

Novell Open Enterprise Server

www.novell.com

SBCON ADMINISTRATION GUIDE

October 25, 2005



Novell[®]

Legal Notices

Novell, Inc. makes no representations or warranties with respect to the contents or use of this documentation, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, Novell, Inc. reserves the right to revise this publication and to make changes to its content, at any time, without obligation to notify any person or entity of such revisions or changes.

Further, Novell, Inc. makes no representations or warranties with respect to any software, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, Novell, Inc. reserves the right to make changes to any and all parts of Novell software, at any time, without any obligation to notify any person or entity of such changes.

Any products or technical information provided under this Agreement may be subject to U.S. export controls and the trade laws of other countries. You agree to comply with all export control regulations and to obtain any required licenses or classification to export, re-export, or import deliverables. You agree not to export or re-export to entities on the current U.S. export exclusion lists or to any embargoed or terrorist countries as specified in the U.S. export laws. You agree to not use deliverables for prohibited nuclear, missile, or chemical biological weaponry end uses. Please refer to www.novell.com/info/exports/ for more information on exporting Novell software. Novell assumes no responsibility for your failure to obtain any necessary export approvals.

Copyright © 1999-2003, 2005 Novell, Inc. All rights reserved. No part of this publication may be reproduced, photocopied, stored on a retrieval system, or transmitted without the express written consent of the publisher.

Novell, Inc. has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at <http://www.novell.com/company/legal/patents/> and one or more additional patents or pending patent applications in the U.S. and in other countries.

Novell, Inc.
404 Wyman Street, Suite 500
Waltham, MA 02451
U.S.A.
www.novell.com

Online Documentation: To access the online documentation for this and other Novell products, and to get updates, see www.novell.com/documentation.

Novell Trademarks

eDirectory is a trademark of Novell, Inc.

NetWare is a registered trademark of Novell, Inc., in the United States and other countries.

NetWare Storage Management Services and SMS are trademarks of Novell, Inc.

Novell is a registered trademark of Novell, Inc. in the United States and other countries.

Novell Storage Services is a trademark of Novell, Inc.

SUSE is a registered trademark of Novell, Inc., in the United States and other countries.

Third-Party Materials

All third-party trademarks are the property of their respective owners.

About This Guide

This guide describes how to use the SBCON utility as the storage management engine (SME) for NetWare® and SLES.

This guide is divided into the following sections:

- [Chapter 1, “What Is SBCON,” on page 7](#)
- [Chapter 2, “Using SBCON,” on page 11](#)
- [Chapter 3, “Managing SBCON,” on page 33](#)
- [Chapter 4, “Troubleshooting SBCON,” on page 45](#)
- [Appendix A, “TSA Features,” on page 47](#)

Audience

The audience for this guide includes network administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation, or go to www.novell.com/documentation/feedback.html and enter your comments there.

Additional Documentation

For documentation on SMS, see the *[NetWare 6.5 Storage Management Services Administration Guide](#)*.

Documentation Conventions

In Novell documentation, a greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path.

A trademark symbol (® , ™ , etc.) denotes a Novell trademark. An asterisk (*) denotes a third-party trademark.

When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a backslash. Users of platforms that require a forward slash, such as Linux* or UNIX* , should use forward slashes as required by your software.

What Is SBCON

NetWare® Storage Management Services™ (SMS) is a collection of software programs that provides backup, restore, and data migration services. These services are performed by a collection of components that are independent of operating systems and hardware.

The Storage Management Engine (SME) is central to the SMS architecture. The engine communicates with the network clients to back up and restore information. Novell provides the SBCON utility as a basic backup engine for NetWare and SLES.

- [Section 1.1, “SBCON Components,” on page 7](#)
- [Section 1.2, “Supported Storage Devices and Drivers,” on page 7](#)
- [Section 1.3, “Preparing to Back Up,” on page 8](#)
- [Section 1.4, “Planning a Backup Schedule,” on page 8](#)
- [Section 1.5, “Determining an Appropriate Backup Type,” on page 8](#)
- [Section 1.6, “Keeping a Backup Logbook,” on page 8](#)
- [Section 1.7, “Session Files,” on page 9](#)

1.1 SBCON Components

The following components are listed:

- **Storage Backup Console (SBCON):** The user interface to manage backup and restore operations
- **Storage Management Engine (SME):** Used backup and restore operations.
- **Storage Management Device Interface (SMSDI):** Used to pass information between the SME and the storage device.
- **Q Manager:** Used to get the jobs ready for execution, from the eDirectory queue.
- **Device drivers:** Used to control the behavior of the storage devices. See [Section 1.2, “Supported Storage Devices and Drivers,” on page 7](#).

In addition to these components Storage Management Data Requester (SMDR) and Target service Agents (TSAs) are also utilized to perform the backup and restore operations.

For more information, see “[SMS Components](#)” in the *NetWare 6.5 Storage Management Services Administration Guide*.

1.2 Supported Storage Devices and Drivers

SBCON supports 0.25-inch, 4mm, and 8mm storage devices. If you are using 4mm tape, use only DDS (Digital Data Storage)-certified, computer-grade tapes.

IMPORTANT: To ensure reliable operations, pretest all media storage devices that are not Novell certified with the appropriate NetWare device driver and SBCON backup and restore utility.

Use the driver files recommended by your hardware manufacturer.

1.3 Preparing to Back Up

Careful planning can help you minimize the impact of data loss. Before you back up, consider the following:

TSAFS supports backup of open files on Novell Storage Services (NSS) volumes if the CopyOnWrite feature is enabled. The Supervisor right is required to back up open files.

To enable CopyOnWrite on a single NSS volume, at the server console, enter `nss /FileCopyOnWrite=volume_name`.

Continue with the next sections to prepare for the backup session.

1.4 Planning a Backup Schedule

Before you begin backup procedures, plan a backup schedule based on your needs. Consider such factors as the number of users and frequency of changes to files.

You can perform different types of backups on different schedules:

- **Daily:** Perform an incremental or differential backup after the close of business. If revisions are heavy and rapid, consider several backup sessions each day.
- **Weekly:** Perform an incremental or differential backup after the close of business on the last day of the week for three of the four weeks in the month.
- **Monthly:** Perform a full backup on the last business day of the month.
- **Major changes:** Perform a full backup before and after you change your configuration, and before and after you upgrade your server to a new version of NetWare.
- **Application changes:** Perform a custom backup before and after you modify applications.

1.5 Determining an Appropriate Backup Type

Each type of backup has a different effect on the backup and restore process. When planning your backup schedule, consider all of the following variables before determining which schedule is right for you.

Media usage and backup speed. This helps increase the speed of the restore.

Restoring after incremental backups. If you have performed full and incremental backups and need to restore data, you must restore the last full backup as well as all subsequent incremental backups.

Restoring after differential backups. If you have performed full and differential backups and need to restore data after an unexpected loss, restore only the last full and differential backup.

1.6 Keeping a Backup Logbook

Keep a hard copy log of your backups in case your online log and error files become corrupted. The log should contain the following information:

- Source backed up (such as the server name)
- Full path for “**session**” log and error files directory

- Full path for backed-up data
- Label of the media on which the backup is stored
- Description of the session
- Name or initials of the person performing the backup
- Date and time of the backup session

1.7 Session Files

Whenever you back up or restore files or directories, a log and corresponding error files are created for that particular session on the server on which you are executing the job. The .log file is the session file for that particular job.

The need to create a session file arises when you are restoring the data on a server other than the one you backed up from. The server should possess the session ID of all the jobs that are present on the tape so that the SME can restore it. These session IDs are created from the .log files. See [Section 3.7, “Creating Session Files,” on page 42](#).

1.7.1 Log and Error Files

The files of the backup session are stored in a default directory (such as `sys:system\tsa\log`). If you prefer, you can create your own directory for the log and error files as long as it resides on the host server.

The files of the restore session are stored in the directory (`sys:system\tsa\restore`). You cannot modify the location for the files.

The files can be accessed through the SBCON Main Menu.

The error file is labeled with the same description that you give the restore session (such as Friday’s Full Backup) and is accessed through the Log/Error File Administration option of the SBCON Main menu.

