**

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD 1. It is the total size left after creating the boot images,

adding the device filesets and populating the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size less 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split, another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

-2 This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Examples

1. To perform a local backup of the lv02 logical volume to the directory **/usr/lpp/sysback/bf/root**, indicating that only this user and host can read the file and displaying a progress indicator, type:

   ```
   mklvback -f /usr/lpp/sysback/bf/root -I lv02 -x -r host=h -r user=u lv02
   ```

   The filename created will be **/usr/lpp/sysback/bf/root/LV.**_hostname_**.lv02**.

2. To perform a remote push backup to the virtual device _vdev2_ of the host _jupiter_ and to make this a compressed backup of the logical volumes _datalv_ and _datalv2_, type:

   ```
   mklvback -nph jupiter -f vdev2 datalv datalv2
   ```

   Note that the **-n** flag is specified. This prevents the tape drive from being rewound before the backup begins, enabling this backup to be "stacked" on the end of the previous backup image.

3. To initiate a pull backup of the /home file system on host _lasher_, from host _sysback1_, and send the data to rmt1 of the host _sysback1_, type the following from _sysback1_:

   ```
   mklvback -U lasher -f /dev/rmt1 /home
   ```

4. To initiate a pull backup of the /home file system on host _lasher_, from host _sysback1_, and send the data to rmt1 of the host _shappy_, type the following command from _sysback1_:

   ```
   mklvback -U lasher -h shappy -f /dev/rmt1 /home
   ```

Related Information

The **sysrestore**, **cfgremsvs**, **cfgremaccess**, **mkvginfo**, **cfgremrootaccess**, and **editlvminfo** commands.

mksbnetboot

Purpose

Creates or updates boot images on the server for booting network clients.
Configures the server to enable network booting of client machines.

Syntax

```
►►──mksbnetboot──-B──-h──"hostname" ──────────────────────────────────────────►◄
                                   ├──-a──"address" ──────┤
                                   ├──-d──"net device" ───┤
                                   ├──-g──"gateway" ──────┤
                                   ├──-s──"subnet" ───────┤
                                   ├──-u─────────────────┤
                                   ├──-S──"server addr" ──┤
                                   ├──-T──"platform" ─────┤
                                   ├──-k──"kernel" ───────┤
                                   ├──-n──"NIM SPOT" ─────┤
                                   ├──-I──"NIM LPPSOURCE" ┤
                                   └──-D─────────────────┘
```

Description

The **mksnetboot** command configures network boot clients and the boot images
required to boot them. Both NIM Resource and Classic methods are handled. See
Chapter 15, "Network Boot/Installation Configuration," on page 207 for an
explanation of NIM Resource and Classic netboot methods.

A boot image is created when a new client is configured. Boot images might need
to be updated if any server software is updated. For example, if the NIM spot has
a new software level applied to it, the corresponding boot images built from that
spot should be updated.

For the Classic netboot method, the boot images should be updated if any software
is applied to the netboot server (its /usr file system). The default case is to update
all known boot images if an update is requested.

Configuring a Network Boot Client Machine

Classic Method

Specifying the **-h**, **-a** and **-d** arguments generates the information needed to
respond to the client's BOOTP request and assigns the client the specific boot
image used to boot the client, depending on the client's machine type. However, if
you do not specify the **-a** option, the command requires, at a minimum, the **-S**, and
optionally the **-s**, and **-g** flags to add a client using this method.

You only need to run this command for clients who will *boot* from the server. For
clients that will boot from other media, such as installation diskettes or tape but
will only install from this server, you do not need to run this command.

If the network adapter has been changed in the client system, you might need to
update the server to reflect the new hardware address of the client machine. You
can update the boot client information if already configured by following the same
steps as for a new client. This overwrites the previous information.

When you add a network boot client that uses NIM resources, the **-d**, **-T**, **-k**, **-S**, **-s**, **-g**, and **-a** flags are not valid. The information that would be contained in these flags is contained in the NIM resource definition for the client. The required flags to add a NIM Resource Network Boot client are **-h**, **-n**, and **-l**.

Rebuilding Existing Network Boot Images

If you update or install software on the boot source, you must also update the boot image. For the Classic boot method, the boot source is the **/usr** directory of the boot server. For the NIM Resource Network Boot, the boot source is the NIM **SPOT** resource.

To rebuild the boot image for either method, use one of the following commands. To rebuild all existing boot images, type:

```
mksbnetboot -B ALL
```

To rebuild a specific build image, type:

```
mksbnetboot -B <image name>
```

A Note About the Network Hardware Address

The **-a** flag is used to specify the adapter "hardware" address, which differs for each adapter manufactured. The adapter address is needed by the server before it can respond to BOOTP requests.

Enter this parameter only for **PCI-based RISC System (rspc)** clients, or if you want the client to boot using a *broadcast BOOTP* request. By entering the adapter hardware address for a non-rspc client, that client can be booted without filling out the server information in the BOOTP screen at system startup. This is accomplished by sending a broadcast BOOTP request that the server responds to by identifying the hardware address of the client's network adapter. This information is not used by non-RISC PC clients requiring a gateway to reach the server.

Flags

-a "address"
Specifies the adapter hardware address of your network adapter. Note that this is *not* referring to the Internet (IP) address, but the hardware adapter address. This information is required on **PCI-based RISC System (rspc)** clients and is not used by other clients requiring a gateway to reach the server.

-d "net device"
Specifies the name of the network adapter for the network the clients will be booted from. You can also specify a network adapter type of either *ethernet* or *token-ring* if a device of the client's network adapter type does not exist on the server.

-g "gateway"
Gateway address the client must use to reach this server, if any.

-h "hostname"
Specifies the name of the host to which the boot image is to be assigned or the client to be removed from the network boot configuration.

-k "kernel"
> Indicates the kernel type, either "up" for uniprocessors or "mp" for multiprocessors.

-u
> Specifies that the hostname is to be unconfigured as a network boot client.

-s "subnet"
> Subnet mask of the client. The default is 255.255.255.0.

-B
> Specifies to update a network boot image.

-n
> The name of the NIM spot. The **–n** flag implies NIM netboot mode and also requires the **–l** flag. Valid spot names can be discovered using the command **lsnim –t spot**.

-l The name of the NIM lpp_source. The **–l** flag also requires the **–n** flag. Use the command **lsnim –t spot** to find valid lpp_source names.

-S "server addr"
> IP address of the server. The default is the primary IP address of the current system. Specify this value only if the server has multiple IP addresses. Specify the address the client will use to contact the server.

-T "platform"
> The platform type of the client. Use the **-k** kernel flag to indicate the kernel type.
>
> The following platform types are currently supported:
>
> **rs6k**   Classic RISC System/6000
>
> **rspc**   PCI-based (PC) RISC System/6000
>
> **chrp**   Common Hardware Reference Platform

-D
> Indicates to build the network boot image with the AIX Kernel Debugger enabled. Use this flag for diagnostic purposes only. To use this flag, you must have a terminal attached to the machine's s1 port in order to interact with the kernel debugger to initiate the network boot. It is important to note the diagnostic value that is provided at the end of the boot image build. This alphanumeric word is a storage address used by the debugger at boot time.

Examples

1. To add a network boot client named "mars" and create a network boot image for a Multiprocessor RISC System/6000 platform on a token ring network using the Classic netboot method, type:

   ```
   mksbnetboot -h mars -T rspc -K up -d token ring -S 9.19.134.93
   ```

2. To add a network boot client named "lasher" using the NIM resource method with a NIM **SPOT** called "spot_aix433" and an **LPPSOURCE** called "lpp_aix433", type:

   ```
   mksbnetboot -h lasher -n spot_aix433 -l lpp_aix433
   ```

3. To rebuild all previously configured network boot images, type:

   ```
   mksbnetboot -B all
   ```

Files

/etc/bootptab   Contains entries for response to BOOTP requests received from the network.

/tftpboot/*hostname*   A symbolic link to an actual network boot image file for the specific hostname.

/usr/lpp/sysback/netinst/boot Directory where the actual boot images are stored.

mkvgback

Purpose

Performs a backup of one or more volume groups.

Syntax

```
►►──mkvgback──┬──────┬──┬────────────────────────────────────┬──────────────────►
              ├─ -v ─┤  ├─ -b ─"size" ────────────────────────┤
              └─ -x ─┘  ├─ -c ─"termdev" ─────────────────────┤
                        ├─ -d ─"description" ─────────────────┤
                        ├─ -e ────────────────────────────────┤
                        ├─ -g ─"filename" ────────────────────┤
                        ├─ -h ─"hostname" ────────────────────┤
                        ├─ -i ────────────────────────────────┤
                        ├─ -I ─"ID" ──────────────────────────┤
                        ├─ -l ─"level" ───────────────────────┤
                        ├─ -m ─"days" ────────────────────────┤
                        ├─ -M ────────────────────────────────┤
                        ├─ -n ────────────────────────────────┤
                        ├─ -O ────────────────────────────────┤
                        ├─ -p ────────────────────────────────┤
                        ├─ -r ─user=u|a─host=h|a ─────────────┤
                        ├─ -U ─"host" ────────────────────────┤
                        ├─ -X ────────────────────────────────┤
                        ├─ -C ─"filename" ────────────────────┤
                        ├─ -E ─"exclude list filename" ───────┤
                        ├─ -K ────────────────────────────────┤
                        ├─ -G ────────────────────────────────┤
                        ├─ -J ─0|1|2 ─────────────────────────┤
                        ├─ -w ─"temporary workspace directory" ┤
                        ├─ -z ─"cd/dvd media size" ───────────┤
                        ├─ -Z ─"media space available" ───────┤
                        └─ -2 ────────────────────────────────┘

►──-f─"device | directory | file" ─VGname──────────────────────────────────────►◄
```
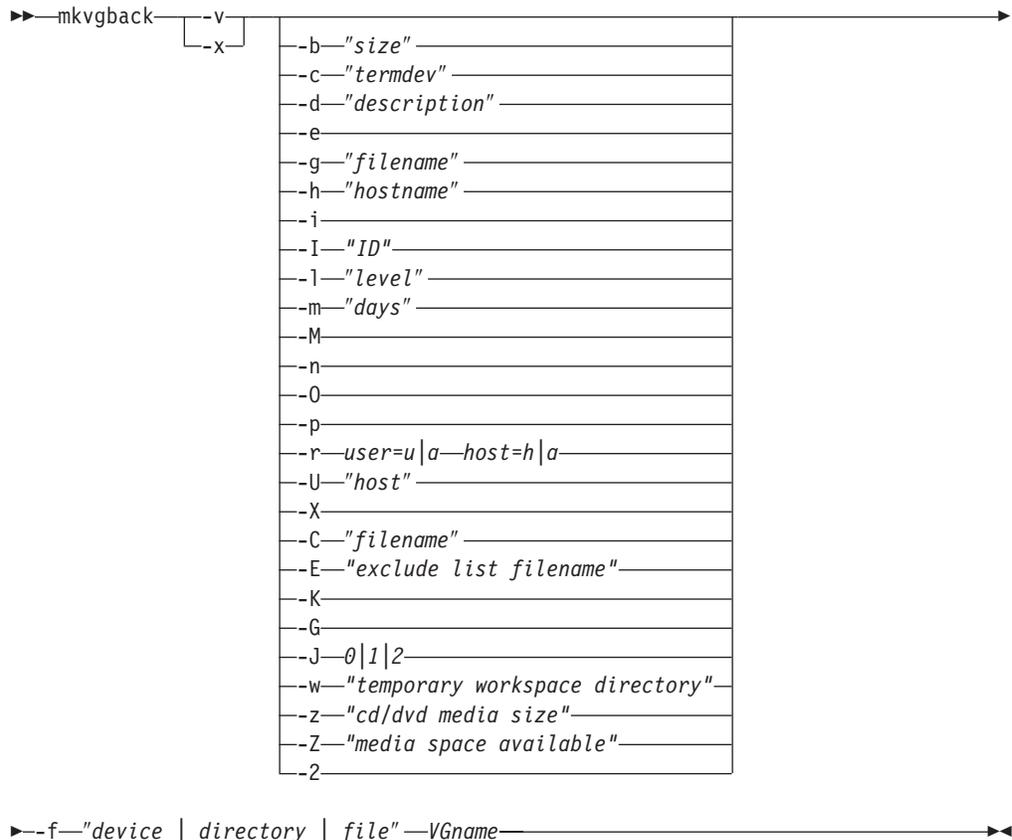
Description

The **mkvgback** command is used to find and back up all files belonging to the specified volume group or groups.

The backup can be performed to a tape drive, virtual device, or disk image file. When specifying a disk image file, you can enter the full pathname of the file to create or overwrite. When doing so, the filename must begin with the prefix *"VG".* to indicate the file is a volume group backup. You can also specify only the backup directory and a *unique ID*. When doing so, a filename will be created for you. Refer to "Backups to Disk Image Files" on page 11 for information on the filename created. If you are creating a file and a file by the same name already exists, specify the **-O** option to overwrite the existing file.

The backup can also be performed to a remote device, virtual device, or disk image file. If *Remote Services* has been configured on both the local and server system using the **cfgremsvs** command, and you have defined a backup device on the server for use by this system using the **cfgremaccess** command, then you can also select a hostname using the **-h** option. The backup will then be written to the

device or filename on the specified server, provided the server has enabled this system access to the specified device or directory.

The **-l level** option indicates that an incremental backup will be performed.

A level 0 backup must be performed before any level 1-9 can be performed. Refer to "Understanding Incremental Backups" on page 19 for additional details on incremental backups.

Files, or files within directories, that are specified in the exclude list will not be backed up with this command. See the **chexcludelist** command for information on creating exclude lists.

The backup can also be performed as a "pull" backup to enable central management of backups. The machine that "pulls" the backup is called the "initiator," while the machine that is backed up is called the "backup system." The machine that receives the backup data is called the "destination system."

The initiator is the machine where the mkdirback command is issued. The backup system is referenced in the command syntax by the **-U "host"** flag. The data destination system is referenced by the **-h "host flag."**

When only the **-U "host"** flag is specified, the **-f "device"** flag refers to a device on the initiator system. In this case, the backup destination and the initiator are the same system. This is known as a "two-way pull backup."

When the **-U "host"** and **-h "host"** flags are specified, the **-f "device"** flag refers to a device on the host specified by the **-h "host"** flag. In this case, the backup destination and the initiator are different systems. This is known as a "three-way pull backup."

Remote Services must be configured, using the **cfgremsvs** command, on all of the machines involved in the backup operation, the initiator, the backup system, and the data destination machines. The backup destination machine must have the Server Options of Remote Services configured to allow the backup system machine to send its data to devices on the backup destination machine. You can do this with the **Add or Change Client Host Access to this Server** option or the **cfgremaccess** command.

The backup system machine must have the Client Options of Remote Services configured to specify the backup destination machine as a backup host. You can do this with the **Add or Change List of Remote Backup Servers** option or the **cfgremserver** command.

The backup system must also configure Remote Command Access to allow the initiator machine to pull the backup.

Flags

-x Specifies that the progress indicator should be shown on the screen, displaying the approximate size and time to read the entire contents of the media and the amount completed. This flag cannot be used with the **-v** flag.

-v Specifies that file names should be listed on the screen as the files are being backed up. This flag cannot be used with the **-x** flag.

-b "size"

Specifies the buffer size in K-bytes (1024-bytes). This value either increases or decreases the amount of data that is written to the output device at one time. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value (64 Kbytes).

-c "termdev"

If the backup spans multiple tape volumes, the volume prompt is sent to the *termdev* device (such as /dev/tty0). If the **-h** *hostname* option is specified, this flag specifies the device on the remote host.

-d "description"

A custom description to be included in the backup header. If the description includes spaces, the entire description must be enclosed in double quotation marks (").

-e   Forwards the tape to the end of the last Sysback backup. Used when stacking multiple backup images on a tape.

-f "device | file | directory"

Specifies the output device name, filename, or directory for the backup. The specified output option can be on the local system or server (if **-h** option provided). The device name can be a tape drive or virtual device name. If you specify a directory, you must also specify an *ID* using the **-I** flag.

-g "filename"

Indicates the name of an *LVM Information File* previously created and customized for this backup. Refer to the **mkvginfo** and **editlvminfo** commands.

-h "hostname"

Name of the remote backup server host to receive the backup data (such as the data destination host). This is the host that provides the backup device specified by the **-f** flag.

-i   Indicates to dynamically create a backup file ID when writing backups to disk image file. This flag supersedes the **-I**"ID" flag.

-I "ID"

This option is used only if a directory is specified as the output device. The ID is included in the filename created to make it unique from other disk image file backups. If a backup in the same directory with this ID already exists, specify the **-O** flag to overwrite the previous backup.

-l "level"

Specifies the backup level (default is 0, or all files). Valid values are 0-9. Only files created or changed since the last (*level - 1*) backup was performed.

-M

Retains physical partition mapping, by default, when the logical volume is recreated from this backup. Unless the logical volume was originally created using a physical partition map, it is generally recommended that it not be recreated using the same partitions, as this would preserve fragmentation that develops over time as logical volumes and file systems are expanded. You can specify whether or not partition mapping will be used before recreating the logical volume.

-n

Indicates that the tape should not be rewound at the beginning of the backup. This enables the backup to be appended to the previous backup performed.

The tape is not automatically rewound at the end of the backup. The **-n** option is always ignored when backing up to a non-tape device.

-O

Overwrites the previous file, if a filename was specified as the output device, and the filename already exists.

-p

Indicates that the data should be packed before being written to the media. This typically reduces size of backup between 25% and 40%. For increased performance, do not use this option when backing up to a device that provides hardware data compression.

–r host=h|a

Changes the host read permission to the specified value. The possible values are h, indicating that only the host that owns the file can read it, or a, indicating that any host can read the file. The root user on the server where the file physically resides can also access the file.

–r user=u|a

Changes the user read permission to the specified value. The possible values are u, indicating that only the user that owns the file can read it, or a, indicating that any user can read the file. The root user on the server or the root user on the host that owns the file can also access the file. Note that if any host is allowed to access the file, but only the user that owns the file can read it, the user who owns the file can access it from any host.

-U "host"

Name of the host to be backed up (such as the backup system).

-v Specifies that file names should be listed on the screen as the files are being backed up. This flag cannot be used with the **-x** flag.

-x Specifies that the progress indicator should be shown on the screen, displaying the approximate size and time to read the entire contents of the media and the amount completed. This flag cannot be used with the **-v** flag.

-X

Excludes all non-JFS (journaled file system) logical volumes, or "raw" logical volumes, from the backup.

-C filename

Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

In all other cases, use of this option is not required as the specification volume groups is indicated in the field by "vgname".

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of only one file, directory, logical volume, file system, or volume group name.

Note: This use of wild cards in this list is not supported.

-E *"exclude list filename"*

Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/.exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup specifications.

-K Use this option to indicate that you would like the atime and mtime values of your files to be returned to their pre-backup values once the backup is completed. The atime and mtime of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures" rc=0 or rc=1", a process will be automatically started after the reset these values immediately following the backup.

> **Note:** The atime and mtime values are collected at the start of backup processing immediately prior to backing up the files. If the atime or mtime of a file is modified during the backup process, the original atime and mtime values stored by the backup preprocessing will be restored at the end of the backup.

> **Note:** Invoking this option will increase the amount of time that it takes for the backup process to execute.

-G Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

> **Note:** If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

-J 0|1|2

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0 "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1 "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2 "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

-w *"temporary workspace"*

Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

-z *"cd/dvd media size"*

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split.

Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split another file called **SB.sysback1.hd2.2** would then be created automatically. Each time another split occurs that number appended. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

-Z ″**media space available**

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD 1. It is the total size left after creating the boot images, adding the device filesets and populating the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size less 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added
- 25 MB for MCA boot image
- 25 MB for RSPC boot image
- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split, another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

-2 This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Examples

1. To perform a level 1 backup of the *vg00* volume group to the directory **/usr/lpp/sysback/bf/saturn/root**, listing the files as they are backed up, type:

   ```
   mkvgback -vf /usr/lpp/sysback/bf/saturn/root -I vg00_lev1 -l1 vg00
   ```

   The file created will be **/usr/lpp/sysback/bf/saturn/root/VG.***hostname***.vg00_lev1**.

2. To perform a remote backup to the virtual device *vdev3* on the host *jupiter* that is a compressed backup of the *uservg1* and *uservg2* volume groups and to display a progress indicator, type:

   ```
   mkvgback -pxh jupiter -f vdev3 uservg1 uservg2
   ```

3. To perform a remote backup to the virtual device */dev/rmt1* of the *data1* volume group, including only the files created or changed in the last two days, type:

```
mkvgback -nf /dev/rmt1 m2 data1
```

4. To initiate a pull backup of the /home file system on host *lasher*, from host *sysback1*, and send the data to rmt1 of the host *sysback1*, type the following from *sysback1*:

```
mkvgback -U lasher -f /dev/rmt1 /home
```

5. To initiate a pull backup of the /home file system on host *lasher*, from host *sysback1*, and send the datat to rmt1 of the host *shappy*, type the following command from *sysback1*:

```
mkvgback -U lasher -h shappy -f /dev/rmt1 /home
```

Related Information

The **sysrestore**, **cfgremsvs**, **cfgremaccess**, **mkvginfo**, **cfgremrootaccess**, **editlvminfo** and **chexcludelist** commands.

mkvginfo

Purpose

Generates information needed in recreating volume groups and logical volumes from backups.

Syntax

```
►►──mkvginfo─┬───────────────┬──── -v ─VGname── -l ─LVname──────────────────►◄
             ├─ -f ──────────┤
             ├─ -M ──────────┤
             └─ -o ─"filename" ─┘
```

Description

The **mkvginfo** command is automatically executed by each SysBack backup command that stores LVM information on the backup. This information contains the volume group, logical volume, filesytem, and physical volume attributes that can be later used to recreate any of the preceding from the backup media.

The arguments supplied to the command and the resulting output depend on the type of backup performed. This command sends the results to standard output (stdout) by default, unless the **-o** *filename* option is specified.

This command generates LVM information for either a list of volume groups, if the **-v** *VGnames* option is specified, or for a list of logical volumes if the **-l** *LVnames* option is specified. If the logical volumes contain file systems, the file system attributes are recorded as well.

The output contains a label, indicating the record type, followed by the attributes for the particular label. The contents of the **/etc/filesystems** file, for the logical volumes involved, are appended to the end of the file.

The information contained in the output is as follows:

System Information (one of each of the following):

TYPE	Backup type (VG, LV, SYSTEM, POWER)
VERSION	Version and Release of AIX (such as "4.1")
PLATFORM	Platform Type (such as rs6k)
KERNEL	Kernel Type (up/mp)
SBVER	SysBack Version, Release and Modification Level (such as 050301)

Table of contents (one record, indicates volume group data, if any, included on backup):

TOC	Static Header
vgname(s)	List of volume groups (separated by spaces)
x	Static Trailer

Physical Volumes (one record for each):

PV	Static Header
PVid	Physical volume ID

Physical Volumes (one record for each):

Location	Location Code (address)
Hdiskname	Hdisk Name (not used)

Volume Groups (one record for each):

VG	Static Header
vgname	Volume Group name
autoon	Auto varyon at system startup? (Y/N)
ppsize	Physical partition (in MB)
vgopt	[C]reate/[I]mport/[X]Ignore
quorum	Are quoroms active? (Y/N)
concurrent	Concurrent-capable? (y/n)
autoconc	Auto-Concurrent Varyon? (y/n)
pvlist	List of physical volume IDs

Logical Volumes (one record for each)

LV	Static Header
priority	(01=mapped, 02=striped, 03=boot, 04=jfslog, 10=paging, 20=jfs, 90=dump)
mountpt	File system mount point or '-' if not jfs
vgname	Volume group name
lvname	Logical volume name
type	Logical volume type (see priority)
createopt	Create this LV? (Y/N)
origmb	Original size in MB
lps	Size to create in LPs (can change by user)
copies	Number of copies (#PPs per LP)
minips	Minimum LPs to contain file system data (1 if not jfs)
intra	Intra-pv allocation policy (ie/im/c/om/m/oe/e)
inter	Inter-pv allocation policy (m/x)
upper	Represents the LV upper bound limit. The value represents the maximum PVs allowed when inter-pv allocation policy for the LV is set to `maximum`
mzxlps	Maximum LPs for this LV
mwc	Mirror-write-consistency on? (y/n)
bbpolicy	Bad block relocation? (y/n)
relocatable	Can LV be relocated? (y/n)
strict	Can multiple copies be place on one PV? (y/n)
verify	Write verify? (y/n)
stripesz	Stripe Size
stripewd	Stripe width
ppmap	Create using physical partition map? (y/n)
LVpvlist	Physical volume IDs

Filesystems (JFS and JFS2 only - one record for each):

FS	Static Header
mountpt	Mount point (same as in LV record)
vgname	Volume Group name
lvname	Logical Volume name
fragsize	Fragment Size
nbpi	Number of bytes per inode
compress	Compress? (LZ, no)
bfsupport	Big File Support? (y/n) (AIX 4.2+)

Filesystems (JFS and JFS2 only - one record for each):

agsize   Allocation Group Size (#MB) (AIX 4.2+)

Physical Partition Maps (one or more each logical volume – each not to exceed 50 PPs):

PP	Static Header
lvname	Logical Volume name
ppno:ppvid	Physical partition number: physical volume ID (one for each PP in the LV)

Filesystem stanzas (one record for each):

Stanza taken directly from **/etc/filesystems** file

The information produced by this command is placed on the beginning of each backup and can be read from the backup using the **sbread** command with the **-T** flag.

Including a customized LVM information file on a backup: You can create and customize an LVM information file to be included on a SysBack backup. This information enables you to later recreate volume groups, logical volumes, or file systems using the customized attributes without requiring the user to make the changes manually using the menu options.

To do so, use the following steps:

1. Use the **mkvginfo** command to create an LVM information file. Use the **-o** *filename* option to specify an output filename.

2. Use the **editlvminfo** command to edit the file using the menus and options described in Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

3. Create the backup using the **mkjfsback**, **mklvback**, **mkvgback** or **sysback** commands. Use the **-g** *filename* option with the command to include the customized file instead of generating a new one.

Flags

-f Indicates the command should continue even if file systems are not mounted. Ordinarily, this command fails if a file system is not mounted.

-l Indicates that a list of logical volumes is supplied and that the LVM information should be generated only for the specified logical volumes and file systems, if applicable.

-M
Indicates that the default when recreating the logical volume or logical volumes is to recreate using physical partition maps. If not specified, the default is to recreate the logical volumes using contiguous partitions on the physical volumes, whenever possible.

-o "filename"
The name of the file where the output should be sent. If not specified, output is sent to standard output.

-v Indicates that a list of volume groups is supplied and that the LVM information should be generated for the specified volume groups.

Files

/etc/filesystems   Contains file system stanzas that are copied to the output of this command for each logical volume containing a file system.

Related Information

The **mkjfsback**, **mklvback**, **mkvgback**, **sysback**, **editlvminfo** and **sbread** commands.

readsbheader

Purpose

Reads the header label on any SysBack backup.

Syntax

```
▶▶──readsbheader────────────────────────────────────────────────  -f──"device"  ──────────────────────────────────────────▶◀
                    ├─-c──"termdev"──┤
                    ├─-d────────────┤
                    ├─-h──"hostname"──┤
                    ├─-i──"sequence"──┤
                    ├─-l────────────┤
                    ├─-n────────────┤
                    └─-q────────────┘
```
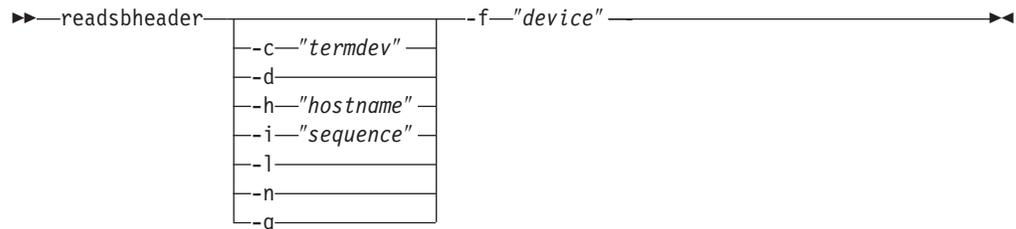
Description

The **readsbheader** command can be used to read the header information on any SysBack backup. It can be used to list the general header information, the list of images (logical volumes and file systems) included on the backup, and the list of files and directories included on the backup. This command is useful for reading the contents of an unknown backup tape when no printed label was affixed.

If the backup media is a tape that contains multiple backups, you can read the header information from any backup on the tape by using the **-i** "sequence" option. The sequence refers to the backup sequence number, "1" being the first backup on the tape and so on.

Flags

-c "termdev"
> If the backup contains multiple tape volumes, the volume prompt is sent to the display indicated by "termdev" (such as /dev/tty0 or /dev/lft0). If the **-h** "hostname" option is specified, this flag specifies the display on the remote host.

-d
> Indicates that a list of logical volumes and file systems included on the backup should be displayed also.

-f "device or file"
> Tape device, virtual device, or filename containing the backup. If a filename is specified, the information is read from the file on the disk with the ".**TOC**" extension. You do not need to supply this extension.

-h "hostname"
> Hostname of backup server to which the remote backup device is attached.

-i "sequence"
> Indicates the backup sequence number to read. "1" refers to the first backup on the tape, and so on. The default is "1." This option can be specified only when reading from a tape drive or virtual device.

-l Indicates that a list of files and directories included on the backup should be displayed. This file list can be very long. The directories are listed first, followed by the regular files.

-n

Indicates that tape drives should not be rewound prior to reading. This assumes that the tape drive is already positioned at the beginning of the backup to read.

-q

Indicates that no status messages should be displayed while searching and reading the backup media.

Examples

1. To show the general header information on a backup in tape device */dev/rmt0*, on host *mars*, type:

   ```
   readsbheader -f rmt0 -h mars
   ```

2. To read the contents of the third backup on virtual device *vdev2*, including the list of logical volumes, file systems, directories and files on the backup, type:

   ```
   readsbheader -dli3 -f vdev2
   ```

Related Information

The **sbread** and **sbwrite** commands.

remakevg

Purpose

Recreates one or more specified volume groups, logical volumes, or file systems from LVM information contained on the backup media.

Syntax

```
►►──remakevg──┬──────────────────┬──  -f─"device"──  -v─VGname──l─LVname──────────►◄
              ├──-c─"termdev"─────┤
              ├──-E──────────────┤
              ├──-n──────────────┤
              ├──-h─"hostname"────┤
              ├──-i─"sequence"────┤
              ├──-L─"LVname"──────┤
              ├──-q──────────────┤
              ├──-V─"VGname"──────┤
              └──-P──────────────┘
```

Description

Use the **remakevg** command to recreate one or more volume groups, logical volumes, or file systems using information contained on any backup type except for the file/directory backup. A volume group, logical volume, or file system can only be recreated from a backup containing the specified data, unless the backup is a system backup, which contains the information needed to recreate any volume group, logical volume, or file system regardless of the data included on the backup.

After the LVM information is read from the backup, a verification ensures that the correct physical volumes and space are available to create the volume group and logical volumes. If not, you will be required to change the LVM information to satisfy the space requirements.

If the verification fails, or if the **-E** flag is specified, a user-interface enables you to view or change the LVM information before the volume groups, logical volumes, or file systems are created. Refer to Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165 for details on changing the LVM information.

If the **-E** option is not specified, and there are no problems detected when verifying the consistency between the LVM information and the current system configuration, the volume groups, logical volumes, and file systems are recreated without additional user-interaction. However, unless the **-q** option is provided, you will be asked to confirm before any recreation takes place.

Note: By default, the **remakvg** command recreates the volume group, logical volume, and file system structures but does not restore the data into them. Use the **sysrestore** command to restore the data separately.

Flags

-c "termdev"
> If the backup contains multiple tape volumes, the volume prompt is sent to the

display indicated by "termdev" (such as /dev/tty0 or /dev/lft0). If the **-h** "hostname" option is specified, this flag indicates the display on the remote host.

-E
Displays the user-interface menus to enable the LVM information to be changed before the volume groups, logical volumes, or file systems are created.

-f "device or file"
Tape device, virtual device, or filename containing the backup. If a filename is specified, the information is read from the file on the disk with the "**.TOC**" extension. You need not supply this extension of the filename.

-h "hostname"
Hostname of backup server to which the remote backup device is attached.

-i "sequence"
Indicates the backup sequence number to read. "1" refers to the first backup on the tape, and so on. The default is "1". This option can be specified only when reading from a tape drive or virtual device.

-l Indicates that logical volumes (and file systems, if applicable) should be created and that the logical volume list is provided at the end of the command.

-L "LVname"
To recreate a logical volume under a different name, specify the new LVname. This enables you to recreate the logical volume even if the original still exists on the system. This flag is applicable only when recreating a logical volume, and you can only specify one logical volume name to create when using this flag.

-v Indicates that volume groups should be created and that a list of volume groups is provided at the end of the command.

-V "VGname"
If creating a single volume group: To recreate the volume group under a different name, specify the new VGname. This enables the volume group to be created even though the original still exists.

If creating a logical volume: Indicates the volume group name the logical volume will be created in. Used to move a logical volume from one volume group to another.

-q
Specifies that no status messages should be displayed while reading the information from the backup media.

-n
Specifies that the tape is already positioned at the beginning of the select volume group (on stacked tapes).

-P Specify this option if you would like the permissions of the file system(s) to be restored from the backup during the process to recreate the structure.

Examples

1. To recreate a volume group from a backup on tape device /dev/rmt0, previously called *uservg*, under the new name *newuservg*:

   ```
   remakevg -f /dev/rmt0 -v -V newuservg uservg
   ```

2. To recreate the *lv00* and *lv01* logical volumes from a volume group backup image file on host *venus*, placing the logical volume in volume group *vg01*, type:

```
remakevg -l -h venus -V vg01 -f \
      /usr/lpp/sysback/bf/VG.saturn.12300200 lv00 lv01
```

3. To recreate the *datavg1* and *datavg2* volume groups from the backup on virtual device *vdev0*, enabling the user to change the LVM information prior to the creation, type:
```
remakevg -Ev -f vdev0 datavg1 datavg2
```

Related Information

The **sysrestore** command.

Chapter 13, "Changing the Volume Group, Logical Volume and File System Attributes," on page 165.

sbalog

Purpose

Changes, lists, or displays the SysBack log.

Syntax

```
►►─sbalog─┬──────────────────────────┬─────────────────────────►◄
          ├──-o──────────────────────┤
          ├──-l──────────────────────┤
          ├──-C──────────────────────┤
          ├──-f─"path and filename"──┤
          └──-s─"size"───────────────┘
```
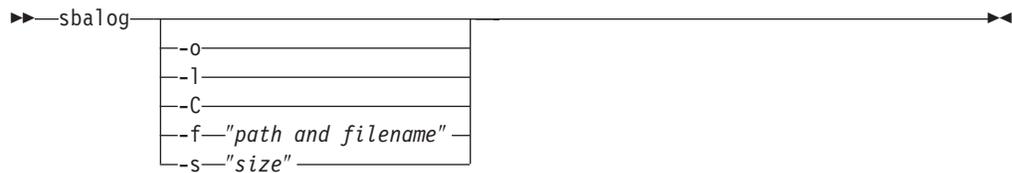
Description

The SysBack log file provides a mechanism to track the completion status of SysBack backup, restore, and verify operations. For information about the SysBack log file, see Chapter 21, "Logging," on page 319.

Flags

-o   Lists the contents of the SysBack log file.

-l   Displays the current size and location of the SysBack log file.

-C

Changes the size or location of the SysBack log. You must use either the **-f** or **-s** flag with this flag.

-f "path and filename"
Specifies the location of the SysBack log. Used with the **-C** flag.

-s "size"
Specifies the size of the SysBack log in multiples of 4096 bytes.

Examples

1. To change the SysBack log location to **/tmp/logs/sysback.log**, type:
   ```
   sbalog -C -f /tmp/logs/sysback.log
   ```
2. To change the size of the log to 8192 bytes, type:
   ```
   sbalog -C -s 8192
   ```
3. To change the size and location of the log, type:
   ```
   sbalog -C -f/tmp/logs/sysback.log -s 8192
   ```
4. To list the contents of the log, type:
   ```
   sbalog -o
   ```

Files

/var/adm/ras/sysback.log
    The default SysBack log file.

Related Information

The **cfgremsvs**, **cfgremaccess**, **sbread**, **sbwrite**, and **cat** commands.

sbclient

Purpose

Performs all SysBack remote command execution.

Syntax

```
▶▶──sbclient──-i──┬──hostname──┬──command-argument────────────────────────▶◀
                  └──IPaddress──┘
```

Description

The **sbclient** command is used to execute all remote commands in SysBack. It can be used only after Remote Services has been configured on the local and remote system using the **cfgremsvs** command, and the remote system has granted permission to the local user and host to perform remote commands using the **cfgremaccess** command.

When **cfgremsvs** command is run, a user called *sbnet* is created. All remote commands are executed under this user. There is no need for the username on the local system to exist on the remote system for the local user to execute remote commands. The *sbnet* user must have UNIX file permissions to access any devices or directories that any remote user will need to write to.

To specify the remote hostname on which the command will be executed, you can specify either a hostname or an IP address. The hostname might require the full domain name to reach the remote host.

Only commands that are specified in the.**remote_cmds** file on the server can be executed remotely. Any attempt to execute a remote command not defined in this file will fail.

The **-i** flag indicates that the command should read standard input from the user or that standard input will be piped to the remote command from a local command. If the **-i** flag is not specified and input is requested from the remote command, the command locks up indefinitely. The **-i** flag can be specified, however, even if no input is requested, but performance might be affected.

The **sbclient** command causes the **sbserver** command to be executed on the remote system. The **sbserver** command is a daemon that establishes the socket connection with the local system, sets environment variables, executes the specified command, reads input, and writes output to the socket.

In addition to the standard environment variables used for login users, the following environment variables are automatically set on the remote system before the remote command is executed:

CLIENT_BDIRS
   Specifies one or more backup directories, separated by colons, as defined in the.**remote_access** file, to which this host and user can read or write.

CLIENT_DEVS
   Specifies one or more devices, separated by colons, as defined in the .**remote_access** file, to which this host and user can read or write.

CLIENT_HOST

Hostname or full domain name (if required) of client host performing the command.

CLIENT_HOSTPERM

Indicates the hostname, as it appears in the **.remote_access** file, that granted permission to the client. This can be the client hostname, the full domain name of the client, or *all*.

CLIENT_IDIRS

Specifies one or more installation image directories, separated by colons, as defined in the **.remote_access** file, to which this host and user can read or write.

CLIENT_IPADDR

IP address of the client host performing the command.

CLIENT_USER

User name on the client host performing the command.

CLIENT_USERPERM

Indicates the user name, as it appears in the **.remote_access** file, that grants permission to the client. This is either the same as *CLIENT_USER* or *all*.

The above environment variables can be accessed by the remote applications running on the server and can also be queried from the client using a command such as:

```
sbclient Remotehost echo \$CLIENT_DEVS
```

Flags

-i Indicates the remote command must receive standard input from the local system. Use this flag only when executing an interactive command or piping data to the command.

Examples

1. To read the header of a remote backup tape in device */dev/rmt0* on host *saturn*, type:

   ```
   sbclient saturn sbread -H /dev/rmt0.1
   ```

2. To copy the file **/tmp/imagefile** to the remote host *neptune*, type:

   ```
   cat /tmp/imagefile | sbclient -i neptune \
        "cat > /tmp/imagefile"
   ```

   In this example, the local file **/tmp/imagefile** is sent as input to the **sbclient** command. The **cat** command is executed on the remote system, which copies the data received into a new file **/tmp/imagefile**. Note that the new file on the server will be owned by the *sbnet* user ID.

Files

/usr/lpp/sysback/.remote_access

Contains list of hosts and users that are allowed to execute commands on the local system.

/usr/lpp/sysback/.remote_cmds

Contains list of commands that can be remotely executed on the local system.

Related Information

The **cfgremsvs**, **cfgremaccess**, **sbread**, **sbwrite**, and **cat** commands.

sbcomp and sbuncomp

Purpose

Compresses and decompresses data respectively.

Syntax

```
►►──sbcomp──────────────────────────────────────────────────────────────►◄



►►──sbuncomp────────────────────────────────────────────────────────────►◄
```

Description

The **sbcomp** command compresses data from standard input and sends the resulting compressed data to standard output. The **sbuncomp** command uncompresses data from standard input and sends the resulting decompressed data to standard output.

The **sbcomp** and **sbuncomp** commands are used as filters and use only memory to perform the compression or decompression (there is no intermediate file storage used). Performing software compression and decompression uses a great deal of CPU resource and can affect the overall performance of the system. If the data is to be written to a hardware device that performs its own compression, do not compress the data before writing to the media, as this uses CPU resources unnecessarily.

If you select to compress data before writing to media when performing any SysBack backup command with the **-p** flag, the resulting backup data is piped through the **sbcomp** command before sending it to the **sbwrite** program, which places the data on the output media. The SysBack restore commands always read the backup header to determine if the data on the backup was compressed using **sbcomp**, and then pipe the data output by **sbread** to the **sbuncomp** program before the data is restored to disk.

Flags

None.

Examples

1. To compress data in the file **/data** and send the results to **sbwrite** to write to the tape drive */dev/rmt0*, type:
   ```
   cat /data | sbcomp | sbwrite -Svp -tl -nrawlv /dev/rmt0
   ```
2. To decompress and restore the file **/data** from the backup performed above, type:
   ```
   sbread -Sv /dev/rmt0 | sbuncomp > /data
   ```

Related Information

The **sbread** and **sbwrite** commands.

sbcron

Purpose

Adds, updates, lists, or removes a regularly scheduled command.

Syntax

```
►►─sbcron──┬─-n─┬──┬────────────────┬──-I──"ID#"──-s──"script"──────────────►
           ├─-u─┤  ├─-m──"minutes"──┤
           ├─-r─┤  ├─-h──"hours"────┤
           └─-l─┘  ├─-d──"day"──────┤
                   ├─-M──"month"────┤
                   └─-w──"weekday"──┘

►──-D──"description"──────────────────────────────────────────────────────►◄
```
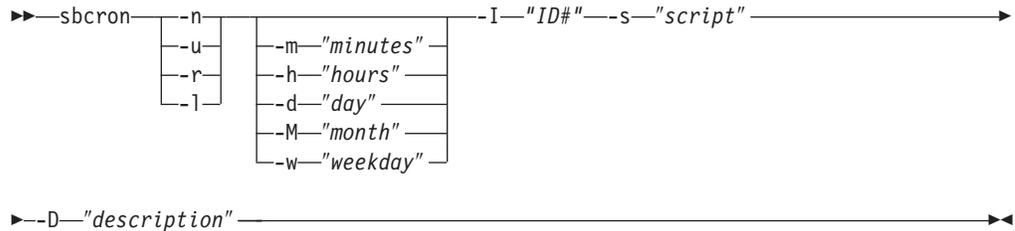
Description

The **sbcron** command is used to add, update, list, or remove a regularly scheduled command. Regularly scheduled commands are scheduled using one or more of the following flags: **-m**, **-d**, **-M**, or **-w**.