TIP: You might want to create individual log directories for the different types of backup or restore session targets or different organizational units.

SBCON keeps a list of all the log and error files. These lists show

- The description you enter for the session.
- The date and time the session was begun or, in the case of a delayed backup session, the time the session was scheduled.
- The name of the target the data was backed up from.

Log File

The log file is created on the host server the first time a particular set of data is backed up. This file contains the following:

- The session date and time and the description you entered.
- The target from which the data was backed up for a backup session.

- The target that was backed up and the location on the server where the data was restored to during a restore session.
- Media set identification information.
- The area of the file system structure that was backed up or restored (volume name, directory name, etc.).
- The names of files that were backed up or restored.
- The numerical location of the data on the storage media.

Error File

The error file is created on the host server the first time a particular set of data is backed up. It contains a list of any errors that occurred during a backup or restore session.

This file contains the following:

- The session date and time and the description you entered.
- The target from which the data was backed up for a backup session.
- The target that was backed up and the location on the server where the data was restored to during a restore session.
- Media set identification information.
- The area of the file system structure that was backed up or restored.
- The total number of parents and children that were backed up or restored.
- The names of files that were not backed up or restored, along with any error messages or information.
- Skipped data sets (any file that is open when a session begins, is not backed up or restored, and is listed as a skipped data set).

Using SBCON

SBCON is the graphical interface on the NetWare® server for creating backup and restore jobs. The setting up of SBCON for backup and restore jobs includes the following tasks:

This section provides a brief overview and specific information on completing each task.

- [Section 2.1, “Preparing to Use SBCON,” on page 11](#)
- [Section 2.2, “Backing Up Data Using SBCON,” on page 13](#)
- [Section 2.3, “Restoring Data Using SBCON,” on page 19](#)

2.1 Preparing to Use SBCON

- [“Memory Requirements” on page 11](#)
- [“GuideLines to Use SBCON” on page 11](#)
- [“Loading Controller and Storage Device Drivers on the Server” on page 12](#)
- [“Loading SBCON” on page 13](#)

2.1.1 Memory Requirements

To run the SBCON utility, the host server requires the following:

- A minimum of 3 MB free memory for SBCON
- Memory required to run NetWare 6.5 (currently 256 MB RAM)
- Memory required to run the clients

If 3 MB of memory is not available, try setting the storage buffers lower than the default and still run the utility.

2.1.2 GuideLines to Use SBCON

Before you start SBCON and begin backups, follow these guidelines to make backups easier and to avoid problems later:

- **Log in.** You will have limited success backing up and restoring if you log in without the Supervisor right.

For security reasons, many SBCON options are limited to the network administrator.

- **Reserve disk space for temporary files.** Make sure you have disk space available (1 to 2 MB) on the target server’s volume sys: to accommodate log and error files.

SBCON creates temporary files on the target server during backup. If you have linked UNIX* files or files with extended attributes, the temporary files might be larger than 1 MB.

- **Do not mount or dismount volumes on NetWare or mount points on SLES during a backup or restore session.** The data might be corrupted or an “**association**” might occur at the host server.

- **Use the correct name space and name space formats.** If you do not use the correct name space and name space formats when entering paths and file names, files can't be restored.
Name spaces: NFS, and Long
Name space formats:
 - For Macintosh, use *Volume::directory:directory:filename*
 - For NFS on Linux use */directory/directory/filename*
 - For all others, use *Volume:/directory/directory/filename*
- **Exit SBCON before unloading drivers.** If you unload a manually loaded driver (such as aha1740.dsk or aspitran.dsk) before exiting SBCON, you might cause the host server to abend.
- **Use original case for non-DOS names.** Non-DOS pathnames and filenames are case sensitive. NetWare recognizes DOS pathnames and filenames only in uppercase. If you're not sure of the original case, refer to your log file.

2.1.3 Loading Controller and Storage Device Drivers on the Server

Controller and device drivers control the mechanical operation, such as read, write, forward, back, and stop of various storage devices and media.

Ensure that you have installed the storage device controller and storage device according to the hardware manufacturer's instructions.

When NetWare 6.5 is installed, the entries for the device drivers are automatically listed in the “*startup.ncf*” file.

Whenever you want to add new drivers, you can either list them in *startup.ncf* or use the following steps:

- 1 At the server console prompt, enter:

```
load controller_device_driver_names
load storage_device_driver_names
```

For example, to load the drivers from drive C:, enter:

```
load scsi154x.hamport=24
load scsihd.cdm
load scsi2tp.cdm
```

- 2 In NWCONFIG, select Driver Options > run *hdetect.nlm* from the server console.
- 3 (Conditional) To register the storage device with the system, enter the following at the server console prompt:

```
scan for new devices
```

NOTE: If you load the drivers from the *startup.ncf* file, you do not need to use the scan for new devices command.

To check the list of devices, enter the following at the server console prompt:

```
list devices
```

2.1.4 Loading SBCON

To load SBCON from the server command line:

- 1 At the server console, enter

```
smsstart
```

TSAFS and SMDR modules are loaded with default configuration values.

TSANDS must be manually loaded for backup and restoration of Novell® eDirectory™.

QMAN and SMSDI are auto loaded along with SBCON.

For starting up SMS services on SLES machines see, *NetWare 6.5 Storage Management Services Administration Guide*.

- 2 Load SBCON by entering

```
load sbcon
```

2.2 Backing Up Data Using SBCON

When you back up your data, you should use the command line. Make sure that the following prerequisites are met before proceeding with the backup process:

- Understand the process for loading SBCON.
See [“Loading SBCON” on page 13](#)
- If you are backing up the eDirectory database, ensure that eDirectory synchronization and communication are functioning properly.
Before starting the backup, make sure eDirectory is fully functional. This means that all partitions are synchronizing correctly.
If your backup host and targets communicate across a WAN, check the status of the WAN links to verify that they are operating properly.
- If you are backing up the file system, make sure you have Read and File Scan [“rights”](#) to the directories and files you are backing up.
- Ensure that you know what type of backup you want to perform: [full](#), [differential](#), or [incremental](#).
- If you use the Advanced Options, ensure that you know the file system structure of the target you are backing up. You will be prompted for the paths to the volumes and directories that you want to include in or exclude from your backup.
- Ensure that you have loaded the drivers for your specific device and controller board.
- Ensure that the required files for your target are loaded.
- Ensure that you have loaded the SBCON files for your specific target.
See [“Loading the Target Service Agents”](#) in the *NetWare 6.5 Storage Management Services Administration Guide*.
- Ensure that media is inserted into your storage device.

Backup Procedure

- 1 Load the SBCON modules.
See [“Loading SBCON” on page 13](#).

- 2 Click Main Menu > Job Administration > Backup.

Description: Backup Options screen

```

Backup Options
Target Service:      <Not Connected>
What to Backup:     <Select to View>
Description:
Device/Media Name:  *.*
Advanced Options:   <Select to View>
Append Session:     No
  
```

- 3 Click Target Service to select the NetWare or SLES server running your backup or restore Target Service Agent.

To be able to select the server, you need to load the correct Target Service Agent (TSA). See “Loading the Target Service Agents” in the *NetWare 6.5 Storage Management Services Administration Guide*.

If you do not see the target you want on the list, check for these possible causes:

- The correct Target Service Agent is not loaded on either the host or the target. See “Loading the Target Service Agents” in the *NetWare 6.5 Storage Management Services Administration Guide* for load commands.
- Network traffic is heavy. Press Esc to return to the Main Menu, and then press Enter again. Your target should now be listed.

- 4 Select a target from the Target Services list.

The following table describes the targets that can be selected for the backup.

If you are Backing Up	Then Select
cluster-enabled resources	The cluster-enabled pool you want to back up
The file system	The server whose file system you want to back up
The eDirectory database	The server with TSANDS loaded
Server-specific information	The server whose server-specific information you want to back up, then choose to back up the file system.

- 5 When prompted, enter the username (and context, if required) for the target.

If SBICON rejects the username you entered, you probably need to include the context where the User object is located. For example, instead of entering *ADMIN* as the username, enter *.CN=ADMIN.O=company_name* or *.ADMIN.company_name*.

You must include the context in the username at this point if the username you use exists in an eDirectory container that is different from the bindery context set on the server running the engine.

- 6 (Conditional) If requested, enter the password for the target.

SBICON will take a few moments to attach to that target.

If you select the default values on this form, a full backup of the source is performed. Otherwise, if you want to perform an incremental or differential backup, select Advanced Options.

- 7 Click What to Back Up and press Enter.

- 8 Press Insert, select the volumes and files you want to back up, and press Esc.

The selected volumes and files appear in the List Resources screen.

- 9 In the Description field, enter a descriptive name for the backup session.

This is a descriptive name of the job, which will help you identify the specific backup session; if a restore is necessary, you can easily identify the session you need. There is no special requirement for what to enter as the session description.

TIP: You might want to include the full path of the data (for example, `sys:home\reports\july.02`) which you will need to know if a restore session is necessary.

- 10 Click Device/Media Name and select a device.

A list of available objects is displayed in the Select a Device screen.

If you accept the default value, the engine selects the device and media that you have designated as the default.

NOTE: If there is only one media type available, it will be treated as the default.

If your device has more than one storage device attached, select an available device from the list. If the device contains multiple media, select the media for the backup.

If the storage media does not have a label, SBICON displays a message saying that the media cannot be identified. Set the label before selecting it for a backup job.

- 11 Select Advanced Options.

For more details, see [“Customizing Backup” on page 15](#).

- 12 Select Append Session.

This option appears only if your device supports appending to previous sessions on the media.

Accept the default YES if you want to preserve all sessions on the media. The backup session is appended to the media at the end of the previous session. Each appended session has separate backup and error logs.

If you want to overwrite the data on the media, enter NO. The media rewinds and existing data is overwritten by the next backup.

TIP: Labeled media is not considered empty media. No sessions are necessary on the media for you to set the Append option to Yes.

Delete the log and error files for any session you overwrite to avoid trying to restore a session that no longer exists.

- 13 Press Enter to save the settings and continue with the backup.

WARNING: If you are appending a backup session to a media set (two or more tapes), use the tape with maximum space.

- 14 To return to the Main Menu, press Esc until you back out to the Main Menu.

- 15 To exit SBICON, press Esc again and answer the confirmation prompt.

2.2.1 Customizing Backup

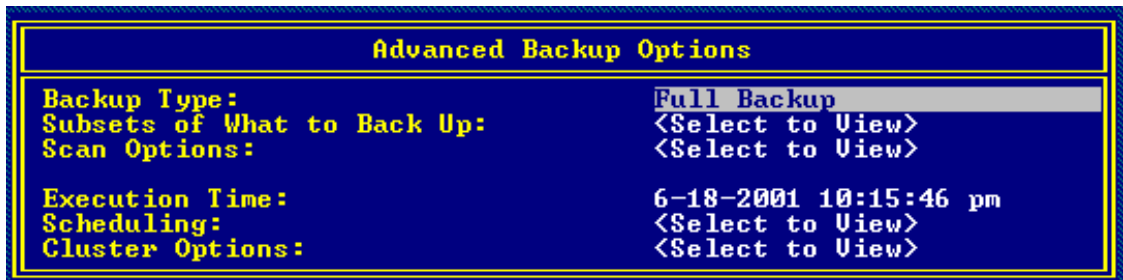
You can customize your backup using the Advanced Backup Options form when you use SBICON at the server to launch your backup program. This form allows you to specify exactly what you want to

back up data. It could be the server, the eDirectory database, directory, or file. You can even specify subsets of groups. The Advanced Backup Options form activates only after you have selected at least one of the resources (directory or file). Select Advanced Options from the Backup Options form to perform advanced backup sessions. See [Section 2.2, “Backing Up Data Using SBCON,”](#) on page 13.

TIP: SBCON displays prompts and messages at the bottom of the screen. For example, you can press F1 for help at any time.

If you want to perform a series of backups and restores and need to change your target, see [Section 3.2, “Changing Your Target,”](#) on page 33.

Figure 2-1 Advanced Backup Options screen



A custom backup allows you to specify exactly what you want to back up: server, volume, the eDirectory database, directory, or file.

To customize a backup:

- 1 Select Backup Options > Advanced Options.
- 2 Select Backup Type.

By default, the Storage Management Engine (SME) performs a full backup. See [Section A.2, “Backup Types,”](#) on page 51. Differential and incremental backups are not interchangeable. See [Section 1.4, “Planning a Backup Schedule,”](#) on page 8.

IMPORTANT: If you choose to include migrated data, ensure that your backup media capacity matches the jukebox media capacity.

- 3 Select Subsets of What To Back Up.

The default setting means that everything in the Subsets of What You Want to Backup screen is backed up.

Include/Exclude TSA Resources: Includes or excludes resources such as servers or volumes.

Include/Exclude Directories: Includes or excludes directories.

Include/Exclude Files: Includes or excludes files.

Include/Exclude path/files: Includes or excludes pathnames and files.

- 4 Select Scan Options.

The How to Scan What you Are Backing Up screen appears.

- 5 Do one of the following:

- If you do not want to accept the default (nothing will be excluded), type Y (Yes) and press Enter.

- Choose to exclude subdirectories, hidden files, system files, etc.

6 Press Esc to Finish.

For information about how SBCON scans data, see [“Scanning Data Sets” on page 49](#).

7 Select Execution Time.

The Edit Date and Time screen appears. You can choose the default date and time shown for the backup to begin, or you can type a new date and time. You can change the month/day/year and hour/minute/second fields. The engine should initiate the rescheduled job.

To schedule the job to run another time, press Enter and proceed to [Step 8](#). To accept the default, press Enter.

8 (Optional) Select Scheduling.

Reschedule: Select Yes to reschedule.

Rerun Interval: Specify the duration in terms of elapsed time and days, months or years to rerun an already scheduled job.

The Edit Date and Time screen appears. You can specify the number of days, months, or years after which an already scheduled job will run.

The day, month, or year you enter should not be the actual date when you want the job to run; rather, it is the duration after which the job gets executed.

Example

If you have scheduled a job to run on 03/20/1999 and want to rerun the job after two months and at the same time, then the Rerun Interval field should be the following:

Year: 0, Month: 2, Day: 0

Hour: 0, Minute: 0, Second: 0

Rerun Count: Specify the number of times you want to rerun a job after the current execution.

Keep Finished Jobs: Select Yes to keep the job in the queue after execution so that it can be rescheduled when you need it.

NOTE: If you are performing a series of backups or restores and need to change your target, follow the procedures in [Section 3.2, “Changing Your Target,” on page 33](#).

2.2.2 Backing Up Cluster-Enabled Resources

SBCON supports automatic recovery of backup sessions if failover or failback occurs. The backup engine reconnects to the Target Service Agent and resumes the backup from where it had terminated. Various cluster options like Enable Auto-Recovery and Retry Interval are provided by SBCON. You can use the default values or reset the values while submitting the backup job. The engine begins the reconnection attempts after waiting for a configurable time, and then retries at regular intervals until the connection is re-established or the number of retries has expired.

After the connection is re-established, the internal structures of the TSA are built and the recovered session is continued from where it had terminated. User intervention is not required during the recovery period. You can view the status in the Session Report screen.

Consider the following before preparing for backup and restore of cluster-enabled resources:

- If SBICON is loaded on a cluster node and a backup session for a cluster-enabled pool is submitted, the session cannot be recovered if a failover or failback condition occurs on the host server.
- SBICON can back up and restore only one cluster-enabled pool per session. This is because the engine is connected to the cluster pool instead of the server on which the cluster pool is mounted.
- If you quit an ongoing backup job with the intention of resubmitting the same job later, the job will not restart from where it was terminated; it will restart from the beginning.

For more information, see “[Backing Up Clusters](#)” in the *NetWare 6.5 Storage Management Services Administration Guide*.

To back up cluster-enabled resources:

- 1 Load the SBICON modules.
See “[Loading SBICON](#)” on page 13.
- 2 Click Main Menu > Job Administration > Backup.
- 3 Click Target Service to select a cluster-enabled pool name.