The following rules apply to this command:

- You must use a whole number for the **-m**, **-h**, **-d**, **-M**, and **-w** flags.
- To indicate an inclusive range, use two numbers separated by a dash. For example, to schedule a command to run Tuesday through Friday, use the **-w** flag with a value of "2-5".
- To indicate that a script should be run on separate days (not an inclusive range), separate the numbers with a comma. For example, to schedule a command to run on the first and last day of January, use the following flags:

  `-M 1 -d 1,31`

  Note: Do not use a space after the comma.
- When you add or update a new entry (created using **-n**), you must use the **-m** and **-h** flags.
- If the **-d**, **-M**, or **-w** flags are omitted, all allowed values will be used in place of the missing flag. For example, to schedule a command to run at 6:30 AM every day of every month, use the following syntax:

  `sbcron -s /vg_backup -m 30 -h 6`

  To schedule a command to run at 6:30 AM every *Monday* of every moth, use the following syntax:

  `sbcron -s /vg_backup -m 30 -h 6 -w 1`

Flags

-n

    Creates a new schedule for the script defined with the **-s** flag.

-u

    Updates an existing schedule.

-r   Removes an existing schedule.

-l   Lists all scheduled SysBack scripts.

-m ″**minutes**″

Specifies the minutes for scheduling a script. Valid values are from 1 to 60.

-h ″**hours**″

Specifies the hour for scheduling a script. Valid values are 0 to 23, where 0 is equal to 12:00 AM, and 23 is equal to 11:00 PM.

-d ″**days**″

Specifies the day a script should be scheduled. Valid values are from 1 to 31.

-M ″**month**″

Specifies the month a script should be scheduled. Valid values are from 1 to 12, where 1 is equal to January, and 12 is equal to December.

-w ″**weekday**″

Specifies the day of the week a script should be scheduled. Valid values are from 0 to 6, where 0 is equal to Sunday and 6 is equal to Saturday.

-I ″**ID#**″

Specify the SysBack ID number of the script to remove.

-s ″**script**″

The script to be scheduled.

-D ″**description**″

Enables you to include a custom description. This description is included in the list created using the **-l** flag.

Examples

1. To schedule the **vg_backup** script:

   ```
   sbcron -m 0 -h 23 -w 1-5 -s /scripts/vg_backup
   ```

2. To schedule the **system_backup** script to run at 12:00 AM on the first, fifteenth, and thirtieth of each month:

   ```
   sbcron -m 0 -h 0 -d 1,15,30 -s /home/scripts/system_backup
   ```

3. To schedule the **fs_backup** script to run at 6:30 AM every Monday, Wednesday, and Friday:

   ```
   sbcron -m 30 -h 6 -w 1,3,5 -s /fs_backup
   ```

4. To schedule the **system_backup** script to run every day at 12:00 AM:

   ```
   sbcron -m 0 -h 0 -s /system_backup
   ```

5. To remove the schedule with an ID of SB102:

   ```
   sbcron -r -I SB102
   ```

6. To obtain a listing of schedules:

   ```
   sbcron -l
   ```

sbdefaults

Purpose

This command modifies backup and restore program defaults.

Syntax

```
▶▶──sbdefaults─────────────────────────────────────────────────────▶◀
              ├─-B──"B│T"────┤
              ├─-Z──"path"───┤
              ├─-z──"path"───┤
              ├─-E──"email"──┤
              ├─-e──"email"──┤
              ├─-R──"value"──┤
              ├─-C──"value"──┤
              ├─-c──"value"──┤
              ├─-P───────────┤
              ├─-p───────────┤
              ├─-b──"value"──┤
              ├─-s──"value"──┤
              ├─-r──"value"──┤
              ├─-N───────────┤
              └─-n───────────┘
```

Flags

-B ″**B│T**″
Use this flag to specify that SysBack should use the AIX ″backup/restore″
commands or the AIX ″tar″ command. The default is the ″backup/restore″
commands and should not be changed unless there is a specific need for the
functions of the ″tar″ command that the ″backup/restore″ commands do not.

Note: Changing this option to ″T″ could cause the program to behave
differently that you may expect. Use this option with caution.
This flag is optional.

-Z ″**path**″
Use this flag to specify the fully qualified path and file name that represents a
script/program that will be called by SysBack at the end of tape during write
operations. This is for use with tape library systems that require special
commands to load, move, or unload tapes in the library. Since SysBack does
not control the tape library, this provides the administrator a mechanism to
write their own custom script that will perform tape operations for SysBack
when the end of tape (EOT) is reached. This is not required when the tape
library is an ″autoloader″ because the hardware performs tape loads and
unloads if properly configured. This script must reside on the host where the
tape drive is attached. This flag is optional.

-z ″**path**″
Use this flag to specify the fully qualified path and file name that represents a
script/program that will be called by SysBack at the end of tape during read
operations. This is for use with tape library systems that require special
commands to load, move, or unload tapes in the library. Since SysBack does
not control the tape library, this provides the administrator a mechanism to
write their own custom script that will perform tape operations for SysBack
when the end of tape (EOT) is reached. This is not required when the tape

library is an "autoloader" because the hardware performs tape loads and unloads if properly configured. This script must reside on the host where the tape drive is attached. This flag is optional.

-E "**email**"

Specify an email address that SysBack should use to send a message when the end of tape (EOT) is reached during write operations. This should be in the form of username@host.domain. For example: john@doe.com or john@localhost. This is useful in situations where you would like an email to be sent to someone when the end of tape is reached so that the recipient will know that it is time to change the tape. You must have previously configured the system where the tape library is attached to use sendmail. SysBack is simply using the AIX 'mail' command to send this message. An improperly configured mail application will result in SysBack's mail message to not be sent. This flag is optional.

--e "**email**"

Specify an email address that SysBack should use to send a message when the end of tape (EOT) is reached during read operations. This should be in the form of username@host.domain. For example: john@doe.com or john@localhost. This is useful in situations where you would like an email to be sent to someone when the end of tape is reached so that the recipient will know that it is time to change the tape. You must have previously configured the system where the tape library is attached to use sendmail.SysBack is simply using the AIX 'mail' command to send this message. An improperly configured mail application will result in SysBack's mail message to not be sent. This flag is optional.

-R "**value**"

Use this flag to specify the maximum number of media read errors that should be allowed to occur during a restore or verify operation before the process aborts. To fail on all read errors, select "0". The default value is 50. The largest number you may enter is 32768. This flag is optional.

-C "**value**"

Use this flag to specify the maximum number of data sync errors that should be allowed to occur during a restore or verify operation before the process aborts. To fail on all read errors, select "0". The default value is 50. The largest number you may enter is 32768. This flag is optional.

-c "**value**"

Use this flag to specify the maximum number of retries that should be attempted after a media read error. For each retry, some data will be lost (variable by device). For some devices, retries will always fail. Select "0" if retries should not be attempted. The default is 2000, which will allow recovery from most media surface errors. The value may not exceed 32768. This flag is optional.

-P

Use this flag to indicate that unreadable data should be replaced with NULL (\0) bytes to preserve data offsets. If not, the unreadable data will simply be omitted. For raw logical volume restores, this will result in the data following the read error being restored to a different offset. The default is the default. This flag is optional.

-p Use this flag to indicate that unreadable data should not be replaced with NULL (\0) bytes to preserve data offsets. Therefore, the unreadable data will

simply be omitted. For raw logical volume restores, this will result in the data following the read error being restored to a different offset. This flag is optional.

-b ″**value**″
Use this flag to specify the size of the data buffer to be written to the socket in a single read or write operation. The default is 32768 bytes. This flag is optional.

-s ″**value**″
Use this flag to specify the size of the TCP ″send buffer″ size in bytes. The default is 16384 bytes. This flag is optional.

> **Note:** This flag corresponds to the ″tcp_sendspace″ option of the AIX ′no′ command but only impacts sockets opened by SysBack.

-r ″**value**″
Use this flag to specify the size of the TCP ″receive buffer″ size in bytes. The default is 16384 bytes. This flag is optional.

> **Note:** This flag corresponds to the ″tcp_recvspace″ option of the AIX ′no′ command but only impacts sockets opened by SysBack.

-N Use this flag to specify if TCP packets should be sent immediately, instead of gathering small amounts of data into a single packet. (tcpnodelay=yes). This option only affects network sockets opened by SysBack for backup or restore operations. This flag is optional.

-n Use this flag to specify if TCP packets should be should gather small amounts of data rather than being sent immediately. This option only affects network sockets opened by SysBack for backup or restore operations. This option is the default. This flag is optional.

sbdevice

Purpose

Checks tape drive availability and controls tape movement.

Syntax

```
►►──sbdevice───┬────────┬───────device───────────────────────────────────►◄
               ├──-b────┤
               ├──-B────┤
               ├──-e────┤
               ├──-f──"num"──┤
               ├──-n────┤
               ├──-q────┤
               ├──-r────┤
               ├──-s────┤
               ├──-v────┤
               └──-w────┘
```
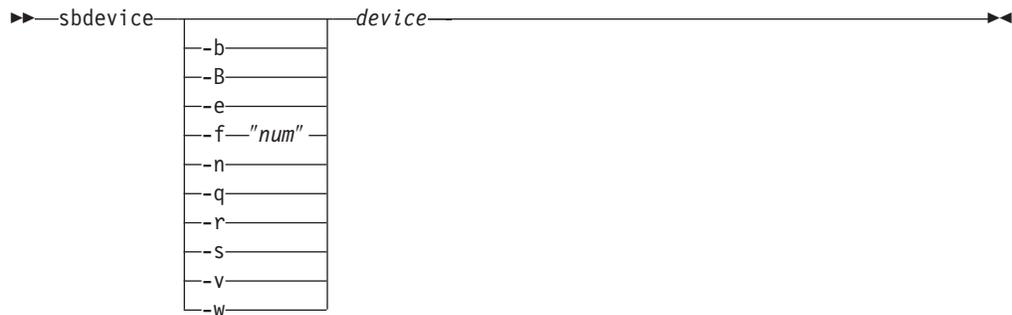
Description

The **sbdevice** command is used to check the availability of the specified tape drive or drives and to perform other tape commands. Either tape drive names or a virtual device name can be specified for the *device* parameter.

For tape devices, you only need to specify the base device name (for example, *rmt0*). The tape will not be moved unless rewinding, forwarding, or backspacing, regardless of the tape device names or virtual device name specified.

Flags

-b

Causes a tape drive or virtual device to back up a file mark. If the drive is at the beginning of a backup image, it will be positioned at the start of the previous backup image. If the drive is currently within a backup image, it will be returned to the start of the current image.

-B

Reads and returns the current block size of the tape drive. A value of 512 is returned for all other device types.

-e Rewinds and *ejects* tapes from the specified drives. If a sequential autoloader is used, the next sequential tape is inserted automatically.

-f "num"

Forwards the tape past the specified "num" number of file marks. This is used to position to the next backup image on the tape.

-n

Indicates that the program is to exit with an error code if any errors should occur. The default action is to display a message on most errors and wait for the tape to reset.

-q

Indicates that no errors should be displayed. The command exits with a non-zero return code if an error occurs.

-r Rewinds the specified device or devices.

-s Checks if the tape drive is currently at the beginning of the tape. Return code of 0 indicates the tape is not rewound; 1 indicates the tape is rewound.

-v Indicates that messages (such as "*Rewinding /dev/rmt0 ...*") should be displayed as operations are performed on each tape drive.

-w

Indicates that the device or devices should be checked for write permission. For tapes, the write-protect switch is checked and an error is returned if it is set. For files, an error is returned if the user does not have write permission to the file or directory.

Examples

1. To read the current block size of tape drive */dev/rmt0*, type:

   ```
   BS=vsbdevice -B rmt0v
   ```

2. To rewind and eject all tapes from drives included in the *vdev0* virtual device, showing messages as the drives are rewound, type:

   ```
   sbdevice -ve vdev0
   ```

3. To only check for write permission to the file or directory **/usr/lpp/sysback/images/venus.rootvg.01201244**:

   ```
   sbdevice -w /usr/lpp/sysback/images/local/VG.venus.01201244
   ```

4. To rewind device */dev/rmt0* and */dev/rmt1*, indicating that the command should not wait if an error occurs, type:

   ```
   sbdevice -nr rmt0 rmt1
   ```

sbejecttape

Purpose

Used to eject either a local or remote tape drive or SysBack virtual device.

Syntax

```
►►──sbejecttape──-f──"device"──-h──"hostname"────────────────────────►◄
```

Description

Use this command to eject a tape from a local or remote tape drive or from a
SysBack virtual device.

Flags

-f ″**device**″
    Specifies the output device name. The device can be a tape drive or a virtual
    device name and can be located on the local system or a server (if the **-h** flag is
    also used).

-h ″**hostname**″
    Specifies the remote tape server host to which the device is attached. This
    option is available only for remote backups after both the tape server and the
    local machine have been properly configured.

sbeot

Purpose

Forwards to the end of the data on a SysBack-created tape.

Syntax

```
►►──sbeot──┬──-f──"device"────┬────────────────────────────────►◄
           ├──-h──"hostname"──┤
           └──-q──────────────┘
```

Description

Use this command to forward to the end of the last backup on a tape created by one of the following SysBack commands: **sysback**, **mkvgback**, **mkjfsback**, **mkdirback**, **mklvback**. You can then append another SysBack backup to the end of the data on the tape.

The following restrictions apply:

* All the images on the tape must have been created by SysBack Version 4 or higher.
* The tape on which you want to append a backup must be loaded in the tape drive. For example, if the previous backup spanned three tapes, you must load the third tape into the tape drive before running the **sbeot** command.

Flags

-f *"device"*
> Specifies the output device name. The device can be a tape drive or a virtual device name and can be located on the local system or a server (if the **-h** flag is also used).

-h *"hostname"*
> Specifies the remote tape server host to which the device is attached. This option is available only for remote backups after both the tape server and the local machine have been properly configured.

-q
> Suppresses the output. The command displays error messages if they occur.

Examples

1. To position the tape to the end of SysBack data using a device located on a local system:

   ```
   sbeot -qf /dev/rmt0
   ```

2. To position the tape to the end of SysBack data using a device located on a remote system:

   ```
   sbeot -h hercules -f /dev/rmt1
   ```

sbfirewall

Purpose

This command allows you to define network communication ports for use by SysBack communications in environments using fire walls.

Syntax

```
►►──sbfirewall──┬──-a──┬──┬──-c──┬──┬──-h──"host name"──┬──┬──-p──"port numbrs"──┬──►◄
                ├──-r──┤  └──-s──┘  └──────────────────┘  └────────────────────┘
                └──-l──┘
```

Description

Use this command to define client to server and server to client network communication ports.

Flags

-a   Use this flag to add definitions for hosts and their respective communication ports. To change existing definitions for a host, specify the new port information with the -p flag. The new information will replace the previously defined information for the specified host. This flag requires the use of the -h and -p flags as well as either the -c or -s flag.

-r   Use this flag to remove definitions for hosts and their respective communication ports. This flag requires the use of the -h and -p flags as well as either the -c or -s flag.

-l   Use this flag to list definitions for hosts and their respective ports. This flag requires the use of either the -c or -s flags.

> **Note:** This will not list client hostnames that have not specifically been configured to use particular network ports. If there is no definition for a client hostname, the default SysBack port determination method is used.

-c   Use this flag to indicate that the actions should be performed for client to server communications. This flag requires the use of either the -a, -r, a or -l flags. These entries are stored in the **/usr/lpp/sysback/.serverfirewallopts** file.

-s   Use this flag to indicate that the actions should be performed for server to client communications. This flag requires the use of either the -a, -r, or -l flags. These entries are stored in the **/usr/lpp/sysback/.clientfirewallopts** file.

-h hostname
Enter the name of the host for which you would like to define specific ports for SysBack to use when contacting it. You may use either the full domain name or just the hostname, as long as the hostname can be resolved by itself.You may also specify the word ALL to indicate that you would like this action to be performed against all defined clients.

-p ″**port numbers**″
Specify the available ports that SysBack should use for communications between the indicated hosts. If you do not use this option, SysBack will use its default method to determine open communication ports. However, should you have the need to direct SysBack to only use certain ports for communications between the indicated hosts, this option must be specified.

Note: Ports must to be specified in one of the following ways:
- As a comma separated list of ports. For example: 1670, 1671

    Note: You must always specify at least two ports. If all of the specified ports are in use at the time that SysBack attempts to use them for communication services, the SysBack process will fail.
- As a range of ports. For example: 1670-1700.

Examples

1. You are logged on to a host named "opal". In order to define ports 1400-1450 to be used by SysBack when attempting to contact the hostname "diamond" as a client:

    sbfirewall -a -c -h diamond -p "1400-1450"

2. You are logged on to a host named "opal". In order to define ports 1500-1550 to be used by SysBack when attempting to contact the hostname "diamond" as a server:

    sbfirewall -a -s -h diamond -p "1500-1550"

3. You are logged on to a host named "diamond". In order to define ports 1600, 1610, and 1620 to be used by SysBack when attempting to contact the hostname "opal" as a client:

    sbfirewall -a -c -h opal -p "1600,1610,1620"

4. You are logged on to a host named "diamond". In order to define ports 1700, 1710, and 1720 to be used by SysBack when attempting to contact the hostname "opal" as a server:

    sbfirewall -a -s -h opal -p "1700,1710,1720"

5. To list all of the client and their defined ports for communications with this host:

    sbfirewall -l -c

6. To list all of the servers and their defined ports for communications with this host:

    sbfirewall -l -s

7. To remove the port definition for the host named opal when opal is acting as a server to this host:

    sbfirewall -r -c -h opal

    Note: Remember, -c means to remove the entry from the client to server firewall options file.

8. To remove the port definition for the host names opal when opal is acting as the client for this host:

    sbfirewall -r -s -h opal

    Note: Remember, -s means to remove the entry from the server to client firewall options file.

Files

/usr/lpp/sysback/.serverfirewallopts

Contains list of hosts and the defined ports configured for client to server communications.

/usr/lpp/sysback/.clientfirewallopts
                  Contains list of host and defined ports configured
                  from server to client communications.

Related Information

The **cfgremsvs**, **cfgremaccess**, and the **cfgremserver** commands.

sbfwd

Purpose

Forward one or more tape devices to a specific image.

Syntax

```
►►──sbfwd──┬──-a──────────┬──-s──"num"──device──────────────────────────────────►◄
           ├──-c──"termdev"─┤
           ├──-v──────────┤
           └──-p──────────┘
```

Description

The **sbfwd** command is used to forward a specified number of images to a tape or tapes written with the **sbwrite** program. **sbfwd** is a low-level command called by the SysBack restore programs when multiple backups are appended to the same media.

If a virtual device was used to perform the backup, you can omit the **-P** and **-a** options when specifying a virtual device name to forward. If a virtual device name was not used, and the backup being read was written with a *parallel* write-policy, specify the **-P** flag and include all devices in the list. If the backup was created with a *sequential* write-policy, you can list multiple device names, and the forwarding continues on the next sequential device when the first one reaches end of volume.

This command should be used only by experienced users who have created backups using the **sbwrite** command outside of the normal SysBack backup process.

Note: You must specify no-rewind tape device names (such as /dev/rmt0.1) with this command. Otherwise, the devices are automatically rewound when the command is complete.

Flags

-a Indicates the device is an auto-loader. You are not prompted to change volumes, but the forwarding continues automatically when the next volume is inserted.

-c "termdev"
If the backup contains multiple tape volumes, the volume prompt is sent to the "termdev" device (such as /dev/tty0).

-v Indicates summary header information should be displayed as each image is read. This gives the header information of the image that is being skipped.

-P

Indicates the backup was performed with a parallel write-policy, so all specified devices should be forwarded synchronously. If not specified, a sequential write-policy is assumed, and only the first device in the list is forwarded unless the end of media is encountered.

-s "num"
Number of images (backups) to skip

Examples

1. To forward devices */dev/rmt0* and */dev/rmt1* in parallel to the third image (skipping 2 images), type:

   ```
   sbfwd -P -s2 rmt0 rmt1
   ```

2. To forward virtual device *vdev0* to the next image, type:

   ```
   sbfwd -s1 vdev0
   ```

3. To forward autoloader device */dev/rmt2* to the fifth image (skipping four images), showing the header on each backup image as it is passed, type:

   ```
   sbfwd -av -s4 rmt2
   ```

Related Information

The **sbread** and **sbwrite** commands

sbread

Purpose

Reads data from all SysBack backup types.