To be able to select the target, you need to load the correct Target Service Agent (TSA). See “[Loading the Target Service Agents](#)” in the *NetWare 6.5 Storage Management Services Administration Guide*.

If you do not see the target you want on the list, check for these possible causes:

- The correct Target Service Agent is not loaded on either the host or the target. See “[Loading the Target Service Agents](#)” in the *NetWare 6.5 Storage Management Services Administration Guide* for LOAD commands.
- Network traffic is heavy. Press Esc to return to the Main Menu, and then press Enter again. Your target should now be listed.

- 4 Select a target from the Target Services list.
- 5 When prompted, enter the username (and context, if required) for the target.

If SBICON rejects the username you entered, you probably need to include the context where the User object is located. For example, instead of entering *ADMIN* as the username, enter *.CN=ADMIN.O=company_name* or *.ADMIN.company_name*.

You must include the context in the username at this point if the username you use exists in an eDirectory container that is different from the bindery context set on the server running the engine.

- 6 (Conditional) If requested, enter the password for the target.

SBICON will take a few moments to attach to that target.

If you select the default values on this form, a full backup of the source is performed. Otherwise, if you want to perform an incremental or differential backup, select Advanced Options. For more details on the Advanced options, see “[Customizing Backup](#)” on page 15.

- 7 Click What to Back Up and press Enter.
- 8 Press Insert, select the volumes and files you want to back up, and press Esc.
The selected volumes and files appear in the List Resources screen.
- 9 Enter a descriptive name for the backup session in the Description field.

This is a descriptive name of the job, which will help you identify the specific backup session; if a restore is necessary, you can easily identify the session you need. There is no special requirement for what to enter as the session description.

TIP: You might want to include the full path of the data (for example, `sys:home\reports\july.02`), which you will need to know if a restore session is necessary.

- 10** Click Device/Media Name and select a device.

A list of available objects is displayed in the Select a Device screen.

If you accept the default value, the engine selects the device and media which you have designated as the default.

NOTE: If there is only one media type available, it will be treated as the default.

If your device has more than one storage device attached, select an available device from the list. If the device contains multiple media, select the media for the backup.

If the storage media does not have a label, SBICON displays a message saying that the media cannot be identified. Set the label before selecting it for a backup job.

- 11** Select Advanced Options and set the desired values for all the fields.

For more details, see [“Customizing Backup” on page 15](#).

NOTE: If you set Enable Auto Recovery to NO in Cluster Options, the remaining options become invalid.

- 12** Select Append Session.

This option appears only if your device supports appending to previous sessions on the media.

Accept the default YES if you want to preserve all sessions on the media. The backup session is appended to the media at the end of the previous session. Each appended session has separate backup and error logs.

If you want to overwrite the data on the media, select NO. The media rewinds and existing data is overwritten by the next backup.

TIP: Labeled media is not considered empty media. No sessions are necessary on the media for you to set the Append option to Yes.

Delete the log and error files for any session you overwrite to avoid trying to restore a session that no longer exists.

- 13** Press Enter to save the settings and continue with the backup.

WARNING: To append a backup session to a media set (two or more tapes), use the tape with maximum space.

- 14** To return to the Main Menu, press Enter and then press Esc until you back out to the Main Menu.

- 15** To exit SBICON, press Esc again and answer the confirmation prompt.

2.3 Restoring Data Using SBICON

- ❑ Know the session description that you want to restore. You can get this information from your session log and error files. (See [Section 1.7, “Session Files,” on page 9](#).)

- ❑ For an Advanced Options restore session, ensure that you know the file system structure of the data you are restoring. You will be prompted for specific paths and filenames while setting the restore options.

If you restore the server-specific information from the file system backup of the failed server to a functioning server or location, you can use the vol\$info.txt file as a reference for this information.

- ❑ If you want to restore data to a new location (different from where the original data was located), you must specify the full path to both the original data and the new location. If the new location does not exist, SBCON will create a new file system structure.

You can get the original path from your backup logbook or from the session log files if you noted the path at the time the backup was performed.

- ❑ Replace faulty hardware or correct the problems that caused data loss (if applicable).
- ❑ Ensure that media is inserted in your storage device.

- 1 Load the drivers for your specific device and controller board.

See “**Before Running the Backup Software**” in the *NetWare 6.5 Storage Management Services Administration Guide*.

- 2 Load the appropriate Target Service Agents.

See “**Loading the Target Service Agents**” in the *NetWare 6.5 Storage Management Services Administration Guide*.

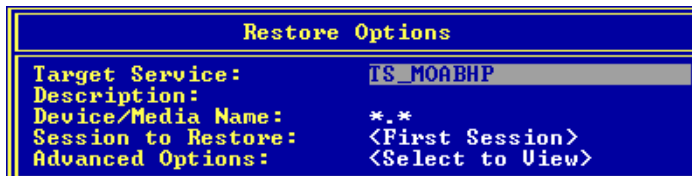
- 3 Load SBCON.

See “**Loading SBCON**” on page 13.

- 4 Select Main Menu > Job Administration > Restore.

The Restore Options screen appears.

Description: Restore Options screen



- 5 Select Target Service, then the NetWare or SLES server running your backup and restore Target Service Agent.

This is the name of the server on which you want to restore your data. Before selecting it, you must load the correct TSA. See “**Loading the Target Service Agents**” in the *NetWare 6.5 Storage Management Services Administration Guide*.

If you do not see the target you want on the list, check for these possible causes:

- The proper TSA is not loaded on the target.
- Network traffic is heavy. In these circumstances, it might take SBCON a few moments to detect all the targets. Press Esc to return to the Main Menu, and then press Enter again. Your target should now be listed. From the Target Services list, select a target.

If the target you select has more than one TSA loaded, SBCON shows you a list of their full names in the Backup/Restore Target Services on This Server.

NOTE: When you are trying to connect to a different server, SBICON uses the same username and password you gave the first time. It prompts only if it fails.

Target Service to Restore	Dataset to Select
Cluster-enabled pool	The cluster-enabled pool that you backed up
File system	The server whose file system you want to restore
eDirectory database	The server with TSANDS loaded
Server-specific information	The server whose server-specific information you want to restore and then the file system to restore

- 6** When prompted for the target username, enter your username (and context if required) as the network administrator for the target.

If SBICON rejects the username you entered, you probably need to include the context of where the user object is located. For example, instead of entering *ADMIN* as the username, enter a complete name such as *.CN=ADMIN.O=COMPANY_NAME* or *.ADMIN.COMPANY_NAME*.

You must include the context in the username at this point if the username exists in an eDirectory container that is different from the context set on the server running SBICON.

- 7** If a password is requested, enter the password for the target.

SBICON will take a few moments to attach to the target. Wait for the confirmation box, and then press any key to continue.

- 8** Enter a descriptive name for the restore session in the Description field.

The descriptive name of the job will help you identify the session.

- 9** Select the device and media for restore by pressing Enter at the Device/Media Name field, then decide where you want to restore from.

A list of available objects is displayed in the Select a Device screen.

If you enter **.* (DEVICE_NAME.MEDIA_NAME)*, the engine selects the device and media that it encounters first.

If your device has more than one storage device attached, select an available device from the list. If the device contains multiple media, select the media for the backup.

If the storage media does not have a label, SBICON displays a message indicating that the media cannot be identified. You should set the label before selecting it for a backup job.

- 10** On the Select a Session screen, select the Session to Restore.

WARNING: TSAFS backs up files in compressed or uncompressed format as specified by the user. However, if you try to restore a compressed file to a volume without compression, the file is corrupted and no error message is displayed.

- 11** Specify the path to the session log file of the session you want to restore.

Use one or more of the following methods:

- Press Enter to accept the default, then go to **Step 12**.
- Press Insert to select from a list of directories, press Esc to return to the previous window, and then go to **Step 12**.

- Press Backspace to delete path shown (or a portion of the path), type in a new directory or path, and then go to [Step 12](#).

Press Insert any time during this process to choose parts of the existing path from a list.