Syntax

```
►►──sbread──┬──────────────┬──device────────────────────────────────►◄
            ├─-a───────────┤
            ├─-c─"device"──┤
            ├─-e───────────┤
            ├─-v───────────┤
            ├─-x───────────┤
            ├─-H───────────┤
            ├─-L───────────┤
            ├─-P───────────┤
            └─-T───────────┘
```
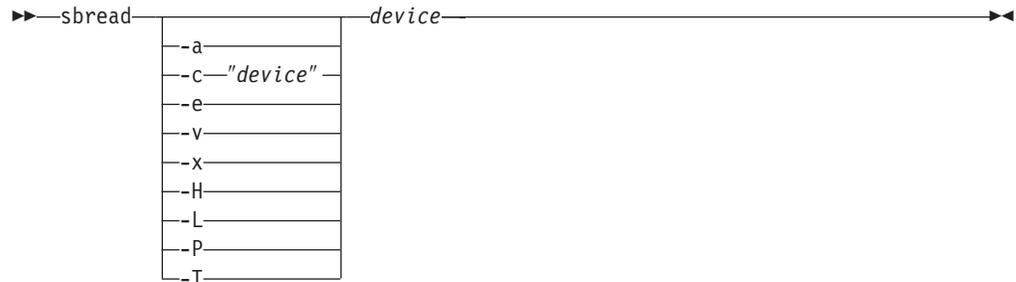
Description

The **sbread** command is used to read a backup that was created using the **sbwrite** command. All SysBack backups are written to the media using **sbwrite**, and all SysBack restore programs use sbread to retrieve the data from the media. In addition, SysBack uses **sbwrite** to store the table of contents (LVM information), file list, and other information identifying the type and contents of the backup. This information can then be retrieved using the **sbread** command.

The *device* parameter can be one or more tape drives, a virtual device, or a dash (-) indicating that the input should be received from standard input (*stdin*).

The **sbread** command reads data only from backup devices or directories to which the local host and user has access, as defined by the **cfglocaccess** or **cfgremaccess** commands. When **sbread** is executed locally, the access permissions are checked in the **.local_access** file. When executed by the **sbclient** command on a remote host, the remote host and user access permissions are checked in the **.remote_access** file.

By default, **sbread** assumes the data was backed up with **sbwrite** using a sequential write policy. If you used a virtual device name to perform the backup, you can use the same virtual device name to read the backup. Otherwise, if you are reading from a backup created with a parallel write policy, you must specify the **-P** flag to the **sbread** command. Also, when reading from a backup made using a parallel write-policy, you must also specify the same number of devices to read the data as was used to create the backup.

SysBack backups, with the exception of the raw logical volume backups, are formatted using either the AIX **backup** or **tar** command. The resulting data is sent to the **sbwrite** program, which stores the data on the media, including the backup header, table of contents (LVM and file system information) and file list, if specified. To read the same backup, it is necessary to use the **sbread** program to read the data from the media and send the results to the AIX **restore** or **tar** program to be unformatted and placed in the AIX file systems.

When you use the **-H**, **-T**, or **-L** options with a no-rewind tape device name, the data is read from the beginning of the backup media and the tape is repositioned at the beginning of the same backup image. By omitting the **-H**, **-L** and **-T** flags, it

is assumed you are to read the actual data from the backup image. You can compress data before writing to the media. If compressed data is written to the media, the data must be uncompressed before it is restored to disk. The SysBack backup programs compress data using **sbcomp** and also indicate to **sbwrite** that the backup is compressed by using the **-p** flag. Before reading a backup with **sbread**, you can query whether the data was compressed by reading the backup header (**sbread -H**). If *Packed: Y* is shown, you should uncompress the data as it is output by **sbread** using the **sbuncomp** program.

If the data you want to read is not contained in the image the tape is currently positioned to, you must use the **sbfwd** command to forward the tape to the correct image before reading.

Flags

-a Indicates the device is an auto-loader. This flag suppresses the volume prompt, requesting that the user change tapes. Instead, a message indicates the tape is unloading and waiting for next volume. The reading continues automatically when the autoloader has inserted the next volume.

-c "termdev"
>If the backup contains multiple tape volumes, the volume prompt is sent to the "termdev" device (such as /dev/tty0).

-e Indicates all devices (if tape) should be rewound upon completion. The default action is to not rewind.

-v Indicates whether status messages should be displayed at the beginning and end of the backup.

-x Displays the progress indicator when reading the data.

-H
>Indicates the header information should be read from the backup. If using a no-rewind tape device, the tape will be repositioned to the beginning of the same image when completed.

-L
>Reads the file list from the backup, if it exists. If using a no-rewind tape device, the tape is repositioned to the beginning of the same image when completed.

-P
>Indicates the backup was performed with a parallel write-policy, so all specified devices should be read synchronously. If not specified, a sequential write-policy is assumed, and only the first device in the list is read unless the end of media is encountered.

-T
>Reads the table of contents (LVM and file system information) from the backup, if it exists. If using a no-rewind tape device, the tape is repositioned to the beginning of the same image when completed.

Examples

1. To read the contents of a compressed sequential backup created using the **sbwrite** command to virtual device vdev1, saving the results in a file called **/tmp/file**, type:

```
sbread vdev1 | sbuncomp > /tmp/file
```

2. To read the header (label) on device */dev/rmt1* and to not rewind after reading, type:

```
sbread -H rmt0
```

3. To read the table of contents from the media, type:

```
sbread -T rmt0 > /tmp/toc.out
```

4. To read the data contained in the parallel backup of */dev/rmt0* and */dev/rmt1*, displaying the progress indicator as the backup is read, and sending the output to the AIX **restore** command to restore the data to the AIX file system, type:

```
sbread -Px rmt0 rmt1 | restore -xvqf-
```

Files

/usr/lpp/sysback/.remote_access

> Contains list of hosts and users that are allowed to execute commands on the local system.

/usr/lpp/sysback/.remote_cmds

> Contains list of commands that can be executed remotely on the local system.

Related Information

The **sbcomp**, **sbuncomp**, **sbfwd** and **sbwrite** commands.

The **cfglocaccess** and **cfgremaccess** commands.

The AIX **backup** and **restore** commands.

sbscript

Purpose

Creates, updates, or removes a shell script containing the commands to execute.

Syntax

```
►►── sbscript ──┬── -o ──┬── -s ─ "scriptname" ──────────────────────────────────►
               ├── -r ──┤                    └─ -D ─ "description" ─┘
               └── -l ──┘

►──┬── Command ─────────────┬──────────────────────────────────────────────◄
   └─ -c ─ "command" ─┘
```
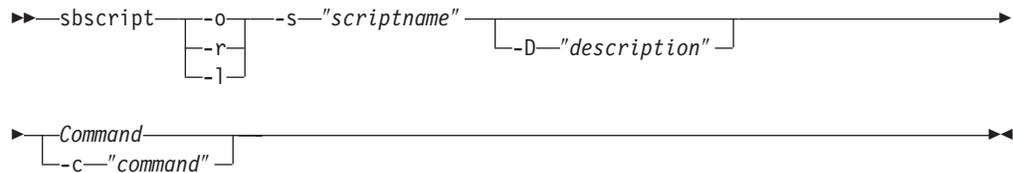
Description

Used to create, update, or remove a shell script containing one or more commands to execute. When creating or updating a script, you can type the command name or specify it using the **-c** flag.

Flags

-o Overwrites existing script name, if it exists.

-r Removes script name, if it exists.

-l Lists currently defined scripts.

-s ″**scriptname**″
Name of the script to create, update, or remove.

-D ″**description**″
Describes the shell script.

Command
Specifies the command or commands contained in the shell script. Separate the commands using spaces.

-c ″**command**″
Specifies the command or commands contained in the shell script. Commands must be inside double quotation marks.

Examples

Use the following syntax to create a shell script called **system_backup** that will be a full system backup:

```
sbscript -s system_backup -D "System Backup -c "sysback -vf /dev/rmt0 sbvg vg01"
```

The following script is created:

```
#!bin/ksh
#
# Description: System Backup
#
sysback –vf /dev/rmt0 sbvg vg02
rc=$?
exit $rc
```

A file in **/usr/lpp/sysback/scripts/.toc_script** is also updated. The format of the file is as follows:

```
Script Name Description
```

The file created from the above example would be as follows:
```
system_backup System Backup
```

To remove the script "wed.backup," type:
```
sbscript -r -s /user/lpp/sysback/sbscripts/wed.backup
```

sbspotcust

Purpose

Installs SysBack into a NIM **SPOT** resource.

Syntax

```
►►──sbspotcust─────────────────────────────────────────────────────────►◄
              ├─d─┬─"devname"─┬─┤
              │   └─"dirname"─┘ │
              ├─l─"lppsource name"─┤
              ├─F──────────────────┤
              ├─n─"spot name"──────┤
              └─q──────────────────┘
```
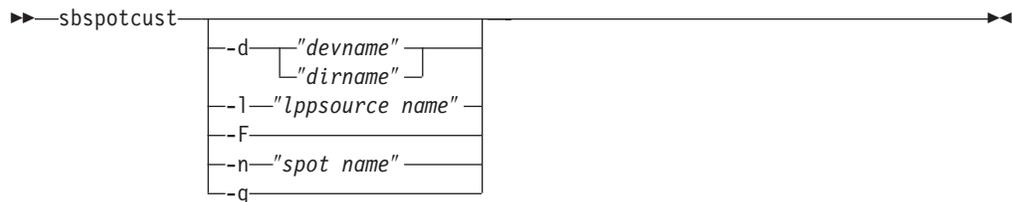
Description

When performing a NIM Resource Network Boot, SysBack must be installed into the NIM **SPOT** resource in order for the SysBack programs to be available during a network boot. The **sbspotcust** command reads the installation filesets from the specified input device or directory, copies them into the specified NIM **LPPSOURCE** directory, and installs them into the NIM **SPOT** from the NIM **LPPSOURCE** directory.

Note: You must run this command before adding a NIM Resource Network Boot client to ensure that the client's boot image contains the SysBack programs.

If you install or update the SysBack filesets contained in the NIM **SPOT** resource after the network boot client is added, you must update the network boot image used by the client using the mksbnetboot command.

Flags

-d "devname | dirname"
Specifies the input device name or directory path and file name that contains the tivoli.tsm.client.sysbackrte fileset.

Note: It is not necessary to install the tivoli.tsm.client.sysback.license.* filesets into the NIM SPOT.

-F Indicates to overwrite the same or newer version of SysBack in the NIM SPOT resource with the version contained on the installation media.

-l "lppsource name"
Specifies the NIM **LPPSOURCE** name to which the filesets will be copied.

-n "spot name"
Specifies the NIM **SPOT** name to which the filesets will be installed.

-q
Checks the specified spot to determine if a valid level of SysBack is installed. The -n flag is required.

Examples

1. To install SysBack to the NIM **SPOT** resource called "spot_433" from the /dev/cd0 device through the NIM **LPPSOURCE** called "lppsource_433", type:

```
sbspotcust -d /dev/cd0 -n spot_433 -l lppsource_433
```
2. To query the level of the spot in spot_433, type:
```
sbspotcust -q -n spot_433
```

Return Codes

0 Successful update of the specified spot

1 Spot does not contain the SysBack filesets.

2 Spot does not contain SysBack filesets.

3 Image location is invalid or does not exist.

4 Invalid spot or lpp_source specification.

5 Update of specified spot failed.

Related Information

The **mksbnetboot** command.

sbtsmdevice

Purpose

This command creates, modifies, or removes a Tivoli Storage Manager virtual device.

```
►►──sbtsmdevice──┬─ -a ─┬──────────────────────────────────────────►◄
                 │  -c  │
                 │  -r  │
                 └─ -l ─┘
```

-a:

```
├───-n "tsmvirdev"──-s "tsmserver"──-p "tsmpassord"─────────────────────┤
```

-c Option:

```
├──┬──-n "tsmvirdev"──┬─────────────────────────────────────────────────┤
   ├──-s "tsmserver"──┤
   └──-p "tsmpassword"─┘
```

-r Option:

```
├───-n "tsmvirdev"──────────────────────────────────────────────────────┤
```

Flags

-a Specifies to add a Tivoli Storage Manager virtual device. This flag requires the use of the -n ″tsmvirdev″, -s ″tsmserver″, and -p ″tsmpasswd″ flags.

-c Specifies to change or modify an existing Tivoli Storage Manager virtual device. This flag requires the use of one or more of the following flags: -n ″tsmvirdev″, -s ″tsmserver″, and -p ″tsmpasswd″

-r Indicates to remove the specified Tivoli Storage Manager virtual device. The flag requires the use of the -n ″tsmvirdev″ flag as well.

-l Indicates to list all existing Tivoli Storage Manager virtual devices. No other flags are valid when this option is specified.

-n ″**tsmvirdev**″

Specifies the Tivoli Storage Manager virtual device name. This flag is required with the -a, and -r flags, and optional for the -c flag.

Note: The device name must be in the form of **tsmX** where "X" is a numeric value.

-s ″**tsmserver**″

Species the Tivoli Storage Manager server name stanza to use for contacting the Tivoli Storage Manager server located in the **/usr/tivoli/tsm/client/api/bin/dsm.sys file**.

-p ″**tsmpasswd**″

Specifies the Tivoli Storage Manager client node's password.

Files

The execution of this command creates the file **/usr/lpp/tsm/dsm.opt.tsm#**.

Related Information

The **sbtsmlist**, **sbtsmnetcfg**, **mkvgback**, **mklvback**, **mkjfsback**, and **mkdirback** commands.

sbtsmlist

Purpose

This flag lists the current Tivoli Storage Manager management class bindings or backups stored in a Tivoli Storage Manager server.

```
►►──sbtsmlist──┬──────┬──┬──────┬──-n──"tsmvirdev"──────────────────►◄
               │  -l  │  │      │
               └  -r  ┘
```

-l:

```
├──┬──-a───────────────┬──────────────────────────────────────────┤
   ├──-o───────────────┤
   ├──-t───────────────┤
   │      ┌──S──┐       │
   │      ├──V──┤       │
   │      ├──L──┤       │
   │      ├──F──┤       │
   │      └──D──┘       │
   ├──-g "backupID"─────┤
   └──-m────────────────┘
```

-r Option:

```
├──-g──"backupID"──────────────────────────────────────────────────┤
```

Flags

-r Indicates to remove the Tivoli Storage Manager backup ID specified with the -g "backupID" flag.

-l Indicates to list either the current Tivoli Storage Manager management class bindings or all backups stored in the Tivoli Storage Manager server as specified with the -n "tsmvirdev" flag. This option will list all active, inactive, and open backups for the backup type specified.

> **Note:** Inactive backup versions are backups that are not the most recent backup for that backup type. There may be multiple inactive versions for each backup type. The number of inactive versions is determined by the backup copy group defined on the Tivoli Storage Manager server. For more information regarding active and inactive backup versioning, please refer to the *IBM Tivoli Storage Manager for AIX: Administrator's Guide* (GC32-0768) and the *IBM Tivoli Storage Manager for AIX: Administrator's Reference* (GC32-0769) .

This flags requires the use of the -n flag. Also specifying the -m flag, or a choice of the -a, -o, and -t flags limits this output according to the function of the flags used. The -g "backupID" flag is not valid with this flag.

-n "tsmvirdev"
Specify the virtual device that represents the connection information for the Tivoli Storage Manager server as configured in the **/usr/tivoli/tsm/client/api/bin/dsm.sys file.**This flag is required.

--g "**backupID**"

Specify the unique object id for the backup stored in the Tivoli Storage Manager server. When specifying this option, the -l a nd -t flags are not valid with this flag.

-m Specify this flag to query the current management class bindings from within SysBack. The management class bindings are obtained from the server name stanza in the **dsm.sys** file that is associated with the specified Tivoli Storage Manager virtual device. If no bindings are specified, the value "default" is returned. This flag is optional.

-a *Active backup versions are the most recent copy of a backup type stored in the Tivoli Storage Manager server. There can be only one active version per backup type.*

-o Open backups represent currently running backup processes, or partial backup images created by an abnormally terminated backup process.

> **Note:** Open backups listed that do not correspond to an actively running backup process should be removed to avoid versioning once the next backup process for that backup type is initiated.

This flag is optional.

-t "**S|V|F|L|D**"

Specify the unique object id for the backup stored in the Tivoli Storage Manager server. When specifying this option, the **List Option** and **Backup Type** are ignored. The possible values for this flag are:

- SB: Full System (Installation Image) backup
- VG: Volume Group level backup
- FS: File System level backup
- LV: Logical Volume level backup
- FD: File / Directory level backup

Related Information

The **sbtsmdevice**, **sbtsmnetcfg**, **mkvgback**, **mklvback**, **mkjfsback**, and **mkdirback** commands.

sbtsmnetcfg

Purpose

This command sets the Tivoli Storage Manager Network Client Install Defaults.

```
►►──sbtsmnetcfg──-h──"host"──┬─ TSM Specific Options ────────┬──────────►◄
                             └─ Other Network Install Options ┘
```

TSM Specific Options:

```
├──┬──-n──"tsm node name"─────────────────────────────────────────────────┤
   ├──-p──"tsm port"────────┤
   ├──-P──"tsm password"────┤
   ├──-a──"tsm admin id"────┤
   └──-I──"tsm backup id"───┘
```

Other Network Install Options:

```
├──┬──-M──prompt|noprompt──────────────────────────────────────────────────┤
   ├──-D──────────────────────────┤
   ├──-c──"console device name"───┤
   ├──-t──"term type"─────────────┤
   ├──-v──"rootvg|all|import"─────┤
   ├──-d──"network device"────────┤
   ├──-g──"gateway IP"────────────┤
   ├──-s──"serverIP"──────────────┤
   ├──-S──"submask"───────────────┤
   ├──-r──"ringspeed"─────────────┤
   ├──-E──"entif"─────────────────┤
   ├──-e──"entcon"────────────────┤
   ├──-R──"y|n"───────────────────┤
   ├──-N──"y|n"───────────────────┤
   ├──-A──"A|M|N"─────────────────┤
   ├──-b──"software install device┤
   ├──-F──"post install script file"─┤
   ├──-l──"LVM information file"───┤
   ├──-o──────────────────────────┤
   ├──-B──"C|Y|N"─────────────────┤
   └──-C──"post first boot install file"─┘
```
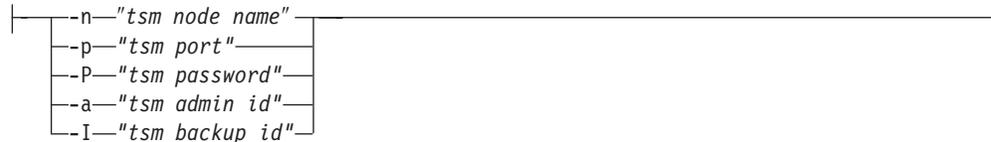
Flags

-h *"hostname"*
> Specify the hostname of the system which was configured as a SysBack network boot client. The value for this field was populated by the input in the previous menu.
>
> **Note:** The SysBack network boot client definition is based on the host name of the client system. This may, or may not be, the same as the Tivoli Storage Manager client node name.
> This flag is required.

-n ″**tsm client node name**″
Specify the Tivoli Storage Manager node name that will be used to connect to the Tivoli Storage Manager server for bare machine recovery. This flag is required.

-a ″**tsm admin ID**″
Specify a TSM Admin ID that has client owner authority when the client node's password is unknown. When specifying a value in the field, you must also specify the Admin's password in the **Password** field rather than the client node password. This flag is optional.

-P ″**tsm password**″
Specify the Tivoli Storage Manager client password that is associated with the **Tivoli Storage Manager Client Node Name** value. If you do not know the password of the client node name, enter the password to administrative id created for this node which has client owner authority. In most cases, this was automatically created when you registered the node to the Tivoli Storage Manager server.

> **Note:** If you do not know either password, you will have to log on to the Tivoli Storage Manager server as an administrator and issue the command: **update node your_nodename new_password**. Then enter that new password into this field.

This flag is optional.

-I ″**tsm backup ID**″
Specify a TSM backup ID to be restored. The backup id is in the form of 0.9527. This flag is optional.

-p ″**tsm port**″
Specify the Tivoli Storage Manager server port number that should be used to connect to the Tivoli Storage Manager server for bare machine recovery. This flag is optional.

-M prompt | noprompt
Specifies whether or not to prompt the client. If this field is set to **noprompt**, the installation menus appear after a network boot. Otherwise, the installation occurs after the network boot without prompting the user, as long as all required information for the user is also provided.

-D
Turns on debug logging operations for troubleshooting network boot and installation problems.

-c "console device name"
To prevent the prompt before installation that determines the console to be used for installation, enter the name of the console here. The console can be either an LFT (graphical display) or TTY (ascii display) device. Examples are "/dev/lft0" or "/dev/tty0". If an LFT device exists on the client, you can select it by typing /dev/console.

> **Note:** You must select a display, even for no-prompt installations, in order to receive error or warning messages and to enable prompts if the default information provided is insufficient.

-t "term type"
If you specified a TTY device, specify a terminal type. This ensure that the installation menus, if required, display with the correct terminal emulation. Examples of common terminal types are "ibm3151", "tvi925", and "vt100".

-v "root | all | import"
Specifies how to handle volume group processing during installation. The available options are:

Recreate and restore rootvg only
Only the rootvg volume group is created and restored from the media, even if other volume groups are defined on the backup. At the end of the installation, rootvg is the only defined volume group.

Recreate and restore all volume groups
All volume groups included on the backup media are created and restored. Volume groups defined on the original system but whose data was not included on the backup, are created but no data is restored.

Recreate and restore rootvg and import all other volume groups from disk
The rootvg volume group is created and restored and all other volume groups are imported from disks on the client. This options assumes that the non-rootvg volume groups already exist on the client. This option is typically used when restoring the rootvg volume group after a system failure where no other volume groups were affected.

-d "network device"
Specify the network device name to use for communications with the Tivoli Storage Manager server. For example: ent0. This flag is optional.

-g "gateway ID"
Specify the gateway address that this client system must go through in order to access the server system. If the client and the server are on the same subnet, it is recommended to re-enter the server's IP address here. This flag is optional.

-s "serverIP"
Specify the IP address that corresponds to the TCPServeraddress for the Tivoli Storage Manager server as defined in the file **/usr/tivoli/tsmserver/bin/dsmserv.opt** on the Tivoli Storage Manager server system. This flag is optional.

-S "submask"
Specify the subnet mask, if required, for the client network interface to contact the installation server. This flag is optional.

-r "ringspeed"
Specify the correct token-ring speed when a token-ring device specified in the **Tivoli Storage Manager Network Device** field. This field is optional.

--E "entif"
Specify either type of ethernet interface when an ethernet device is specified in the **Tivoli Storage Manager Network Device Name** field. For example: IEEE 802.3 This flag is optional.

-e "entcon"
Specify the connection type for the ethernet interface when an ethernet device is specified in the **Tivoli Storage Manager Network Device Name** field. For example: BNC. This flag is optional.

-R "y | n"
Indicates whether or not to remove the SysBack program from the system after installation. Choose "y" for yes when you have not purchased a license for the client that will be installed. The default is "n" or no.

-N "y|n"
Indicates whether or not to remove network specific information required to

configure the host to the network. This option is useful when the machine installed was cloned from a backup image of a machine that is still present on the network. The default is "n" or no.

Note: This option has no effect when cloning images between partitions of the same LPAR Capable machine.

-A ″**A**|**M**|**N**″

This option tells SysBack how much to instal of what is contained in the media in the location specified by the **Install Device** option. The two options are:

M (Minimum)

Selecting this option will install only those device support file sets identified by AIX when the system was booted. This information is obtained from the file **/tmp/devices.pkg**s which is created by AIX when the system was booted. This file is not always 100% accurate regarding what device support is needed as some devices return invalid installp package names rather than individual file sets. In most cases, however, this is a reliable alternative to pre-installing all device support file sets on to a system prior to creating the backup image.

A (ALL)

Selecting this option tells SysBack to perform an install command against every item contained on the media in the specified location. This may include device support file sets or any other software that is located on the media.

N (None)

Do not install any additional device driver support.

- b ″**software install device**″

This option lets you specify a CD-ROM device name, a tape device name, or a NIM **LPPSOURCE** directory name. The NIM **LPPSOURCE** directory name provides additional device support to install during installation. This device support, if available in the specified location, will be installed in circumstances where the needed device support for this machine is contained in the boot image, not the backup image to be installed.

If this is a NIM Resource Network Boot, SysBack will automatically pulls device support from the NIM **LPPSOURCE** specified when the Network Boot client was added regardless of whether this option is edited. For additional information about configuring a NIM Resource Network Boot, please read aboutChapter 15, "Network Boot/Installation Configuration," on page 207.

-F "post install script file"

The fully-qualified path and name of a post-install script to run at the end of installation. The file must exist on the installation server and be readable by any user. For more information about post-install scripts, see Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487.

-l "LVM information file"

The fully-qualified path and name of an LVM information file. The LVM information file must contain information that is compatible with the client. The file must exist on the installation server and be readable by any user. For more information about LVM information files, please refer to the section "Creating or Editing an LVM Information File" on page 293.

-o Overrides the **/etc/SDR_dest_info** file from the boot server. If a system backup image was created on an SP node from a different SP complex, the

/etc/SDR_dest_info file will refer to the wrong control workstation, and post-installation customization will fail. Specifying this options causes the correct file to be copied from the boot server before the **pssp_script** post-install script runs.

-B ″**C|Y|N**″
The "-B" option provides 3 choices: "CLASSIC" , "Y" , and "N". This is an advanced AIX administration concept that should only be manipulated by those familiar with the AIX ODM and the AIX RDA program. The default option is "CLASSIC".

The "CLASSIC" option indicates that SysBack will process device configuration during the system installation process as it has always done prior to the implementation of this option. In the "CLASSIC" scenario, SysBack will merge the ODM device entries that were created and used by the AIX RAMFS during the initial phase of the system installation process, with the ODM stored in the backup image.

The "Y" option indicates that the ODM entries will be recovered only from the backup image. Using this option is sometimes useful in environments where devices have been given AIX names in an order that is different than how the operating system detects those devices on boot. A common example of this is seen in environments that have multiple port RAN devices with hundreds of TTYS attached.

The "N" option indicates that the ODM entries will not be recovered from the backup image. Only those devices that are detected during the system boot process will be configured. These devices will be configured with the default options. Any customized device attributes will be lost.

It is important to note that widely unpredictable results can be seen when using the "Y" and "N" options depending on your system configuration, or if you are cloning, or if you are simply restoring a backup image to the same hardware. Use this option with extreme caution. If you encounter results other than you expected after specifying the "Y" or "N" options, simply perform the system installation process again and let the process default to "CLASSIC".

Tip:

Use the "CLASSIC"option if:
- you are unfamiliar with the AIX ODM and RDA and do not have a specific need to manipulate how the operating system and SysBack detect and configure the
- you are cloning the backup image to a new machine that does not have exactly, 100% the same hardware configuration

Use the "Y" option if:
- you are restoring the backup image on the same machine as where the backup image was created.

Use the "N" option if:
- the state of your devices and their definitions is dramatically inconsistent. Using this option under these circumstances will cause the operating system to only configure physically detectable devices to their defaults. You may then begin redefining your other devices and device attributes from scratch.

-C ″**post first boot install script**″
This script must exist on the system where the system backup was created. It may be located and named as you choose as long as it resides in the root volume group. This script is executed after the all data is restored as a part of

the first reboot process. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well.

Note: If this script is not made executable prior to creating your backup to tape, CD, or DVD, you may still:
- add it to a customized installation diskette as explained in the section:"Creating a Custom Installation Diskette" on page 294.
- define it in the "Changing SysBack CD/DVD Boot Defaults" on page 286, the "Changing SysBack Tape Boot Defaults" on page 281, or by "Setting the Network Install Client Defaults" on page 212.
- define it in the **Post Device Configuration Options** menu explained in "Post Install Configuration Options" on page 197.

Related Information

The **sbtsmdevice**, **sbtsmlist**, **mkvgback**, **mklvback**, **mkjfsback**, and **mkdirback** commands.

sbwrite

Purpose

Writes raw data to backup media.

Syntax

```
►►──sbwrite──┬──-S──┬───┬──────────────────────┬──────device────────────────────►◄
             ├──-P──┤   ├──-a──────────────────┤
             └──-C──┘   ├──-b──"size"──────────┤
                        ├──-B──"backend"───────┤
                        ├──-c──"device"────────┤
                        ├──-d──"description"───┤
                        ├──-e──────────────────┤
                        ├──-i──"file"──────────┤
                        ├──-n──"contents"──────┤
                        ├──-p──────────────────┤
                        ├──-r──user=u|a──host=h|a──┤
                        ├──-R──────────────────┤
                        ├──-s──────────────────┤
                        ├──-t──"type"──────────┤
                        ├──-T──"file"──────────┤
                        ├──-v──────────────────┤
                        └──-x──────────────────┘
```
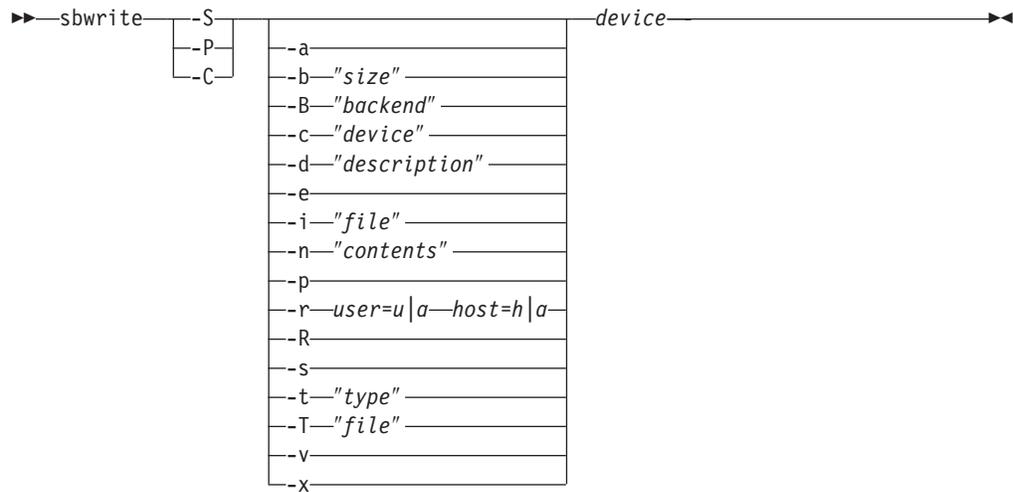
Description

The **sbwrite** command reads data from standard input, adds a backup header, optional file list, and LVM information, and writes to single or multiple devices either sequentially, in parallel, or by creating multiple copies. The device parameter can be either a single tape drive, multiple tape drives, a virtual device, or one or more disk image file names.

This command should be used only by the experienced user who wants to create backups without using the SMIT menus, and who is knowledgeable in the use of the **sbfwd** and **sbread** commands needed to restore data from backups made using this command.

The **sbwrite** command will write data only to backup devices or directories to which the local host and user have access, as defined by the or **cfgremaccess** commands. When **sbwrite** is executed locally, the access permissions are checked in the **.local_access** file. When executed by the **sbclient** command on a remote host, the remote host and user access permissions are checked in the **.remote_access** file.

Any command that produces a data stream to standard output can pipe that data stream to the **sbwrite** command. The **sbwrite** program then stores the data on the media, including the backup header, LVM information, and file list, if specified. The data can later be read from the backup media by the **sbread** program, which can then pipe the data stream to another command.

If the **-i** *file* option is specified, the data is read from the specified file, which can also be a logical volume name (preceded with the /dev prefix), instead of from standard input. If a dash (-) is specified for the output device name, the output is sent to standard output (*stdout*) instead of to a device or file.

Unless you are using a virtual device name for the device parameter, specify either the **-S** flag (indicating sequential backups), the **-P** flag (indicating parallel backups) or **-C** flag (indicating multi-copy backups). Each of the backup types are described in Chapter 23, "Virtual Devices," on page 337.

The other options are used by the SysBack backup commands **mklvback**, **mkjfsback**, **mkdirback**, **mkvgback** and **sysback** to define the contents and format of the data contained in the backup but do not alter the way the data is read using the **sbread** command. For example, the **-t** "type", **-n** "description" and **-d** "description" flags can be used to supply user and backup-specific information that will be stored in the header label on the backup.

The type parameter can be one of the following:

s System backup

p Power system backup

v Volume group backup

L Multi-logical volume backup

F Multi-file system backup

l Single logical volume backup

f Single file system backup

d file/directory backup

o other/unknown. This is the default if none is specified.

The "backend" parameter, specified with the **-B** flag, can be any single character that is used by SysBack to keep track of the format of the data in the data stream. For file system data, SysBack uses either "B" for the AIX **backup** command or "T" for the AIX **tar** command.

Data can be compressed using the **sbcomp** command before sending to the **sbwrite** command. If so, you should specify the **-p** flag to **sbwrite**, indicating that the data on the media is compressed, so you will know later to uncompress the data during a restore.

When **sbwrite** is executed remotely using the **sbclient** command, the hostname and user name of the actual user and host performing the command remotely are written to the backup header. When executed locally, the local user and hostname, if any, are included in the header.

To include a file list on the backup, supply the **-L** flag, followed by the name of the file containing the file list. This same option can be used to store any type of data. To read this data from the backup and display the results to stdout, use the **-L** flag of the **sbread** command. Likewise, to store additional information in the table of contents portion of the backup, use the **-T** flag with the name of the file containing the table of contents data. The table of contents can be read from the backup using the **-T** flag of the **sbread** command.

Flags

-a Indicates the device is an auto-loader. User is not prompted to change volumes, but the reading continues automatically when the next volume is inserted.

-b "size"

Specifies the buffer size in K-bytes (1024-bytes). Changing this value either increases or decreases the amount of data that is written to the output device at one time. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value (64 Kbytes).

-B "backend"

Specifies any single character representing the command used to create the data stream.

-c "termdev"

If the backup contains multiple tape volumes, the volume prompt is sent to the "termdev" device (such as /dev/tty0).

-C

Indicates the backup should be performed with a multi-copy write policy. The same data is written to all specified devices. If used, multiple device names must also be provided.

-d "description"

A custom description to be included in the backup header. Up to 60 characters can be used. This information will be placed in the backup header. If the description includes spaces, the entire description must be enclosed in double quotation marks (").

-e   Indicates all devices (if tape) should be rewound upon completion. The default is to not rewind at end.

-i "file"

Indicates the name of a file or logical volume (with /dev prefix) that contains the data to be written using **sbwrite**. If not specified, **sbwrite** reads the data from standard input.

-l "level"

Specifies a single character representing the incremental backup level. SysBack backups use a digit between 0 and 9.

-L "file"

Indicates the file list, included in the file specified by the "file" parameter, should be included on the backup.

-n "contents"

If supplied, "contents" describes the contents of the backup (such as the volume group name or directory name). Up to 128 characters can be included. This information is placed in the backup header. If contents includes spaces, the entire contents must be enclosed in double quotation marks (").

-p

Indicates the data being sent to **sbwrite** is packed (compressed). This is informational only and does not alter the input data. Specifying the **-p** flag with **sbwrite** causes the "Packed" field in the backup header to show "Y" when reading the header with the **"sbread -H"** command.

-P

Indicates the backup should be performed with a parallel write-policy, so all specified devices should be written to synchronously. If specified, multiple device names must be supplied.

–r host=h|a

Changes the host read permission to the specified value. The possible values

are h, indicating that only the host that owns the file can read it, or a, indicating that any host can read the file. The root user on the server where the file physically resides can also access the file.

–r user=u | a

Changes the user read permission to the specified value. The possible values are u, indicating that only the user that owns the file can read it, or a, indicating that any user can read the file. The root user on the server or the root user on the host that owns the file can also access the file. Note that if any host is allowed to access the file, but only the user that owns the file can read it, the user who owns the file can access it from any host.

-R

Indicates the file list and table of contents file, if any, are to be removed after the command is complete.

-S

Indicates the backup should be performed using a sequential write-policy. In this case, the backup is written to the first device. When full, the next device in the list is used for the second volume. Only when all specified devices are full are you prompted to change the media in all drives. This option should be used by default when only one device name is specified.

-t "type"

Indicates the type of backup being performed. Valid types are **d** (file/directory), **l** (raw logical volume), v (volume group), **0 through 9** (incremental file system *level*) or **o** (other).

-T "file"

Indicates the table of contents, included in the file specified by the "file" parameter, should be included on the backup.

-v Indicates summary header information should be displayed before writing the data. This information is sent to standard error.

-x Indicates the progress indicator should be displayed as the files are being written. If **-x** is used, the command sending the data to **sbwrite** should not update the screen.

Examples

1. To create a backup of all files using the AIX **backup** command, compressing the data with **sbcomp** and formatting the output to 2 parallel *auto-loading* tape drives, *rmt0* and *rmt1*, type:

```
find / -print | backup -ivqf- | sbcomp | sbwrite -aP \
      -td rmt0 rmt1
```

2. To write the file **/home/myfile** sequentially to the virtual device *vdev1*, including a backup description and displaying the progress indicator while writing, type:

```
cat /home/myfile | sbwrite -x -td -n"Transaction log" \
vdev1
```

3. To write the file list contained in the file **/tmp/filelist** to a backup of the **/home** directory, writing multiple copies to drives */dev/rmt1*, */dev/rmt2*, and */dev/rmt3*, type:

```
find /home -print | backup -ivqf- | sbwrite -Cv -td \
  -n"/home" -L/tmp/filelist rmt1 rmt2 rmt3
```

Files

/usr/lpp/sysback/.remote_access
Contains list of hosts and users that are allowed to execute commands on the local system.

/usr/lpp/sysback/.remote_cmds
Contains list of commands that can be remotely executed on the local system.

Related Information

The **sbclient**, **sbcomp**, **sbuncomp**, **sbfwd** and **sbread** commands.

The AIX **backup** command.

sysback

Purpose

Backs up the entire system or specific volume groups for use in a system installation.

Syntax

```
►►─sysback───────────────────────────────────────────────────────►

►──┬──────────────────────┬──────────────────────────────────────►
   │ ┌─-v─┐   ┌─-T─"platform"─┐  ┌──-b─"size"──────────────────┐
   └─┤    ├─-B─┤              ├──┤  -c─"termdev"               │
     └─-x─┘   └─-k─"kernel"───┘  │  -d─"description"           │
                                 │  -e                         │
                                 │  -p                         │
                                 │  -g─"filename"              │
                                 │  -h─"hostname"              │
                                 │  -k─"kernel"                │
                                 │  -i                         │
                                 │  -I─"uniqueID"              │
                                 │  -r─user=u│a─host=h│a       │
                                 │  -M                         │
                                 │  -n                         │
                                 │  -N─"nettype"               │
                                 │  -O                         │
                                 │  -P                         │
                                 │  -T─"platform"              │
                                 │  -U─"host"                  │
                                 │  -X                         │
                                 │  -C─"filename"              │
                                 │  -E─"exclude list filename" │
                                 │  -K                         │
                                 │  -G                         │
                                 │  -J─0│1│2                   │
                                 │  -w─"temporary workspace directory"│
                                 │  -z─"cd/dvd media size"     │
                                 │  -Z─"media space available" │
                                 └──-2─────────────────────────┘

►──-f─"device │ directory │ file"─VGname──────────────────────────►◄
```
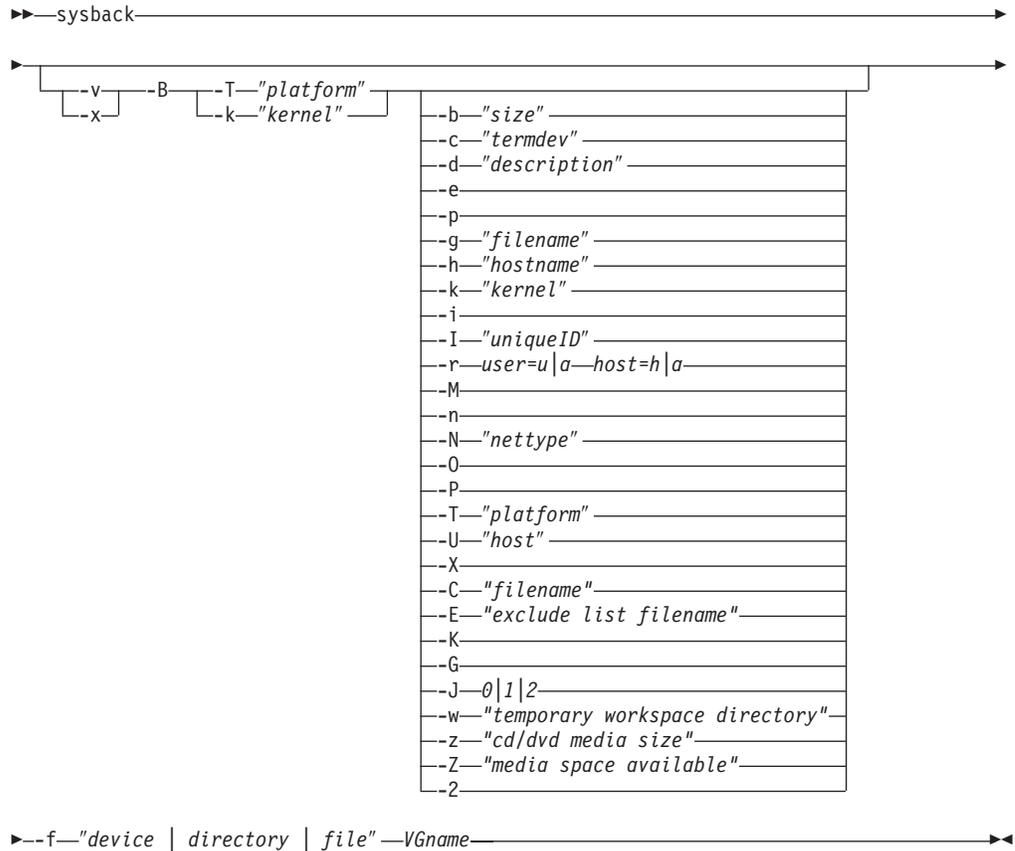
Description

The **sysback** command is used to create a backup of the operating system (rootvg volume group) and optionally other volume groups on the system. This backup can be used to completely reinstall a system to its original state or to install a new system from the customized image. It can also be used to recreate or restore select files, directories, file systems, logical volumes, or volume groups on an already active system. If backing up to a tape device, the tape will be bootable and will include the installation programs needed to install from the customized backup.

The backup can be performed to a tape drive, virtual device, or disk image file. When specifying a disk image file, you can enter the full pathname of the file to create or overwrite. When doing so, the filename must begin with the prefix "SB." to indicate the file is a SysBack system backup. You can also specify only the backup directory and a unique ID. When doing so, a filename will be constructed for you. Refer to "Backups to Disk Image Files" on page 11 for information on the filename created. If you are creating a file and a file by the same name already exists, specify the **-O** option to overwrite the existing file.