NOTE: At the present, it takes the default. The parts of the existing path can be chosen in the future release.

- 12** When a list of sessions is displayed, select the session you want to restore.

If the media on which the data resides is not loaded on the device you choose, you will be prompted to insert the correct media.

- 13** Select Advanced Options to make the selective restore.

The Advanced Restore Options screen appears. See [Customizing Restore](#). You can perform the advanced restore, specify the execution time, reschedule the job, etc., using this form.

- 14** Complete the Advanced Restore Options form.

- 15** Press Esc and answer the prompt at the Submit Job screen to begin the restore session.

- 16** Press Alt+Esc to view the activity log screen.

If the job execution starts and is not successfully completed, the error messages appear on this screen. The activity log file, activity.log, is located at the server's sys:\system\tsa\log directory.

- 17** To view the Run Time Status of a job, select Job Administration > Current Job List > *job name*.

- 18** When the restore session finishes, your screen display reads the following:

```
The restore process was completed normally.
```

- 19** To return to the Main Menu, press Esc as required.

The Esc key allows you to exit SBICON one screen at a time until you reach the Main Menu. If you want to exit SBICON, answer the confirmation prompt.

NOTE: To unload SBICON and applicable Target Service Agents, see [Section 3.9, "Unloading SBICON,"](#) on page 43.

2.3.1 Customizing Restore

Using the Advanced Restore Options form at the server, you can perform a custom restore of the database you need.

- 1** Select Main Menu > Job Administration > Restore.

The Restore Options screen appears.

- 2** Select Advanced Options.

- 3** Select Rename Data Sets to restore data to a location different from the backup location.

- 4** At the Restore Datasets to a Different Location screen, do the following:

4a Press Insert to select the namespace type.

4b Enter the source path (where the data originally was backed up from).

4c Enter the destination path you want the data restored to, in the entry box.

If the source or the destination target is a NetWare server, then the paths must include the volume names for network server.

IMPORTANT: When you specify a particular portion of the file structure as the source location, it does not necessarily mean that this will be the only data restored. What is restored can be influenced by the include and exclude settings on the Subsets of What You Want to Restore form. If you do not want to overwrite any subdirectories that might exist in the area you have included, you must specifically exclude them by their full path.

5 Select Subsets of What to Restore.

Use this screen to specify which parts of the file structure you want to restore. Various data sets to be included or excluded are listed in this form. You can include or exclude any or all items listed. For more information about including and excluding items, see [“Choosing Subsets of Data to Back Up” on page 47](#).

The screen lists major and minor resources. *Default* indicates that none of that type of subset has been specified.

6 To specify a subset:

6a Select any item on the screen.

6b Edit the Include or Exclude screens using Insert and Enter.

6c Press Esc to save changes.

6d To view a list of values associated with major TSA resources (for example, server or volumes) select either the include or exclude line.

The Selection List Options form appears. Any value you previously selected is shown on the form. If you did not select a value, the form is blank.

6e To select a value for this major resource, press Insert and select the value from the list that appears by pressing Enter.

7 Select Open Mode Options and select parts of the backed up data structure to be restored.

The backed-up data set contains various types of data that are listed on the screen. By default, all the types of data are included in the restore.

7a To exclude a particular type of data from the restore, select that line and type Y.

7b When all the data items are selected correctly, press Esc.

8 Specify whether to overwrite the existing parent by typing Y (Yes) or N (No).

For more information, see [“Overwriting a Parent or Child” on page 50](#).

9 Specify whether to overwrite the existing child by typing Y (Yes) or N (No).

10 Specify the execution time.

11 Select Scheduling to reschedule the job.

12 Press Esc as required and then select Yes to confirm the Submit Job? prompt.

The job is submitted and is listed in the Current Job List menu.

2.3.2 Restoring eDirectory

The procedures in the following sections are performed at the beginning of the restore process.

- [“Restoring a Volume Other Than Sys:” on page 24](#)
- [“Restoring Volume Sys: in a Single-Server Network” on page 24](#)
- [“Restoring Volume Sys: in a Multiple-Server Network” on page 24](#)

- [“Restoring the Entire eDirectory Tree Structure” on page 26](#)

Restoring a Volume Other Than Sys:

WARNING: Do not delete the Volume object for the failed volume from the eDirectory tree structure. The Volume object preserves any references that other objects (such as Directory Map and Queue objects) might have to that volume. If the Volume object is deleted and you have objects that depend on this volume, you must re-establish the relationships through a selective eDirectory restore. See [“Custom eDirectory Restore” on page 27](#).

- 1 Bring down the server.
- 2 Correct the problem.
- 3 Bring the server back up and re-create the volume.
- 4 Perform an advanced file system restore.
See [“Customizing Restore” on page 22](#) for the procedure.

Restoring Volume Sys: in a Single-Server Network

Because there are no replicas in a single-server network, you cannot recover any eDirectory information from a replica. After repairing or replacing the failed hardware, you must restore the entire NetWare environment, including eDirectory, from an SMS backup.

To restore a single sys: volume:

- 1 Correct the problem that caused volume sys: to fail.
- 2 Reinstall NetWare and eDirectory.
When NWCONFIG asks for the names for Organization objects immediately under the [Root] object, use the same names that previously existed in the eDirectory tree. Otherwise you will end up with new, empty containers in the restored eDirectory tree structure.
Make sure disk partitions are at least as large as they were before, and that the volumes are defined as before.
- 3 Restore eDirectory using [“Customizing Restore” on page 22](#).

Restoring Volume Sys: in a Multiple-Server Network

To restore sys: volumes on several servers:

- 1 Restore the server-specific eDirectory information file (servdata.nds) to another server on the network following the custom (advanced) file system restore (see [“Customizing Restore” on page 22](#)).
By default, the file is placed into the sys:\system*server_name* directory on the server you have selected.
- 2 Use the dsmisc.log file (part of the information restored with the server specific information) to see if the failed server had a master replica of any partition.
- 3 If the failed server had a master replica of any partition, select the server you want to hold the master replica and load DSREPAIR on that machine.
 - 3a Select Available Options > Advanced Options Menu.
 - 3b Select Replica and Partition Operations.

NOTE: Use the NDS Manager utility to perform regular partition operations.

- 3c** Select the partition you want to edit.
 - 3d** To see the list of servers that have replicas of that partition, select View Replica Ring.
 - 3e** Press Esc.
 - 3f** Select Designate This Server as the New Master Replica.
 - 3g** Repeat Steps 3a through 3f for each master replica that the failed server contained.
 - 4** (Conditional) If the failed server contained any replicas, remove them.
 - 4a** Select Available Options > Advanced Options > Replica and Partition Operations.
 - 4b** Select the partition the server held replicas of.
 - 4c** Select View Replica Ring.
 - 4d** Select the name of the failed server.
 - 4e** Select Remove This Server from the Replica Ring.
 - 4f** Enter the supervisor name and password.
 - 4g** Select Yes to continue.
 - 5** Exit DSREPAIR.
 - 6** Reinstall NetWare.
 - 6a** Begin the installation.
 - 6b** When prompted for DS install, select Create a New DS Tree and complete the installation.
 - 6c** Load NWConfig and remove DS.
 - 6d** Install DS when prompted for DS install and select Install into an Existing Tree.
 - 6e** When prompted to choose a eDirectory tree structure, press F5.
This allows you to choose to restore the servdata.nds file to the failed server.
 - 6f** To specify the path where the servdata.nds file exists, press F3 and enter the path.
-
- TIP:** If the information fits on a diskette, you can save the information on a diskette instead of another server on the network.
-
- 6g** Press Enter to accept the path.
 - 6h** Log in to the server that contains the servdata.nds file.
 - 6i** Log in to the eDirectory database.
 - 6j** If the start.ncf file of the failed server is different from the default, you can edit the default file.
 - 6k** You now can choose from the following:
 - To continue the install use the backup tapes instead of the files from the install, to finish restoring the information, press Enter.
 - To go back to the previous screen, press Esc.
 - To copy the files from the install and then restore the files from tape, press F3.
- 7** Restore the file system following the instructions in “[How SMS Restores Data](#)” in the *NetWare 6.5 Storage Management Services Administration Guide*.

Restoring the Entire eDirectory Tree Structure

To restore an entire network from a full backup in a multiple-server environment:

- 1 Reinstall NetWare on the first server.

By default, this server will hold the master replica of the [Root] partition.

When NWCONFIG asks for the names of Organization objects immediately under the [Root] object, use the same names that previously existed in the eDirectory tree.

In NWCONFIG, select Directory Options > Directory Backup and Restore Options to obtain the information.

If you do not use the same names, you will end up with new empty containers in the restored eDirectory tree.

When this installation is complete, you will have a working eDirectory tree containing one NetWare server with a master [Root] partition.

- 2 Add name spaces as required.
- 3 Install the remaining servers to complete a skeleton of your network.

Before restoring a full eDirectory session, you should create a skeleton of your network.

- All servers and volumes should be up and running.
- The eDirectory objects should exist in the eDirectory tree in the same context as before. (NWCONFIG prompts you for the container in which you want each server to be placed.)
- Make sure all servers are communicating with one another.
- Make sure time synchronization is working properly.

NOTE: If you can get some but not all of the servers backed up, you can still proceed with the restoration. However, you might see errors and experience problems because of eDirectory objects having dependencies that cannot be resolved.

The User object (Admin or equivalent) used to create the backup session must exist in the same container with the same password and eDirectory rights as when the backup was performed.

After this step is completed, you still have just one partition: [Root]. Because of the NWCONFIG program defaults, you now have two replicas of that partition. These are stored on the second and third servers you installed.

- 4 Restore eDirectory on one server using the information in the [Section A.2, “Backup Types,” on page 51](#).

eDirectory Restore Session Types

You can choose to restore eDirectory in one of the following ways:

- [“Single Server or Entire Tree Restore” on page 27](#)
- [“Custom eDirectory Restore” on page 27](#)
- [“Custom File System Restore” on page 27](#)
- [“Server-Specific Information Restore” on page 29](#)
- [“Single File or Directory Restore” on page 29](#)

Single Server or Entire Tree Restore

- 1 Restore the entire eDirectory session from your SMS backup.
You will have no session file to work from at this point. Choose the option to restore without session files.
- 2 Continue with [Step 15 on page 22](#) to [Step 19 on page 22](#) to restore eDirectory.

Custom eDirectory Restore

To perform a custom eDirectory restore:

- 1 Enter SBCON at the server console prompt.
- 2 Select Job Administration.
- 3 Select Restore Options > Advanced Restore Options > Subsets of What to Restore.
- 4 To specify a subset:
 - 4a Select any item on the screen.
 - 4b Edit the Include or Exclude screen using Insert and Enter.
 - 4c Press Esc to save your changes.
- 5 Specify whether or not to overwrite the existing parent or child.

A parent is a container. A child is an object, which is the lowest level of the eDirectory tree.

If you want to overwrite the parent or child that exists on the hard disk, regardless of whether the existing version or the backed-up version has the latest date, accept YES for parent, child, or both.

If you do not want to overwrite the parent or child that exists on the hard disk, regardless of whether the existing version or the backed-up version has the latest date, select the option (parent or child or both), and enter N.

- 6 Continue with [Step 14 on page 22](#) to [Step 19 on page 22](#).

Custom File System Restore

To perform a custom file system restore:

- 1 Enter SBCON at the server console prompt.
- 2 Select Job Administration > Restore Options > Advanced Restore Options > Subsets of What to Restore.

The screen lists major and minor resources. The word *DEFAULT* indicates that none of that type of subset has been specified.

- 3 To specify a subset:
 - 3a Select any item on the screen.
 - 3b Edit the Include or Exclude screen using Insert and Enter.
 - 3c Press Esc to save your changes.
- 4 (Conditional) If you want to exclude certain types of data from the restore session, select Job Administration > Restore Options > Advanced Restore Options > Open Mode Options, and then edit the form.

The backed-up data set contains the various types of data items listed on the screen. By default, all types of data items are included in the restore.

If you want to exclude any item, select it and enter Y. Press Esc when you are finished editing the form.

- 5** (Optional) Restore data to a different location on a different NetWare server.
 - 5a** Back up the data from the server where it resides.
 - 5b** Exit to the Main Menu.
 - 5c** Select Change Target to Back Up From or Restore To from the Main Menu.

See [Section 3.2, “Changing Your Target,” on page 33](#).

- 6** (Optional) Restore data to a different location within the backed-up server’s file system structure.

Follow these important rules about restoring to a new location:

- When you specify a particular portion of the file system structure as the source location, it does not necessarily mean that this will be the only data restored. You can influence what is restored by using the Include and Exclude options on the Choose Subsets Of What You’re Restoring screen (Job Administration > Restore Options > Advanced Restore Options > Subsets of What to Restore).
 - You can restore only to a new location in the name space that is supported by the drive you are restoring to.
 - If you do not want to overwrite any subdirectories that might exist in the area you have included, you must specifically exclude them by their full path.
- 6a** Go to Subsets of what you want to restore, press Enter, press Insert, select the name space you want, then enter the name you used for your backup at the Enter the Data Set Name field.
 - 6b** Enter the full directory path of the source including the volume name.
 - 6c** Enter the full directory path to the new destination.
 - 6d** Press Esc to save your changes.

NOTE: The eDirectory Target Service Agent (TSANDS) does not support restoration of data to a different location.

- 7** Specify whether to overwrite the existing parent or child.

A parent might be a server, a volume, or a directory. A child is a file, which is the lowest level of the file system structure.

If you want to overwrite the parent or child that exists on the hard disk, regardless of whether the existing version or the backed-up version has the latest date, accept YES for parent or child or both.

If you don’t want to overwrite the parent or child that exists on the hard disk, regardless of whether the existing version or the backed-up version has the latest date, select the option (parent or child or both), enter N.

If you want to overwrite the child that exists on the hard disk only if the date of the backed-up copy on the media is later than the date of the copy on the hard disk, select Overwrite Existing Child and select the option you want.

- 8** Continue through [Step 15 on page 22](#) to [Step 19 on page 22](#).

Server-Specific Information Restore

To view and restore server information:

- 1 Select Main Menu > Job Administration > Restore Options > Advanced Options > Subsets of What to Restore > Include Major TSA Resources.
The Selection List Options screen appears and is empty.
- 2 Press Enter to see the Selection List Options. Press Insert to see the server-specific information.
- 3 Select the Server-Specific Info and press Enter.
Esc returns you to the Selection List Options.
This will return you to the Choose Subset of the Session to be Restored screen.
- 4 Complete the form and press Esc.
This will return you to the Restore Options screen.
- 5 Complete the Restore Options form and press Esc.
The server-specific information will be restored to the `sys:\system\failed_server_name` directory of the server on which you are running SBICON.
- 6 Continue with [Step 15 on page 22](#) to [Step 19 on page 22](#).

Single File or Directory Restore

- 1 Select Main Menu > Job Administration > Restore Options > Advanced Options > Subsets of What to Restore.
- 2 Enter the full path and name of the file or directory, including full directory and volume names.
The following options appear:
Include/Exclude Directories (full path)
Include/Exclude Files
Include/Exclude Path/Files
- 3 Press Insert and enter the name space for the name space format you used when entering the file or directory name.
The name space allows SBICON to correctly interpret the path information entered earlier in this menu in either the directory field or the location field.

IMPORTANT: If files are restored to a new location, the name spaces must be the same or an error message will occur.

You can restore to a new location only in the name space that is supported by the drive to which you are restoring.

The supported name spaces are DOS, Macintosh, NFS, and Long.

SBICON provides a list of the name spaces currently loaded on the target to which you are restoring.

For example, if you are restoring to a new Macintosh location, enter a path, (such as `sys::test.monday`) and then enter *Macintosh* as your name space.