The backup can also be performed to a remote device, virtual device, or disk image file. If *Remote Services* has been configured on both the local and server system using the **cfgremsvs** command, and you have defined a backup device on the server for use by this system using the **cfgremaccess** command, then you can also select a hostname using the **-h** option. The backup is then written to the device or filename on the specified server, provided the server has enabled this system access to the specified device or directory.

The backup can also be performed as a "pull" backup to enable central management of backups. The machine that "pulls" the backup is called the "initiator," while the machine that is backed up is called the "backup system." The machine that receives the backup data is called the "destination system."

The initiator is the machine where the mkdirback command is issued. The backup system is referenced in the command syntax by the **-U "host"** flag. The data destination system is referenced by the **-h "host flag".**

When only the **-U "host"** flag is specified, the **-f "device"** flag refers to a device on the initiator system. In this case, the backup destination and the initiator are the same system. This is known as a "two-way pull backup."

When the **-U "host"** and **-h "host"** flags are specified, the **-f "device"** flag refers to a device on the host specified by the **-h "host"** flag. In this case, the backup destination and the initiator are different systems. This is known as a "three-way pull backup."

Remote Services must be configured, using the **cfgremsvs** command, on all of the machines involved in the backup operation, the initiator, the backup system, and the data destination machines. The backup destination machine must have the Server Options of Remote Services configured to allow the backup system machine to send its data to devices on the backup destination machine. You can do this with the **Add or Change Client Host Access to this Server** option or the **cfgremaccess** command.

The backup system machine must have the Client Options of Remote Services configured to specify the backup destination machine as a backup host. You can do this with the **Add or Change List of Remote Backup Servers** option or the **cfgremserver** command.

The backup system must also configure Remote Command Access to allow the initiator machine to pull the backup.

To include network support in the boot images of the tape, specify the **-N** *nettype* option. This enables a network installation to be performed after booting a system from this tape. This flag is valid only when a tape device is used. Valid network types are *ethernet*, *token ring* or *FDDI*. You can also specify a device name (such as */dev/ent0*, */dev/tok0* or */dev/fddi0*) for the nettype parameter.

The **sysback** command calls the **mkvginfo** program to generate information on volume groups, logical volumes, file systems, paging space, and physical volumes. This information can be used later to recreate the system or any of the included volume groups to its original state. The **mkvginfo** command creates a temporary file that is placed in the table of contents on the backup, or you can create a customized file using the **mkvginfo** and **editlvminfo** commands and include it instead on the backup by also specifying the **-g** "filename" option to this

command. Files, or files within directories, that are specified in the exclude list are not backed up with this command. See the **chexcludelist** command for information on creating exclude lists.

Cloning Systems: A System backup created on one machine can be installed on another machine with a different processor, platform type, or other system devices. However, the machine being backed up must have installed all of the device support for the destination platform type, processor type, and other required devices.

If the platform or kernel type differs between the system being backed up and the system that is installed from the backup, the boot image on the tape must be created for use on the destination system. This is accomplished by specifying the **-T** "platform" and **-k** "kernel" options.

The following platform types are currently supported with the **-T** flag:

chrp   Common Hardware Reference Platform

rs6k   "Classic" RISC System/6000 Uni or Multi-processor (AIX 4.2+)

rs6ksmp   Multiprocessor RISC System/6000 (AIX 4.1 only)

rspc   PCI-based (PC) RISC System/6000

The following kernel types are supported with the **-k** flag:

up   Uniprocessor (single processor)

mp   Multiprocessor

Power System Backup: If the **-P** flag is specified, a *power* system backup is created. The power backup differs from the regular system backup in that all file system data is backed up as raw logical volume data. This can increase the performance of the backup and restoration of the data considerably but imposes certain limitations on the system installation and restoration of data from the backup:

- No file system attributes or mount point can be changed during a system installation from this backup.
- The logical volume name, logical volume size, and stripe size attributes of the logical volumes cannot be changed during a system installation from this backup.
- Only entire logical volumes or file systems can be restored from the backup, and only if the logical volume and file system, if applicable, are currently inactive. It is not possible to restore individual files or directories from the backup.
- The entire filesytem is backed up as raw logical volume data. This might result in longer backup and restore time for file systems that were only partially full.

When you create a system backup, **sysback** performs the following functions:

1. Executes the user-created **Pre-backup Script**. Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487 describes how to create this script. This script can perform any function required by the user prior to the backup process.
2. If you are backing up to a tape device, the block size of the tape drive is temporarily changed to 512-byte blocks, if necessary. This ensures that the installation programs are able to read from the media. The block size is changed back to its original value before the volume group files are placed on the media.

3. Generates an LVM information file, using the **mkvginfo** command, that will contain the information for all volume groups, logical volumes, and file systems. This file is used by the installation process to regenerate the same volume group configuration. This step is ignored if the **-g** "filename" option was specified.

4. Places boot image and installation programs on the tape in separate images. This enables the installation process to be accessed by booting from the tape. This step is ignored if the backup media is not a tape.

5. The data for each file system and logical volume is written to the backup media, each in a separate backup image.

6. Executes the user-created **Post-backup Script**. This script can perform any functions required by the user after the completion of the backup, but prior to the rewinding and verifying of the backup format. Appendix D, "Creating Scripts for Customizing the System Backup and Install Process," on page 487 provides information on creating this script.

Flags

-v   Lists the files as they are backed up. This flag cannot be used with the **-x** flag.

-x   Displays the progress indicator as the backup is being performed for each volume group. This flag cannot be used with the **-v** flag.

-b "size"
   Specifies the buffer size in K-bytes (1024-bytes). Changing this value either increases or decreases the amount of data that is written to the output device at one time. Some devices with small buffers might require you to reduce this value, while other devices with very large buffers can benefit from increased performance by increasing this value. If you are unsure, use the default value (64 Kbytes). The value specified must be a multiple of the tape block size.

-B
   Indicates that only boot images are to be created on the tape. This flag is invalid unless a tape device is specified. When this flag is used, all other options, with the exception of the device name and platform type, are ignored.

-T "platform"
   When writing to tape, specifies the platform type for which the boot image will be created. The default is to create boot images for the current platform type.

-k "kernel"
   When backing up to tape, indicates the kernel type of the machine that will be booting from the tape. The default is to create a bootable tape for the current kernel type.

-c "termdev"
   If the backup contains multiple tape volumes, the volume prompt is sent to the "termdev" device (such as /dev/tty0).

-d "description"
   A custom description to be included in the backup header. Up to 60 characters can be used. This information will be placed in the backup header. If the description includes spaces, the entire description must be enclosed in double quotation marks (").

-e   Forwards to the end of the last SysBack backup on the tape. Used when stacking backup images on the same tape.

-f "device | file | directory"
Specifies the output device name, filename, or directory for the backup. The specified output option can be on the local system or server (if **-h** option provided). The device name can be a tape drive or virtual device name. If a directory is specified, you must also specify an ID using the **-I** flag.

-g "filename"
Indicates the name of a LVM information file previously created and customized for this backup. Refer to the **mkvginfo** and **editlvminfo** commands.

-h "hostname"
Name of the remote backup server host to receive the backup data (such as the data destination host). This is the host that provides the backup device specified by the **-f** flag.

-i Indicates to dynamically create a backup file IDD when writing backups to a disk image file. This flag supersedes the **-I**"ID" flag and is useful when scheduling a backup to disk image file.

-I "ID"
This option is used only if a directory is specified as the output device. The ID is included in the filename created to make it unique from other disk image file backups. If a backup in the same directory with this ID already exists, specify the **-O** flag to overwrite the previous backup.

-M
Retains physical partition mapping, by default, when logical volumes are recreated from this backup. Unless the logical volumes were originally created using physical partition maps, it is generally recommended that they not be recreated using the same partitions, as this would preserve fragmentation that develops over time as logical volumes and file systems are expanded. You can specify whether or not partition mapping is used before the logical volumes are recreated.

-n
Indicates that the backup is to be placed at the current tape location without rewinding the tape. Only if the tape is positioned at the start of tape are boot images placed on the tape. If the tape is *not* positioned at the start of the tape, the backup is appended to the prior backup and can later be restored from by entering a *backup sequence number* with the **sysrestore** command.

-N "nettype"
Specifies that device support for the indicated network type should be included on the tape boot images.

-O
Indicates that, if a filename was specified as the output device, and the filename already exists, that the new backup will overwrite the previous file.

-p
Indicates that the data should be packed before being written to the media. This typically reduces size of backup between 25% and 40%. For increased performance, do not use this option when backing up to a device that provides hardware data compression.

–r host=h|a
Changes the host read permission to the specified value. The possible values are h, indicating that only the host that owns the file can read it, or a, indicating that any host can read the file. The root user on the server where the file physically resides can also access the file.

–r user=u|a
Changes the user read permission to the specified value. The possible values are u, indicating that only the user that owns the file can read it, or a, indicating that any user can read the file. The root user on the server or the root user on the host that owns the file can also access the file. Note that if any host is allowed to access the file, but only the user that owns the file can read it, the user who owns the file can access it from any host.

-U "host"
Name of the host to be backed up (such as the backup system).

-X
Excludes all non-JFS (journaled file system) logical volumes, or "raw" logical volumes, from the backup.

-C filename
Specify the fully qualified path and filename to a file that contains a list of the items that you would like to back up.

This option is required when you attempting to specify entities that can not be displayed on the current display screen such as when using an ASCII terminal.

This option may also be used when the path and filenames of the backup objects are so long that the command length plus the backup object specification length exceed the 255 character limitation for the AIX command line.

In all other cases, use of this option is not required as the specification of non-rootvg volume groups is indicated by "vgname".

When specifying a file list, the file must be formatted such that each line of the file includes the fully qualified path of one file, directory, logical volume, file system, or volume group name.

Note: This use of wild cards in this list is not supported.

-E "exclude list filename"
Specify the fully qualified path and file name to use as the exclude list. If this field is left blank, the backup will look for the default exclude list located at: **/usr/lpp/sysback/.exclude_list**. If the default exclude list does not exist or is null, nothing will be excluded from the backup specifications.

-K Use this option to indicate that you would like the atime and mtime values of your files to be returned to their pre-backup values once the backup is completed. The atime and mtime of each file will be stored in a temporary file during the backup process. If the backup completes successfully or with soft failures" rc=0 or rc=1", a process will be automatically started after the reset these values immediately following the backup.

> **Note:** The atime and mtime values are collected at the start of backup processing immediately prior to backing up the files. If the atime or mtime of a file is modified during the backup process, the original atime and mtime values stored by the backup preprocessing will be restored at the end of the backup.

> **Note:** Invoking this option will increase the amount of time that it takes for the backup process to execute.

-G Use this option to indicate that any write protected tapes encountered during the backup process should be ejected.

Note: If a write protected tape is encountered at the start of the backup, or at time during the backup when the process attempts to span to new media, an appropriate message will be displayed indicating this condition. If you are using an autoloading tape library, the library should automatically insert the next sequential tape in the media changer once a tape eject occurs. If no write enabled tape is inserted into the drive after a write protected tape is ejected, the backup process will wait indefinitely for a write enabled tape to be loaded.

-J 0|1|2

Use this option to define the conditions under which the tape should be ejected at the end of the backup process. The choices are:

0   "SUCCESS:" This option will only eject the tape if the backup completes successfully with a return code of zero.

1   "WARNING:" This option will only eject the tape if the backup completes successfully with a return code of zero or with soft errors and a return code of one.

2   "FAILURE:" This option will eject the tape at the end of the backup even when the backup ends with hard errors and return code two. Therefore, the tape will be ejected under all conditions.

-w ″**temporary workspace**″

Specify the fully qualified directory name of the location where you would like SysBack to create its temporary work files during this process. Work files created directly by SysBack programs will be generated in the specified location. Any AIX commands that SysBack may call will be unaffected by this option. If no directory is specified, the default work space location is **/tmp**.

-z ″**cd/dvd media size**″

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size of the CD/DVD media in megabytes. If a backup image exceeds this length, it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs that number appended. In the case of double sided media, you should only specify the size of one side of the media, not the total aggregate size. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** option.

-Z ″**media space available**

This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. Specify the total size left on current CD DVD media in megabytes. This value is used only when creating the first CD/DVD image on CD 1. It is the total size left after creating the boot images, adding the device filesets and populating the CD file system with all of the system files required on a system boot. If you are not sure what the exact value is for your environment, you may use the **CD/DVD Media Size** size less 125MB as this would accommodate the majority of environments for the size of all the items listed above. For example, if you had:

- 50 MB for device support filesets if added

- 25 MB for MCA boot image

- 25 MB for RSPC boot image

- 25 MB for CHRP boot image

The total is 125MB. If you wanted to create a boot CD to support RSPC and CHRP systems, and include needed device support, you would need to subtract 100MB from the **CD/DVD Media Size** size and use that value here. If no value is specified, the default value is 125. If a backup image exceeds this length it will be split. Each image that is split will have a number appended to the Backup file image name. For example: If the backup file SB.sysback1.hd2 needs to be split, another file called SB.sysback1.hd2.2 would then be created automatically. Each time another split occurs, that number appended at the end would then be increased by one. This is a required option when the backup device is a directory and this backup image will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **CD/DVD Media Size** option.

-2 This is a required option when the backup device is a directory and this backup will later be burned to CD/DVD. The option does not apply to backups to tape or Tivoli Storage Manager virtual devices. Using this option also requires the use of the **Media Available Space** and **CD/DVD Media Size** options.

Examples

1. To generate a backup of the root volume group only, to the tape drive */dev/rmt0*, displaying the progress indicator, type:

   ```
   sysback -nxf rmt0
   ```

   Because the **-n** option is specified, the tape needs to be rewound. If the tape is already at the start of media, the resulting backup will be on a bootable tape. If not, the backup will be appended to the prior data.

2. To generate a backup of the root volume group and the *uservg* and *datavg* volume groups, using virtual device *vdev2*, and making the backup bootable on a multiprocessor RSPC machine, enter:

   ```
   sysback -f vdev2 -T rspc -k mp uservg datavg
   ```

3. To generate a compressed (packed) backup of the *rootvg* and *uservg* volume groups to the disk image file **/usr/lpp/sysback/images/all/SB.venus.04281007** on host *mars*, listing files as they are backed up, enter:

   ```
   sysback -pvh mars -f \
           /usr/lpp/sysback/images/all/SB.venus.04281007 uservg
   ```

4. To initiate a pull backup of the /home file system on host *lasher*, from host *sysback1*, and send the data to rmt1 of the host *sysback1*, type the following from *sysback1*:

   ```
   sysback -U lasher -f /dev/rmt1 /home
   ```

5. To initiate a pull backup of the /home file system on host *lasher*, from host *sysback1*, and send the datat to rmt1 of the host *shappy*, type the following command from *sysback1*:

   ```
   sysback -U lasher -h shappy -f /dev/rmt1 /home
   ```

Related Information

The **mkvginfo**, **cfgremsvs**, **cfgremaccess**,**cfgremrootaccess**, and **chexcludelist** commands.

sysrestore

Purpose

Restores or verifies data on any SysBack backup or lists backup type or contents.

Syntax

```
►►──sysrestore──-f──"device or file" ─────────────────────────────────────►

  ►─┬────────────────────────────────────────┬─┬────┬──-t─┬──-D─┬──data──►◄
    ├──-c──"termdev" ────────────────────────┤ ├─-v─┤     ├──-F─┤
    ├──-D──"destination" ────────────────────┤ └─-x─┘     ├──-L─┤
    ├──-d──"destination directory file list"─┤           ├──-R─┤
    ├──-F────────────────────────────────────┤           ├──-V─┤
    ├──-h──"hostname" ───────────────────────┤           ├──-f─┤
    ├──-s──"sequence" ───────────────────────┤           └──-l─┘
    ├──-L────────────────────────────────────┤
    ├──-n────────────────────────────────────┤
    ├──-T────────────────────────────────────┤
    ├──-v────────────────────────────────────┤
    ├──-y────────────────────────────────────┤
    ├──-P──"Aaotc" ──────────────────────────┤
    └──-z──"file list and path" ─────────────┘
```
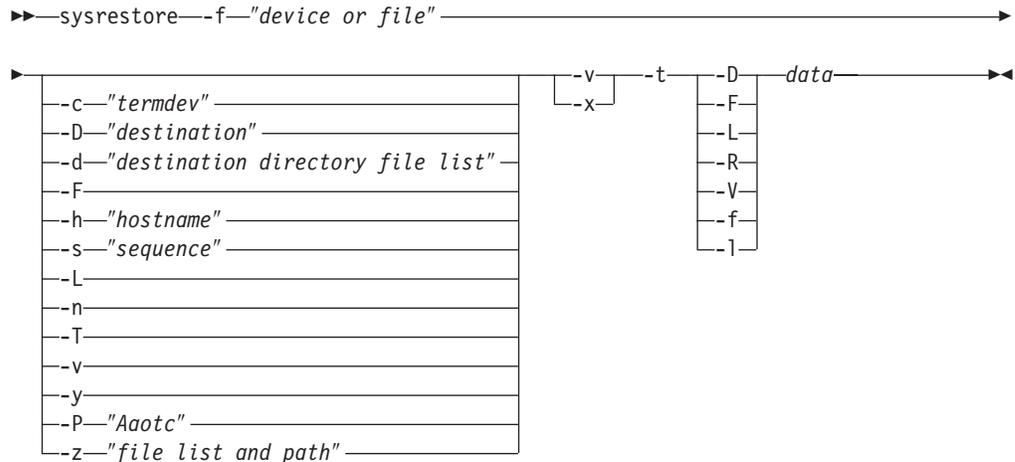
Description

The **sysrestore** command is used to either verify or restore data from any type of backup created with SysBack. This command can also be used to list the backup type or the contents of the backup.

The command can be performed from a remote device, virtual device, or disk image file. If *Remote Services* has been configured on both the local and server system using the **cfgremsvs** command, and you have defined a backup device on the server for use by this system using the **cfgremaccess** command, then you can also select a hostname using the **-h** option. The command can then access devices or files on the server, provided the server has enabled this system access to the specified device or directory.

When specifying a local or remote filename, do not include the file extension (*.TOC* or.*lvname*) added by the SysBack **backup** command. The **sysrestore** command automatically reads the specified data from the file or files with the appropriate extension.

Different types of data can be verified or restored from different types of backups:

Backup type	Verify/Restore types
System backup	volume groups, file systems, logical volumes, directories, files
Power backup	volume groups, file systems, logical volumes
Filesystem	file systems, directories, files
Logical volume	logical volumes
File/Directory	directories, files

When restoring a volume group, all logical volume and file system data within the volume group is restored. When restoring directories, all files within the directories are restored as well, even if the files are contained in different file systems.

The *data* argument can be a list of either volume groups, file systems, logical volumes, directories, or files, depending on the type of data to be listed, verified, or restored (as indicated by the **-t** flag).

The **-t** option must be specified to indicate the type of data to verify or restore. For instance, a volume group backup can contain multiple volume groups, file systems, and raw logical volumes. To restore two specific file systems from the backup, you must specify the **-tF** option, and the data argument at the end of the backup must contain the mount points of the file systems to restore. To restore only a specific directory from a backup, regardless of the backup type, you must specify the **-tD** option, and the *data* argument must be the directory or directories to restore.

To verify the backup by reading the data, specify the **-V** flag. When specified, the data on the backup is read but no data is restored. You still need to specify the type and data you want to verify. For example, to verify only a couple of raw logical volumes on a volume group backup, specify the **-V** flag, the **-tL** option, and the names of the logical volumes to verify as the data argument. To verify the entire contents of a System backup, you must specify the **-V** flag, the **-tV** flag, and the names of all volume groups to verify.

The **-L** flag is used to list the contents of the backup, depending on the type specified with the **-t** flag. The following table indicates the data list that is created with the **-L** flag, based on the type:

type (-t)	Produces list of:
V	Volume groups
L	Logical volumes
F	File systems
D	Directories
R	Regular files
f	Directories and regular files
l	File systems and logical volumes

The **-T** flag queries the type of backup and returns a single character as follows:

S	System backup
P	Power system backup
V	Volume group backup
F	File system backup
L	Logical volume backup
D	File/directory Backup

The **-i** "sequence" option is used to specify which backup to verify or restore when multiple backups are stacked onto the same tape or series of tapes. If this flag is specified, and the value is greater than 1, the tape or tapes will be automatically forwarded to the beginning of the desired backup before verifying or restoring data.

The **-F** flag must be specified to allow restoration of system directories or files that are not ordinarily replaceable. Restoring files to these directories can have adverse affect on the system or even cause a system failure, and should be used with extreme caution. Those directories are:

- **/**
- **/dev**
- **/etc/vg**
- **/etc/objrepos**
- **/usr**
- **/usr/lib**
- **/usr/lib/objrepos**

Specifying a new destination: The **-D** "destination" option indicates that the data should be restored to the new destination.

When you restore from a file/directory backup, the files or directories will be restored relative to the specified destination but will include the full path of the original files. For instance, if a file **/home/tony/file1** is restored to destination **/tmp**, the resulting file would be **/tmp/home/tony/file1**.

When you restore from a system, volume group or file system backup, the files are restored to the destination directory, but the filename does not contain the prior mount point of the file system. For instance, if files are restored from the /home file system to the **/tmp** destination, a file previously called **/home/tony/file1** will be restored as **/tmp/tony/file1**.

To restore logical volume data to a new location, specify a new logical volume name. The specified logical volume name cannot be currently active.

Incremental Restores: The **-y** flag must be specified to enable restoration of incremental data. To restore the entire contents of an incremental backup, this flag must be specified. The resulting file systems will contain the same files as it did at the time the backup was created. This can, in some cases, require files to be re-removed from the file system that were deleted prior to the incremental backup level being performed.

If the **-y** flag is not specified, you can restore only select files and directories from an incremental backup. Refer to "Understanding Incremental Backups" on page 19 for important details on restoring data incrementally.

Notes:

1. This command is not intended for restoring an entire AIX operating system. The only way to restore the entire system is to reinstall from the system backup. Refer to Chapter 14, "System Installation and Maintenance," on page 185.

2. When specifying the files to restore, SysBack supports the use of BRE (Basic Regular Expression) wild cards to restore a wildcard match of files. The files and the wildcard must be enclosed in double quotation marks (") to avoid expansion by the user's shell. For example, "/home/j*" would indicate to restore all directories and files that start with /home/j such as **/home/john** or **/home/jenn**.

Flags

-c "termdev"
    If the backup contains multiple tape volumes, the volume prompt is sent to the

"termdev" device (such as /dev/tty0). If the **-h** hostname option is specified, this flag indicates the device on the remote host.

-D "destination"
Indicates that files should be restored to the directory specified by the "destination" parameter or the logical volume data should be restored to the logical volume specified by the "destination" parameter, rather than to their original locations. Using this option sets the destination globally for all data being restored.

> **Note:** You can specify multiple destinations for multiple logical volumes, volume groups, or file systems to restore only when using the **Destination Directory Filelist** option.

-d ″**destination directory filelist**″
This flag will overwrite the default destination directory and / or the value set by the **Destination (if different)** option. Rules for file list formatting:
- Entries with spaces or special characters in the name must be double quoted.
- For full system, volume group, and file system level backups:
  - You may only specify one unique destination directory per file system and / or file system contents.
  - File or directory file list entries that exist in the same file system can only be restored to the same unique destination directory.
  - File or directory file list entries that exist in different file systems can be restored to as many unique destination directories provided that they conform to the above rules as well.
- For logical volume level backups:
  - You may only specify one unique destination directory per logical volume.
- For file or directory level backups:
  - You may only specify one unique destination directory per backup image.

This option is used in conjunction with the **File Containing a List of Data to be Restored** option which is a single column file list. e.g. You may only specify a list of items to restore. However, by adding this **Destination Directory Filelist** you may specify a two column restore file list. e.g. first column specifies the data to restore and the second column specifies the new destination for the data in the first column.

The order of priority for processing destination locations is:
1. The location defined for the data in the **Destination Directory Filelist**. If there are data entities to restore that are not included in an entry defined in this file list, SysBack checks for the existence of a setting in the **Destination (if different)** option.
2. The location defined by the **Destination (if different)** option. This is a globally applied option and is only over ridden by an entry for the data entity in the **Destination Directory Filelist**.
3. If the **Destination (if different)** option is not set and data entity to restore is not included in an entry for a data entity in the **Destination Directory Filelist**, then the default location of the data is used.

-f "device or file"
Specifies the input device name or filename of the backup. The specified option can be on the local system or on a backup server (if **-h** option provided). The device name can be a tape drive or virtual device name.

-F   Enables the restoration of system files or directories otherwise non-replaceable.

-h "hostname"
   Hostname of backup server to which the remote backup device is attached.

-H
   Creates a detailed usage listing on the screen for this command. When specified, no other action will be performed.

-i "sequence"
   Specifies the backup to list, verify, or restore on a tape or series of tapes containing multiple (stacked) backups. The default is "1", or the first backup on the media.

-L
   This flag causes the command to read and display the items on the backup of the specified type (indicated by the **-t** flag).

-n
   Indicates the tape is already positioned at the beginning of the backup to read. When this flag is supplied, the **-i** sequence option is ignored.

-t "type"
   Indicates the type of data to be listed, verified, or restored.

-T
   Reads the backup header and displays a single character representing the backup type. No other action is performed.

-v   Displays the file names as they are either verified or restored. This flag has no affect when verifying or restoring logical volumes. Do not specify this flag if the **-x** flag is used.

-V
   Indicates that the backup contents should be verified, rather than restored. Only items of the specified type (indicated by the **-t** flag) are verified.

-x   Displays the progress indicator, including the approximate size and time to read the entire contents of the media and the amount completed. Do not specify this flag if the **-v** flag is used.

-y   Indicates that an incremental restore can be performed. This flag is required if the backup is an incremental backup and restoring other than specific files or directories.

-P "Aaotc"
   This flag only restore the attributes of the file that you specify and does not restore the file contents. If the file specified does not exist in the target path, the file is not created and a warning message will be issued. This option restores file attributes selectively depending on the options specified in the string parameter. You may specify any combination of the following as the string parameter:
   - A: restores all attributes
   - a: restores only the permissions of the files / directories
   - o: restores only the ownership of the files / directories
   - t: restores only the timestamp of the files / directories
   - c: restores on the ACL attributes of the files / directories

   Note: WARNING: Usage of this option will overwrite the attributes of the files owned by another user when used by the root superuser.

-z "file list and path"
>Specify the fully qualified path name to a file that contains the list of files to be restored from this backup image. Use this option when restoring large numbers of files.

>**Note:** The file list structure should be such that there is only one entry per line in the file. For example:

>```
>/tmp/myjunk
>/home/*
>/home/my file name that has spaces in it
>/home/my file name with special %&* characters in it
>```

>This is the only way that SysBack can selectively restore files with spaces or characters that have special meaning to the shell. Also, wildcard restores will correctly restore files and directories that contain spaces or special characters in the name.

>For example:

>```
>/myfs/mydirectory/*
>```

>A wildcard restore specification such as this could restore files and directories like:

>```
>/myfs/mydirectory/ my file name
>/myfs/mydirectory/my sub d&rectory/ spec#$@l file
>/yourfs/*
>```

>A wildcard restore specification such as this could restore files and directories like:

>```
>/yourfs/speci@l name/dir/dir
>/yourfs/dir name/file@ special
>```

Return Codes

The **sysrestore** command returns a value, which can be queried with the $? shell variable, indicating the success or failure of the process as follows:

0   The process was completely successful.

1   The process terminated due to an unknown error.

2   The process terminated because there was an error writing the backup data to disk.

3   There were read errors when reading the backup data from the backup media. The failure resulted in loss of some data and possibly termination of the restore, depending on the number of read errors and how SysBack is configured to handle them.

4   There were sync errors when reading the backup data from the backup media. The failure resulted in loss of some data and possibly termination of the restore, depending on the number of sync errors and how SysBack is configured to handle them.

5   The process completed successfully, however there were non-fatal errors when writing one or more files to disk.

Examples

1. To restore the **/tmp** directory and its contents from the disk image backup **/usr/lpp/sysback/bf/VG.localhost.06230300**, displaying the progress indicator instead of the file list as the files are read, type:

    ```
    sysrestore -x -tD \
      -f/usr/lpp/sysback/bf/VG.localhost.06230300 /tmp
    ```

2. To restore the files **/data/file1** and **/data/file2** from a backup on virtual device *vdev1*, type:

    ```
    sysrestore -tR -fvdev1 /data/file1 /data/file2
    ```

3. To list all files and directories included in the backup on device */dev/rmt0* attached to host *neptune*, enter:

    ```
    sysrestore -L -tf -h neptune -f rmt0
    ```

4. To show the names of all logical volumes and file systems included on the backup on tape device */dev/rmt1*, type:

    ```
    sysrestore -L -tl -frmt1
    ```

1. To verify the uservg volume group on the backup on device */dev/rmt0*, showing the files as they are read, type:

    ```
    sysrestore -Vv -tV -f rmt0 uservg
    ```

2. To determine the backup type of the second backup on the tape, type:

    ```
    sysrestore -T -f rmt0 -i2
    ```

Related Information

The **sysback**, **mkdirback**, **mklvback**, **mkjfsback** and **mkvgback** commands.

Appendix B. Functional Requirements & Limitations for DBCS and Bi-Di Environments

SysBack supports all operating system locales. However, Double-byte character set (DBCS), Bi-directional (Bi-Di), and certain Single-byte character set (SBCS) script type languages (such as Thai) have some unique differences and limitations in relation to the product's functionality. Below is a list of considerations that should be reviewed when implementing SysBack in DBCS or Bi-Di environments.

- In order to backup file systems, logical volumes, directories, or files with DBCS or Bi-Di characters in the name, you must use the corresponding DBCS locale setting when initiating the backup. For example, if there are DBCS file names created using the Ja_JP locale, you must have that locale setting as the primary locale for your system or run the command: export LANG=Ja_JP before the backup

- When specifying a volume group, file system, logical volume, directory, or file containing DBCS or Bi-Di characters in the name as the backup object for remote backups via the command line, you must place this object into a file list instead. Then, specify the file list to the backup command with the appropriate "file list" option or flag. Specify only one object per line in the file. Backup objects that do not contain DBCS or Bi-Di characters in the name of the object, but have subdirectories or files containing DBCS or Bi-Di characters are not affected by the requirement.

- When specifying a volume group, file system, logical volume, directory, or file containing DBCS or Bi-Di characters in the name for a remote restore via the command line, you must place this object into a file list instead. Then, specify the file list to the restore command with the appropriate "file list" option or flag. As an alternative, you may initiate the restore process via graphical SMIT and simply pick the restore object from the SMIT selector.

  Note: SMIT has a 32mb limitation for the display of data. If you indicate to display a list data for restore and that list exceeds 32mb, SMIT will generate an error. In this situation, you must use the file list option.

- When recreating AIX LVM structures that contain language specific characters, the locale setting on the system must be the same as the locale setting that was used when the backup was created.

- When specifying AIX LVM structures that have DBCS or Bi-Di characters in the name in order to recreate them from a backup image, you must use graphical smit to display a list of objects that may be recreated.

  Note: In situations where graphical SMIT is not available, or you are performing the recreate process remotely, you may use this work around:
  1. Create a file that indicates the AIX LVM entity to recreate and save the file.
  2. Issue the either the command: usr/sbin/remakevg -f /dev/rmt0 -v `cat your_filename` or the command: remakevg -f /dev/rmt0 -h remote_host -v `cat your_filename`

- DBCS, Bi-Di, and SBCS script type languages (such as Thai) will not display properly when using ASCII terminals as your console. This is a limitation of the AIX operating system and that type of hardware.

- When restoring data that has DBCS or Bi-Di characters in the directory or file names, the locale setting on the system must be the same as the locale setting that was used when the backup was created. For cross language restores, simply run the command: export LANG=locale_of_backup
- The AIX operating system does not properly display DBCS or Bi-Di characters in "service mode". A system installation occurs in "service mode". For this reason, you may not be able to determine which AIX LVM entities that you want to select for editing purposes. Although you will be able to edit any AIX LVM entity, you probably will not know which one to select from the list because AIX will present the DBCS or Bi-Di characters incorrectly.

  You can work around this problem in one of two ways:

  Option A:

  1. Set the "boot defaults" to "ignore" all non-rootvg volumes groups during installation.
  2. Create your backup image
  3. Reinstall the system (the above will ensure that only rootvg is created)

     Note: rootvg normally does not have AIX LVM entities with DBCS or Bi-Di characters.

  4. Once the system is running in "normal mode" recreate and edit any non-rootvg volume groups using graphical SMIT.

     Note: A drawback to this approach may be that you must set the "boot defaults" before the backup is created when using a tape or CD/DVD device. If you do not preset these defaults, then you will have to create "boot only" media at the time of installation. If you set the defaults before creating the "boot only" media, you will be able to boot from the "boot only" media and then restore from the original backup image. This approach will yield the same effect as setting the "boot defaults" before the backup

  Option B:

  1. Reinstall the system (all rootvg and non-rootvg volume groups will be recreated and restored).

     Note: rootvg normally does not have AIX LVM entities with DBCS or Bi-Di characters.

  2. Once the system is running in "normal mode", vary off and export the volume groups that you need to recreate or edit.
  3. Use graphical SMIT to recreate or edit any volume group containing AIX LVM entities containing DBCS or Bi-Di characters.

     Note: The drawback to this approach may be that you have to take the time to restore all of the non-rootvg volume groups during the system installation and to restore them again once you complete the changes in "normal mode".

- It is possible to have a backup and restore environment that has a mix of locale settings. For example, you could have a remote SysBack server using a German locale setting, and a SysBack client using a Ja_JP locale setting. When on the Ja_JP client, if you use the SMIT interface, dates will display based on the JA_JP locale setting. The backup data sent to the server using the German locale will be stored preserving the Ja_JP cultural preferences. If you should try to list the contents of the backup created by the Ja_JP system on the German system, you will see the date formatting in Ja_JP for that set of data. However, to list the

contents of this backup image, you should set your locale on the German system to Ja_JP to match the backup. Doing this will avoid the potential to see file names that do not display correctly. You can set the locale to Ja_JP by issuing the command: export LANG=Ja_JP before displaying the backup contents.

Appendix C. LEDS

This chapter contains a list of the system LED codes that might appear when you boot or install from a SysBack System Backup. Many of the LED codes are for information only and usually occur when there is no system console available; others indicate an error in the boot or installation process.

Many of the LED codes appear only during a *no-prompt installation*. This is because there may not be a system console attached and the LED is used to provide information to the user on the progress of the installation, or because an error occurred that requires user intervention.

The LED codes below are those that are provided by SysBack. Any other codes that appear are not part of the SysBack product but normally represent a system software or hardware problem. If the LED code is not listed here, refer to your AIX software diagnostics documentation for details.

000   **Failed to identify the system type during a tape boot**

The *bootinfo -B* command failed due to device support missing from the boot image that is required to support the client system's hardware. The problem usually is caused by missing SCSI device support. You need to recreate the boot tape from a system containing all device support required for the system to be installed.

c04   **An unrecoverable error occurred during a no-prompt installation**

A message has been displayed on the system console. Press Enter on the console to display the detailed error message.

c06   **Failed to identify the system type during a network boot**

The *bootinfo -B* command failed due to device support missing from the boot image that is required to support the client system's hardware. The boot server is likely missing device support for either the token-ring, ethernet or FDDI adapter. You need to install the appropriate device support on the server system, reboot the server, and remake the network boot image for the client.

c21   **Unable to configure logical network device during a network boot**

The *ifconfig* command failed. Report the problem to your network service organization.

c31   **Prompting user to select a system console**

c32   **User selected a graphical display as a console device**

c33   **User selected an ASCII display as a console device**

c40   **Installation data is being extracted from the install media during a no-prompt install**

c43   **Error restoring the AIX install programs during a tape boot**

Either the tape media is defective, the tape drive is defective, or the boot tape is incomplete. Create another boot tape and try booting from tape again.

c45   **Failed to configure a system console**

The *cfgcon* command failed because of missing device support for either the graphic adapter or standard I/O slot for ASCII monitors. You must install the appropriate device support on the system from which the backup tape was made, or install the appropriate device support on the network boot server, reboot the server, and remake the network boot image for the client.

c46   **Normal installation processing during a no-prompt install**

c47   **Unable to create a PVID on a disk**

This normally indicates a hard disk failure. If you are installing on the disk for the first time, check and reformat, if necessary, the disk in diagnostics and retry the installation.

c48   **Prompting user for input during a no-prompt install**

An error has occurred during a no-prompt installation. This LED is used to alert the user to the message displayed on the system console. The installation process has defaulted to prompt mode. Press Enter on the console to re-display the specific error message, then use the normal installation menus on the screen to correct the problem and begin the installation.

c50   **The rootvg volume group is being created during a no-prompt install**

c52   **Changing from RAM filesystem created by the boot process to the restored rootvg file systems during a no-prompt install**

200   **The system key is in secure mode when booting**

If booting from network, turn the key to service mode and press the reset key. If booting from tape, power off, turn the key to service, and power on.

260, 261 or 262
    The *BOOTP* menus have been invoked

The system is to be booted from the network and the *BOOTP* menus have been invoked. If they are not displayed, press Enter on the console.

510   **Configuring base system devices during a tape boot**

511 then blank screen
    Console configured but messages cannot be displayed

The *cfgcon* successfully configured a system console device; however, the console messages are not displayed because of missing or incorrect device support for the graphic adapter. You must install the appropriate device support on the system from which the backup tape was made, or install the appropriate device support on the network boot server, reboot the server, and remake the network boot image for the client.

512   **Configuring additional system devices during a tape boot**

513   **Restoring installation files from tape during a tape boot**

600   **Starting a network boot**

602   **Configuring base system devices during a network boot**

603   **Configuration of base system devices failed during a network boot**

There is likely device support missing from the boot image which is required to support the client system's bus, I/O or disk hardware. You need to install the appropriate device support on the server system, reboot the server, and remake the network boot image for the client.

604   **Configuring the boot network**

605   **Invalid network boot device provided**

The boot server is likely missing device support for either the token-ring, ethernet, or FDDI adapter. You need to install the appropriate device support on the server system, reboot the server, and remake the network boot image for the client.

606   **Configuring the boot network.**

608   **Copying network boot information file from boot server**

609   **Failed to copy network boot information from boot server**

The **tftp** command failed to tftp the file **/tftp/**_Client Hostname_**.sbinfo** from the boot server. One of the following usually apply:

1. The file does not have read permissions for all users.
2. The file does not exist.
3. An **/etc/tftpaccess.ctl** file exists on the boot server but does not provide access to the **/usr/lpp/sysback/netinst/boot** directory.
4. On a PCI-based system, you cannot use the leading zero's for any of the IP address in the SMS Menu. Even though the first **tftp** command works, the second one run will fail.

Rebuild the network boot image on the server and add the network boot client, making sure all values are correct.

610   **NFS mount of /usr filesystem from the server is hanging**

The **/etc/exports** file does not have permissions for the client to mount /usr. Type `exportfs` on the server and look for the line starting with "/usr". Make sure the client hostname is included on the line and that /usr is exported with root permission.

Example of output:

```
/usr -ro,root=node1,node2
```

In the above example, only node1 and node2 are exported. Add the network boot client again and verify that all the values are correct for the server's IP address, the gateway, and the subnet mask for the client.

611   **NFS mount of /usr filesystem from the server failed**

This often means that /usr filesystem was not exported to the client (see LED 610). There are known problems in AIX Version 4.1 that will affect SysBack network boots. These problems are fixed in the following file set levels:

- bos.adt.prof 4.1.4.5
- bos.rte.libc 4.1.4.5
- bos.net.nfs.client 4.1.4.4
- bos.sysmgt.quota 4.1.3.1
- bos.net.tcp.client 4.1.4.4

Make sure the above filesets are at this level or later. If updating the filesets, reboot the server, then remake the network boot image on the server.

613   **Configuration of gateway failed during network configuration**

The route command failed to add the gateway address provided. Report the problem to your network service organization.

Appendix D. Creating Scripts for Customizing the System Backup and Install Process

To add additional flexibility and automation to the backup and installation process for requirements specific to a particular customer environment, SysBack can call user-created shell scripts, if they exist, before and after the system backup and at various stages of the installation process when installing from a system backup.

These shell scripts can perform any function required and are executed with root user authority. The following are examples of functions you might want to perform:

Pre-backup functions:
- Remove all temporary files from the system to prevent unnecessary backup time and space.
- Send a message to all users that a backup is being performed.
- Automatically log users off the system.
- Shutdown the network daemons or disable tty ports to prevent user logins.

Post-backup functions:
- Restart network daemons and enable tty ports to allow users to log on.
- Send a message to a user or users that the backup is complete.

Post-install functions:
- Enable a shell for the install user to perform maintenance tasks.
- Remove unwanted configuration data from the system (i.e. user IDs and passwords). This is needed when cloning systems from a single backup image.

Script Names

During installation of SysBack, the **/usr/lpp/sysback/scripts** directory is created. This directory has read and write permissions only for the root user. Do not give any other user permission to add or change the scripts in this directory, because all scripts are executed with root user authority.

You can create four scripts, which can contain any function, in this directory. The scripts must be owned by root and must have execute permissions.

The SysBack system backup looks for the following scripts and executes them before system installation if they exist:

/usr/lpp/sysback/scripts/fsback.pre
> This script is executed when the **System Backup** option is selected from the SMIT menus or when the **sysback** command is executed. The script is executed before any other function is performed. Any environment variables exported before the backup is run are available to this script. In addition, the following variables will be defined:

> **DEVICE**   Name of tape devices, virtual device, or backup image file.

> **HOSTNAME**   Name of remote backup server, if any.

/usr/lpp/sysback/scripts/fsback.post

This script is executed at the end of the SMIT **System Backup** option or at the end of the **sysback** command. It is executed after all data is backed up for the root and other volume groups (if selected), but *before* the backup format is verified. Because the tape is left positioned at the end of the backup, this script might contain commands to append to the tape additional information that is not part of the system backup. Any environment variables exported before the backup is run are available to this script. In addition, the following variables are defined:

DEVICE   Name of tape devices, virtual device, or backup image file.

HOSTNAME   Name of remote backup server, if any.

The SysBack installation process looks for the following scripts and executes them at various stages of the installation if they exist:

/usr/lpp/sysback/scripts/install.pre

This script must exist on the system where the system backup tape was created or on the network boot server. It is restored and executed before the installation menus appear. The following variable will be defined:

BOOTDEV   Name of the boot device (i.e. "rmt0" for tape or "ent0" for ethernet adapter).

> **Note:** If this script is not made executable prior to creating your backup to tape, CD, or DVD, you may add it to a customized installation diskette as explained in the section: "Creating a Custom Installation Diskette" on page 294.