- 4 (Optional) Restore to a new location (located in Rename Data Sets).
 - 4a Enter the source path, including the volume name, to the target directory (a location different from where the data was backed up). Enter `volume:/directory/directory`

- 4b** If the new location you are restoring to is a different NetWare server, do the following:
 1. Back up the data from the server where it resides.
 2. Exit to the Main Menu.
 3. Change your target to the server you want to restore the data to. See [Section 3.2, “Changing Your Target,”](#) on page 33.
- 5** Continue with [Step 15 on page 22](#) to [Step 19 on page 22](#).

Completing the eDirectory Restore

If you restored the eDirectory database to volume sys:, you should complete the restoration for the following to make sure the eDirectory database is working properly:

Volume Other than Sys:

To finish restoring eDirectory on a volume other than sys:

- 1** Bring the server up.
- 2** (Optional) Verify proper restoration of the data, trustee assignments, file ownership, and other related information by spot-checking some of the restored directories and files.

Single-Server Network

To finish restoring eDirectory on a server:

- 1** Restore the full file system following the information in [Section 2.3, “Restoring Data Using SBCON,”](#) on page 19.
- 2** (Optional) Verify proper restoration of the data, trustee assignments, file ownership, and other related information by spot-checking some of the restored directories and files.

Multiple-Server Network

To finish restoring eDirectory on multiple servers:

- 1** Restore replicas to the server.

The dsmisc.log file, which is created when the servdata.nds is restored, contains the partition and replica information that resided on the failed server at the time of the backup. This will show you what replicas were on the server when it failed.
- 2** (Optional) Verify proper restoration of the data, trustee assignments, file ownership, and other related information by spot-checking some of the restored directories and files.

Commands that might be helpful include rights/t /s (displays users, groups and other objects that have explicit trustee assignments in a directory and its subdirectories) and ndir (displays owners and other NetWare file information).

Entire Tree

To finish restoring eDirectory on the tree:

- 1** Restore the file system information to each server following [“How SMS Restores Data”](#) *NetWare 6.5 Storage Management Services Administration Guide*.
- 2** Re-create partitions and replicas.
- 3** (Optional) Verify proper restoration of the data, trustee assignments, file ownership, and other related information by spot-checking some of the restored directories and files.

Commands that might be helpful include `rights/t /s` (displays users, groups and other objects that have explicit trustee assignments in a directory and its subdirectories) and `ndir` (displays owners and other NetWare file information).

Partial eDirectory Restores

Certain conditions might arise in special cases involving the backup and restoration of eDirectory information.

The SMS TSA software allows you to do selective restores from the backup media. However, partial restoration of eDirectory from a backup can have many subtle consequences, particularly when only a single object or a selected group of objects is restored.

For partial eDirectory restores, keep these two main issues in mind:

- **Object ID numbers** – If you restore objects that no longer exist in the eDirectory tree, those objects receive new ID numbers when restored. New object IDs affect file system trustees, print queue directories, user mail directories, etc.

If you restore objects on top of objects that exist in the eDirectory tree, the objects do not receive new ID numbers. These objects' current attribute and property information is overwritten with previous information from the SMS backup.

- **Objects that depend on other objects** – In the eDirectory schema, objects are defined to have certain attributes. Some of these attributes are mandatory (meaning they must contain a value); others are optional.

For some eDirectory objects, the value for a particular attribute is a reference to another object upon which the object depends. For example, Queue object has a Queue Directory attribute that contains the file system path to the queue directory. It also has a Host Server attribute that identifies the file server on which the queue directory resides. This information is used to determine the physical location of the resource.

The specifics of restoring objects vary depending on what type of object is involved and whether the object's dependencies are physical entities (servers and volumes) or logical entities.

In some cases, you can simply restore an object and everything will work fine. In other cases, an object might be restored but not be functional unless you first restore its dependent objects.

2.3.3 Restoring Cluster-Enabled Resources

Restore of cluster-enabled resources is similar to a normal restore session.

See “[How SMS Restores Data](#)” in the *NetWare 6.5 Storage Management Services Administration Guide*.

NOTE: Auto recovery of the restore session on failover or failback is currently not supported.

Managing SBCON

This section provides a brief overview and specific information on managing your jobs, data, devices, reports, and so forth. Although the screens might look different, you can perform the same tasks in each interface.

Be sure to read [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#) before performing any tasks in this section.

- [Section 3.2, “Changing Your Target,” on page 33](#)
- [“Administering Jobs” on page 34](#)
- [Section 3.4, “Administering Storage Devices,” on page 35](#)
- [“Erasing or Retaining Media” on page 38](#)
- [Section 3.5, “Spanning Storage Media,” on page 38](#)
- [Section 3.6, “Managing Log and Error Files,” on page 39](#)
- [Section 3.7, “Creating Session Files,” on page 42](#)
- [Section 3.8, “Verifying Backup Data,” on page 42](#)

3.1 Prerequisites for Performing SBCON Tasks

Before you can manage any backup tasks, ensure the following:

- Drivers for your specific device and controller board are loaded.
- SBCON files for your specific target are loaded.
- The media is inserted into your storage device.
- You can see the SBCON Main Menu on your server console.

3.2 Changing Your Target

Any time you are performing a series of backup or restore sessions, you might need to change your target. This can be easily done from the SBCON Main Menu.

If you do not specify a new target, SBCON automatically selects the target used during the last session and continues without asking you to make a selection.

- Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).
- Load the required TSA. (See [“Loading the Target Service Agents”](#) in the *NetWare 6.5 Storage Management Services Administration Guide*.)

To change the target:

- 1 Select Main Menu > Change Target to Back Up From or Restore To.
- 2 Select one server.
- 3 From the list of Target Service Agents, select a target.

If the target you select includes more than one TSA loaded, SBCON will show you a list of their full names.

- 4 Enter the username and password for the target you just selected.

The target is successfully changed.

3.3 Jobs

The backup or restore jobs created by you can be administered anytime. You can delete, hold, reschedule, cancel, or enable a job.

3.3.1 Administering Jobs

On the SBCON Main Menu at the server, the Current Job List option gives you a job management facility where you can delete a job, hold a job, or enable it if it has been disabled after a job failure. You can also monitor the status of the backup/restore jobs you have submitted.

Current Job List provides the following information about all jobs submitted.

- **The name of the server from which the job was submitted** . See [“Viewing the Job Queue” on page 34](#).
- **The job name that you entered on the Backup Options form** . The job name can be changed using the Job Details screen if you are rescheduling it to run another time and you want to change the name. See [“Viewing Job Details” on page 34](#).
- **The Hold status** . If you want to prevent a prescheduled job from execution, you can put it on Hold. See [“Postponing a Job” on page 35](#).
- **The job status**. You can see whether it finished the execution of the request, or if it was submitted for execution at a later time. Other statuses are: active currently, could not run, processing, failed, and success. The log of each of these status reports can be viewed using the log and error reporting. For more details see [Section 3.6, “Managing Log and Error Files,” on page 39](#).

3.3.2 Viewing the Job Queue

- 1 Select Main Menu > Job Administration > Current Job List.

The Queue Jobs screen displays a list of all jobs, showing each job name, hold status, status of the job, and name of the server from where the job was submitted.

3.3.3 Viewing Job Details

This screen gives you all the details of the job you submitted including job name, the time the job was submitted, and the time the job should be executed. You can also schedule the job to run again at a predefined time after its execution.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 Select Main Menu > Job Administration > Current Job List.
- 2 Select one of the jobs listed and press Enter.

The Job Details screen appears, displaying the following information:

- **Job Name** – A descriptive name of the job for your identification. You can change the name if you want to reschedule the job and run it again.
- **Disabled** – Indicates whether the job is disabled. If it is, this field displays `Yes`; if enabled, it displays `No`. Updates to this field depend on the job status. If the job status is `Could Not Finish`, the message is `Yes`. You can perform the required troubleshooting and change this field to `No`, subsequently allowing the job to execute. After completion of the job, the `Disabled` field indicates `Yes`.
- **Submitted By** – The name of the server where you have submitted the job.
- **Submitted at** – The date and time the job was submitted. The execution time could be different depending upon the specifications you defined in `Execution Time` and `Scheduling Options` in the same screen.
- **Entry Open** – The status is `Yes` when the job is active and `No` when it is inactive. This is one of the fields that is updated automatically.
- **Execution Time** – An option to give the time and date when you want the job to run. It is the same as the `Execution Time` in the `Advanced Backup Options` form.
- **Serviced By** – This indicates the name of the server where the job is to be executed. From a single server, you can submit jobs to various servers. This field indicates which job is serviced by which server. This field is active only when the job is active; otherwise, it indicates `None`.
- **Scheduling Options** – You can schedule the same job to run at another time. For information, see [“Customizing Backup” on page 15](#).
- **Session Report** – Press `Enter` at this field to view the session log report or the session error report for the particular session you selected. The same information can be seen in the `Error Log File` where it gives a log of all the jobs. For information, see [“Viewing a Log File” on page 39](#).