/usr/lpp/sysback/scripts/install.postroot

This script must exist on the system where the system backup was created. After all files are restored onto the newly installed system, this script exists on the new system. It is executed immediately after the / and /usr data is restored, but before any additional processing, such as recreating the boot logical volume or restoring the non-rootvg volume groups.

> **Note:** If this script is not made executable prior to creating your backup to tape, CD, or DVD, you may still:
> - add it to a customized installation diskette as explained in the section: "Creating a Custom Installation Diskette" on page 294.
> - define it in the "Changing SysBack CD/DVD Boot Defaults" on page 286, the "Changing SysBack Tape Boot Defaults" on page 281, or by "Setting the Network Install Client Defaults" on page 212.

Post First Boot Install Script

This script must exist on the system where the system backup was created. It may be located and named as you choose as long as it resides in the root volume group. This script is executed after the all data is restored as a part of the first reboot process. This script could be used to import non-rootvg volume groups that reside on RAID disks that can not be detected by the operating system until the first boot. You could also choose to restore data into these volume groups at this time as well.

> **Note:** If this script is not made executable prior to creating your backup to tape, CD, or DVD, you may still:

- add it to a customized installation diskette as explained in the section: "Creating a Custom Installation Diskette" on page 294.
- define it in the "Changing SysBack CD/DVD Boot Defaults" on page 286, the "Changing SysBack Tape Boot Defaults" on page 281, or by "Setting the Network Install Client Defaults" on page 212.
- define it in the "Post Install Configuration Options" on page 197 menu named **Post Device Configuration Options**

/usr/lpp/sysback/scripts/install.post

This script must exist on the system where the system backup was created. After all files are restored onto the newly installed system, this script exists exist on the new system. It is executed as the last step in the installation process, just before the second system reboot.

> **Note:** If this script is not made executable prior to creating your backup to tape, CD, or DVD, you may still:
> - add it to a customized installation diskette as explained in the section: "Creating a Custom Installation Diskette" on page 294.
> - define it in the "Changing SysBack CD/DVD Boot Defaults" on page 286
> - define it in the "Changing SysBack Tape Boot Defaults" on page 281,
> - define it in the "Setting the Network Install Client Defaults" on page 212.

Note: The scripts must have execute permissions or they will be ignored. To set the execute permissions, type the following after creating the scripts:

```
chmod u+x filename
```

(where "filename" is the name of the script file)

If any of the scripts return a nonzero error code or contain syntax errors, the backup or installation process alerts you and asks you to press Enter before continuing. The remainder of the process will then continue as usual. Within the scripts, checks should be made to ensure they are performing as planned, and the scripts should exit with a nonzero return code if they fail to perform their desired function. A "1" return code is sent by executing the **exit 1** command from within the script.

Post-Installation Script Environment Variables

The post-installation scripts can perform any commands available to the restored system. They can also perform remote commands, but only to the server from which the system was installed. There are several environment variables available to the post-installation scripts. They are as follows:

CLIENTIP   IP address of the restored system, if installed from a network install server. Note that this must be used in place of the HOSTNAME variable since the host name is not defined at this time.

DEVICE   Local tape drive names such as "/dev/rmt0" or remote tape drive name or filename.

GATEIP   IP address of the gateway machine, if any.

NETDEV	Device name of the network adapter (ent*, tok*, or fddi*), if booted or installed from a network installation server.	
POLICY	Indicates the sequential or parallel backup policy (S/P) if multiple local tape devices are used.	
REL	AIX Release level of the restored system	
REMOTE	Set to "1" if the installation was performed from a network install server. Otherwise, this variable is not set. If set, the **/etc/hosts** file on the client contains the "instserver" alias, which can be used with either the **sbclient** or other TCP commands to access the install server.	
SERVERIP	IP address of the installation server, if any. You cannot use the server's host names because it is not defined at this time.	
SUBNET	Subnet mask, if any.	
VER	AIX Version of the restored system.	
VGINFO	Filename of the temporary volume group information file. To learn more about the contents of a volume group information files, please review the **mkvginfo** command description.	

You can use these environment variables to access the local or remote installation devices.

Sample Scripts

There are a few sample scripts in the **/usr/lpp/sysback/scripts** directory. These can be modified as desired and enabled by changing the name of the sample script to the appropriate file name described above.

Note: The sample scripts provided are available to assist users in creating their own custom backup and installation scripts and are not supported by IBM.

The following sample scripts are contained in this directory:

fsback.pre_killusers

This sample script, when enabled, informs all users on the system that a system backup will start in 5 minutes. It resends the message each minute until the 5 minutes expire and then ends all user processes, except for the root user's. The system backup continues only after the user processes have been terminated.

To enable this script, change the name to **fsback.pre**.

install.postroot_hwmigrate

This sample script allows you to install a system backup created on a different system onto a new machine, even though the new machine has different device support software requirements. The new system must be booted from media that contains the required base device support, but the source system from where the backup was created does need to have the software support preinstalled.

To boot the new system from the media with the required bass device support, place an *AIX Version 4 Installation CD* in the drive of the new system during the installation process. After the rootvg volume group data is restored, the additional required device support is automatically added to the new system from the CD-ROM.

To enable this script, change the name to **install.postroot**.

install.post_rmnet

This script automatically removes any network configuration from the system at the end of the installation process. This is necessary when installing multiple systems from the same system backup to prevent multiple machines from existing on the network with the same network configuration.

This script also prevents SysBack from being removed from the system at the end of the installation process.

If this script is not enabled, and a system is installed from a system backup created from a different machine, you are prompted to select whether or not to remove the network configuration and the SysBack product.

To enable this script, change the name to **install.post**.

Appendix E. Device and System-Specific Information

This chapter provides various notes and tips for using SysBack with various types of devices, networks, or systems. The devices described in this chapter are not the full list of devices supported by SysBack. The information provided here is specific to devices or systems commonly used with SysBack, in which the performance or usability might be impacted by the configuration of SysBack, the device, or the system itself.

IBM 7208 8mm Tape Drives

All of the 7208 8mm tape drive models use a physical hardware blocking factor of 1024 bytes. This does not prevent the tape drive block size from being set to 512 bytes, but doing so causes the remaining 512 bytes of each physical block to go unused. Therefore, half of the tape capacity, and up to half of the backup performance, is lost if the tape block size is set to 512 bytes.

For best performance, the **tape block size should be set to 1024 bytes**, or any multiple thereof.

IBM 3490, Magstar®, DLT and LTO Tape Drives

These are very high performance tape drives and contain a very large data buffer. To achieve their highest throughput, send data to the tape drive's buffer in very large blocks. To do so, set the **Buffer Size** to 256 Kbytes when performing any SysBack backup. Change the block size of the tape drive to either 0 or 262144 (256 Kbytes) using the **Change Tape Drive Characteristics** option. Doing so helps ensure the drive continues streaming data without having to stop and wait for additional data from the system. You can set the buffer size to a higher value as long as the value is a multiple of the tape drive's block size.

Note: Examples of drives in these categories are the IBM 3490, 3590, 3570, 3575, 7205, 7337, 3580, 3581, 3583, 3584., and third party DLT drives. You should check with your vendor to determine if your drive benefits from using large blocks.

Note that increased performance of the tape drive does not necessarily result in faster backups if the data being backed up cannot be read at the same rate the tape drive is writing. In many cases, reading fragmented data from a file system on even the fastest disk drive can have trouble keeping up with the write performance of these tape drives. To achieve the best performance, read performance of the disk drives can be increased by keeping data contiguous on the disk and striping data across multiple disks to spread the I/O workload evenly across multiple devices. The settings and recommendations are not specific to SysBack. They are attributes of the device driver and affect other commands that use the drives, such as tar, or mksysb.

Also, make sure the tape drive device attribute **Autoload** is set to "no." You can change this feature using the **Change Tape Drive Characteristics** option. If this option is set to "yes," the loader changes tapes automatically, making the entire set of tapes appear like a single tape to SysBack. Instead, turn this option off so that SysBack handles the tape changes, placing a new volume label on each tape. It is

absolutely imperative that this be done for certain IBM devices that use the Atape.driver to ensure proper SysBack function. Failure to do so can render your data unrecoverable.

Any tapes previously created with "autoload=yes" should be tested for the ability to recover them. They can only be recovered by resetting "autoload=yes" since the tape was made that way. Also, for IBM devices that have the device driver option "use random mode to emulate auto", this must also be set to 'no'. To determine if your device driver has these settings, issue the command:

```
lsattr -El rmtX
```

where X represents your tape drive number. To change the autoload setting, issue the command:

```
chdev -l rmtX -a autoload=no
```

where X represents your tape drive number.

To change the random mode emulation setting, issue the command:

```
chdev -l rmtX -a emulate_auto=no
```

where X represents your tape drive number.

Other Tape Drives

Any tape drive that is recognized by AIX should be usable by SysBack, although no support can be guaranteed. Most tape drives have at least a 64 Kbyte buffer, which is the default buffer size that SysBack uses. If you are using a tape drive that does not have a large buffer, usually resulting in a "*write: I/O error*" or "*illegal parameter*" messages, you might need to reduce the **buffer size** value that SysBack uses each time a backup is performed. Try using "32" (Kbytes) as the next value, then "16,", and so on. If the error continues, either the tape drive or tape media is defective, or it is not supported by AIX or SysBack.

IBM 7331 8mm Tape Library

If the 7331 8mm Tape Library is installed with 2 tape drives, SysBack backups usually achieve twice the performance of a single 8mm tape drive when configured as described in this section.

To configure SysBack and the 7331 library for the best performance, create a SysBack parallel virtual device containing both tape drives in the unit. Then set the 7331 to "Split Sequential" mode. This allows SysBack to "stripe" the data across both tape drives, achieving twice the performance, while allowing the 7331 to change the tapes in each drive as the backup reaches the end of volume.

When in Split-Sequential mode, the 7331 assigns the first, or top, 10 tapes in the magazine to the top tape drive and the bottom 10 tapes in the magazine to the bottom tape drive. Note that the SCSI connection to the 7331 library itself is not used by SysBack, only the SCSI connection to the tape drives.

IBM 7332 4mm Tape Library

The 7332 is a low-cost tape drive providing fast 4mm tape write performance, while allowing unattended operation of a tape autoloader. When configured for use with SysBack, either 4 internal or 12 external tapes can be written to sequentially without user intervention.

To do so, create a sequential virtual device containing the single 4mm tape drive and indicate that an autoloader is used. Any backups performed to this tape drive automatically span across as many tape cartridges are in the magazine without user intervention.

Other Tape Libraries or Autoloaders

Most tape libraries, or autoloaders, that have a "sequential mode" can be used with SysBack. "Sequential Mode" indicates that the tape loader itself automatically inserts a new cartridge each time a cartridge is ejected from the drive. The tape cartridges are usually inserted in sequential order, depending on their location in the unit, but some loaders allow the user to select the order in which the tapes will be used.

To use SysBack with an autoloader, create a sequential virtual device containing the tape drive (not the loader itself), and indicate in the virtual device configuration that an autoloader is used. Then, set the autoloader to sequential mode.

By not using any device-specific loader controls, SysBack can work with virtually any tape loader set in sequential mode. SysBack does not control the loader in any way. Instead, SysBack rewinds and ejects the current tape from the drive any time a read or write operation reaches end of tape and waits for the loader to insert the next volume. Upon doing so, the backup continues automatically without user intervention.

Because libraries or loaders can differ, SysBack cannot claim to support every loader, as the sequential operation is the function of the loader and not of SysBack. It is therefore up to the user to perform the steps to properly configure the loader and verify the proper operation of the sequential mode as described above.

For information related to enabling SysBack to execute your own customer scripts to manipulate the robotic mechanism of your library, please refer to "End of Tape (EOT) Processing Options" on page 298.

IBM 7133 Serial Storage Architecture (SSA) disk subsystem

The serial storage architecture provides a high-speed interconnection technology for SSA disk drives. The drives and cables are hot pluggable, which enables a disk drive to be replaced while the unit is operational. Also, the location within the loop is transparent to AIX, enabling a disk not currently in use to change locations without affecting the operation of the system.

Because AIX does not keep track of the physical location of the disk drive, it is not possible for SysBack to record and later reference a disk by its physical location. Instead, SysBack keeps track of the physical volume ID, which is unique to each individual disk drive. When you recreate a volume group on the same physical disks as they were previously installed, all disks are recognized and automatically added to the volume group. However, when you clone systems or replace a drive,

the disk or disks appear to be missing. You can the use the **Edit volume group and logical volume attributes** option to re-select the drives for each volume group.

IBM 7135 RAIDiant Array

The IBM 7135 is not a supported boot device by AIX. During the SysBack system installation process, AIX recognizes the disks as "Other SCSI Disk". AIX cannot, however, create a volume group on the disks at this time. The 7135 should be powered off or disconnected when using SysBack to install the system.

When the installation is complete and before rebooting the system in normal mode, power on the 7135. Each of the 7135 disks is then recognized as a "7135 Disk Array Device", assuming the 7135 device support was installed on the system. You can then recreate and restore volume groups on the 7135 disks using the SysBack system backup.

When AIX is installed, it "walks the bus," configuring all disks in the order in which they appear. Powering off the 7135 during installation of the rootvg ensures that the internal disk drives, onto which the *rootvg* volume group is installed, are named with the first hdisk names (e.g, *hdisk0*).

IBM 7137 and Other RAID Devices

RAID storage units have a number of unique features that vary depending upon the actual RAID box and have an impact on the use of SysBack. RAID boxes provide fault tolerance in case of a disk failure (except for RAID-0, which is simply a form of disk striping). Most implementations of RAID use RAID-5 or RAID-1, which provide fault tolerance for a disk failure.

Before a RAID box can be used, it must be configured. This often includes choosing the RAID level, number of LUNs (known as "hdisks" to AIX), size, and other characteristics. Creating and configuring the LUNs is done in various ways: through software on the machine such as for the IBM 7135, through a keypad on the RAID box such as for the IBM 7137, or through other means such as a terminal attached to the RAID box, switch settings, and so on. Only after the LUNS are configured in the system do the "hdisks" become available for use in AIX volume groups.

Some RAID devices, including the 7137, are recognized by AIX without the need to configure any software on the system; however, the disk descriptions show as "Other SCSI disks". In most cases, as with the 7137, the disks can be used by AIX with no further software configuration. Because no special software configuration is required, they can be recognized by the SysBack installation process and can be included in any volume group, including the *rootvg* volume group.

If the RAID device requires special device drivers or software customization before they can be used, they are either unrecognized or unusable during the SysBack installation process. If this is the case, power off the unit during the installation process to ensure that the remaining system disks receive the first available "hdisk" names. After the rootvg volume group is installed on other supported disks, you can power on the RAID unit before rebooting the system in normal mode. At that time, assuming the RAID software support is installed, the RAID disks can then be configured into the system. Additional volume groups can be recreated and restored from the SysBack system backup onto the RAID disks.

Appendix F. Support information

This section describes the following options for obtaining support for IBM products:

- "Searching knowledge bases"
- "Obtaining fixes"
- "Contacting IBM Software Support" on page 498

Searching knowledge bases

If you have a problem with your IBM software, you want it resolved quickly. Begin by searching the available knowledge bases to determine whether the resolution to your problem is already documented.

Search the information center

You can use the search function of IBM Tivoli Storage Manager Information Center to query conceptual information, instructions for completing tasks, reference information, and support documents. The information center is at the following Web site: publib.boulder.ibm.com/infocenter/tivihelp/v1r1/index.jsp.

Search the Internet

If you cannot find an answer to your question in the information center, search the Internet for the latest, most complete information that might help you resolve your problem. To search multiple Internet resources for your product, go to the support web site for the product (http://www-306.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManagerforSystemBackupandRecovery.html) and look for the section to search the support knowledge base. From this section, you can search a variety of resources including:

- IBM technotes
- IBM downloads
- IBM Redbooks
- Forums and newsgroups

Obtaining fixes

A product fix might be available to resolve your problem. You can determine what fixes are available for your IBM software product by checking the product support Web site:

1. Go to the IBM Software Support Web site for SysBack: SysBack Support Web Site http://www-306.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManagerforSystemBackupandRecovery.html.
2. From this page you can view all product downloads or search for specific fixes.

To receive weekly e-mail notifications about fixes and other news about IBM products, follow these steps:

1. From the support page for any IBM product, click **My support** in the upper-right corner of the page.

2. If you have already registered, skip to the next step. If you have not registered, click register in the upper-right corner of the support page to establish your user ID and password.

3. Sign in to **My support**.

4. On the My support page, click **Edit profiles** in the left navigation pane, and scroll to **Select Mail Preferences**. Select a product family and check the appropriate boxes for the type of information you want.

5. Click **Submit**.

6. For e-mail notification for other products, repeat Steps 4 and 5.

For more information about types of fixes, see the *Software Support Handbook* http://techsupport.services.ibm.com/guides/handbook.html .

Contacting IBM Software Support

IBM Software Support provides assistance with product defects.

Before contacting IBM Software Support, your company must have an active IBM software maintenance contract, and you must be authorized to submit problems to IBM. The type of software maintenance contract that you need depends on the type of product you have:

- For IBM distributed software products (including, but not limited to, Tivoli, Lotus, and Rational products, as well as DB2 and WebSphere products that run on Windows or UNIX operating systems), enroll in Passport Advantage in one of the following ways:
    - **Online**: Go to the Passport Advantage Web page http://www.lotus.com/ services/passport.nsf/WebDocs/Passport_Advantage_Home and click **How to Enroll**
    - **By phone**: For the phone number to call in your country, go to the IBM Software Support Web site http://techsupport.services.ibm.com/guides/ contacts.html and click the name of your geographic region.
- For IBM eServer software products (including, but not limited to, DB2 and WebSphere products that run in zSeries, pSeries, and iSeries environments), you can purchase a software maintenance agreement by working directly with an IBM sales representative or an IBM Business Partner. For more information about support for eServer software products, go to the IBM Technical Support Advantage Web page http://www.ibm.com/servers/eserver/techsupport.html .

If you are not sure what type of software maintenance contract you need, call 1-800-IBMSERV (1-800-426-7378) in the United States or, from other countries, go to the contacts page of the IBM Software Support Handbook on the Web http://techsupport.services.ibm.com/guides/contacts.html and click the name of your geographic region for phone numbers of people who provide support for your location.

Follow the steps in this topic to contact IBM Software Support:

1. "Determine the business impact of your problem" on page 499
2. "Describe your problem and gather background information" on page 499
3. "Submit your problem to IBM Software Support" on page 499

Determine the business impact of your problem

When you report a problem to IBM, you are asked to supply a severity level. Therefore, you need to understand and assess the business impact of the problem you are reporting. Use the following criteria:

1. Severity 1:

   Critical business impact: You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution.

2. Severity 2:

   Significant business impact: The program is usable but is severely limited.

3. Severity 3:

   Some business impact: The program is usable with less significant features (not critical to operations) unavailable.

4. Severity 4:

   Minimal business impact: The problem causes little impact on operations, or a reasonable circumvention to the problem has been implemented

Describe your problem and gather background information

When explaining a problem to IBM, be as specific as possible. Include all relevant background information so that IBM Software Support specialists can help you solve the problem efficiently. To save time, know the answers to these questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, and messages that are related to the problem symptoms? IBM Software Support is likely to ask for this information.
- Can the problem be recreated? If so, what steps led to the failure?
- Have any changes been made to the system? (For example, hardware, operating system, networking software, and so on.)
- Are you currently using a workaround for this problem? If so, please be prepared to explain it when you report the problem.

Submit your problem to IBM Software Support

You can submit your problem in one of two ways:

- **Online**: Go to the "Submit and track problems" page on the IBM Software Support site http://www.ibm.com/software/support/probsub.html . Enter your information into the appropriate problem submission tool.
- **By phone**: For the phone number to call in your country, go to the contacts page of the IBM Software Support Handbook on the Web http://techsupport.services.ibm.com/guides/contacts.html and click the name of your geographic region.

If the problem you submit is for a software defect or for missing or inaccurate documentation, IBM Software Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Software Support provides a workaround for you to implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the IBM product support Web pages daily, so that other users who experience the same problem can benefit from the same resolutions.

For more information about problem resolution, see "Searching knowledge bases" on page 497 and "Obtaining fixes" on page 497.

Appendix G. Accessibility

Accessibility features help users with physical disabilities, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in this product enable users to do the following:

- Use assistive technologies, such as screen-reader software and digital speech synthesizer, to hear what is displayed on the screen via the operating system command line interface available for this product. Consult the product documentation of the assistive technology for details on using those technologies with this product.
- Operate specific or equivalent features using only the keyboard

In addition, the product documentation was modified to include features to aid accessibility:

- All documentation is available in a convertible PDF format to give the maximum opportunity for users to apply screen-reader software.
- Standard shortcut and accelerator keys are used by the product and are documented by the operating system. Refer to the documentation provided by your operating system for more information.
- Magnify what is displayed on the screen.
- All user documentation is provided in both HTML and PDF format. Descriptive text is provided for all documentation images.

In addition, the product documentation was modified to include features to aid accessibility:

Navigating the interface using the keyboard

Standard shortcut and accelerator keys are used by the product and are documented by the operating system. Refer to the documentation provided by your operating system for more information.

Magnifying what is displayed on the screen

You can enlarge information on the product windows using facilities provided by the operating systems on which the product is run. Refer to the documentation provided by your operating system for more information.

Appendix H. Notices

This information was developed for products and services offered in the U.S.A. IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

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