3.3.4 Postponing a Job

This task lets you to place a job on hold.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 Select `Main Menu > Job Administration > Current Job List`.

The `Queue Jobs` screen appears with a list of jobs.

- 2 Select a job and press `Tab`.

The job is on hold if `Hold` is displayed in the column. If no status is displayed, it is ready for execution at the time you configured it. Press `Tab` to toggle holding a job.

3.4 Administering Storage Devices

The `Storage Device Administration` option of the `SBCON Main Menu` lists the devices and the media you can access.

You can perform the following administrative tasks:

- [“Checking the Device Status” on page 36](#)
- [“Changing the Device Label” on page 36](#)

- [“Viewing the Media List” on page 37](#)
- [Section 3.5, “Spanning Storage Media,” on page 38](#)

SBCON supports autoloader, which holds multiple media within a magazine. Every magazine has slot numbers given by the manufacturer and each slot holds a single medium. This is extremely useful when you are backing up a large server. If one medium is fully written, the SME automatically writes to the other available media.

IMPORTANT: Any media under a device becomes inaccessible if a job is running on it because it is reserved by the engine. Any job scheduled to be executed at that instance will fail.

3.4.1 Checking the Device Status

The Device Status screen displays information about the current status of a device, such as read, write, and format. It also gives information on the storage capacity.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 Select Main Menu > Storage Device Administration.
- 2 Select a device and press Insert.
- 3 Select Utilities > Device Status.

The Device Status screen is displayed listing the following information:

- **Current Operation**— Indicates whether the device is currently reading, writing, formatting the media, or none of these.
- **Device Mode**—Indicates whether the device is selected for reading, writing, or both.
- **Maximum Capacity**— Indicates the total storage capacity of the media currently present in the device.

- 4 Press Esc when you are finished to return to the Main Menu.

3.4.2 Changing the Device Label

The default names for storage devices are controlled by the device manufacturers. These names are often not descriptive, so you change the name of the device during multiple backup sessions. However, this change is temporary, and it is lost after a reboot. If you have several devices, it might be difficult to remember which name goes with which device. For this reason, renaming storage devices is helpful.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 Select Main Menu > Storage Device Administration.
- 2 Select a device name and press Insert.
- 3 Select Utilities > Change the Device Label.
- 4 Enter the new name in the field.
- 5 Press Esc as required to return to the Main Menu.

3.4.3 Viewing the Media List

This task allows you to view your list of devices.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 Select Main Menu > Storage Device Administration.

A list of devices is displayed.

If no device is displayed in the list, run `LIST DEVICES` at the server prompt.

- 2 Select a device name and press Enter.

The List of Media screen appears, displaying the following information:

- **Slot** – The slot number given by the manufacturer.
- **Media name** – The name of the media, which can be changed using the Utilities menu. See [“Erasing or Retaining Media” on page 38](#).
- **Number** – The sequential number of the media (tape) in a particular backup set. SBCON automatically labels and appends an incremental number to any backup session that spans multiple media.

TIP: It takes a lot of time to display the media in an Autoloader. However, after the media list is displayed, press Tab to access it. This will not rescan the device for new media. Press Enter only when you remove or add media.

3.4.4 Checking the Media Status in a Device

This task lets you check the status of a particular media type.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 Select Main Menu > Storage Device Administration.

- 2 Select one device from the list.

- 3 Select one media and press Insert.

- 4 Select Utilities > Media Status.

A screen is displayed listing the following information:

- **Number in Media Set** – The sequential number of the media within a particular media set.

SBCON automatically labels and appends an incremental number to any backup sessions that span multiple media.

- **Creation time** – The time the current media label was first used on this media.
- **Mount status** – Whether the media is Mounted (ready for reading or writing). There are two status messages:

`Mount Pending`: The request to mount is waiting to be processed.

`Not Mounted`: The media is not ready to access.

- **Media mode** – Whether the media is selected for reading, writing or both, or whether the mount request is pending.
- **Media type** – The type of media in the device, such as 4mm DDS (Digital Data Storage) tape, or 8mm tape.
- **Total capacity** – The total capacity of the media, if known. Sometimes it is not displayed, depending on the media manager.

The type of media manager controls the display of the total capacity of the media.

- 5 Press Esc when you are finished to return to the Main Menu.

3.4.5 Erasing or Retaining Media

This task erases media headers, erases all data on the media, or retains media in tape devices.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

Option	Explanation
Change the Media Label	This is permanent. Blank media (tape) does not have a label. Before submitting a job to the media, you need to label it.
Erase the Media	This option erases the tape completely. It might take up to two hours, depending on the size of the media.
Erase the Media Header	This is a quick method of making the media appear blank. Although it is less secure than erasing all the data, this method is quick and effective.
Media Status	This option lets you view the status of the media.
Move the Media	This option moves the media from one slot of an autoloader to another slot. It is not a valid operation on a single media device.
Retention of Media	This option is for tape devices that allow retention (for example, 0.25-inch cartridges). This rewinds the tape, which might resolve a problem reading the tape. An error appears if the driver does not support this method on the device.

- 1 Select Main Menu > Storage Device Administration.
A list of devices is displayed.
- 2 Select one device from the list.
- 3 Select one media and press Insert.
- 4 Select Utilities > Erase the Media [or] Retention of Media.

3.5 Spanning Storage Media

If the storage media you are using does not have enough space for the entire backup, SBCON will span the media, prompting you to insert additional media when the first medium is full.

TIP: Always have extra media on hand in case the backup session spans more than one medium.

SBCON designates the first media as label #1 and increments any subsequent medium with the same label.

WARNING: To help safeguard your network, SBCON disconnects from the target when a delayed backup is complete. If the delayed backup session cannot fit on the media, SBCON prompts you to insert additional media. If additional media are not inserted, the backup does not finish and SBCON does not disconnect, thereby compromising security.

3.6 Managing Log and Error Files

SBCON keeps a list of all the log and error files, which show specific information about the backup and restore session. See [Section 1.7, “Session Files,” on page 9](#) for more information.

You can manage these files as follows:

- Create these files.
See [“Creating Log and Error Files” on page 39](#) for information.
- View information contained in the log and error files.
See [“Viewing a Log File” on page 39](#) and [“Viewing an Error File” on page 40](#) for information.
- Change the location of these files.
See [“Setting the Location of Backup Log and Error Files” on page 41](#) for information.
- Delete these files.
See [“Deleting the Log Files” on page 41](#) for information.

3.6.1 Creating Log and Error Files

If you do not know what is on the media, or you have lost or deleted the log and error files, you can re-create them.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

To create a log or error file, see [Section 3.7, “Creating Session Files,” on page 42](#).

3.6.2 Viewing a Log File

This task lets you view your log file for backup and restore information. The log file is created on the host server the first time data is backed up or restored and contains details about the session.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 From the SBCON Main Menu, select Log File Administration > View a Log File.
- 2 If necessary, set the location of the log and error files for a backup session. (This option is not supported for a restore session.)

To set the location, use one or more of the following methods:

- Press Enter to accept the default location, and then go to [Step 3](#).

- Press Insert to select from a list of network directories, select a directory, then press Esc to return to the previous window, and then go to [Step 3 on page 40](#).
- To change the directory, delete the existing directory path and type a new one, then go to [Step 3](#).

You can also press Insert during this process to select existing parts of the path from a list. The backup log displays all supported name space types. The creator name space is the first in the group and a right-angle bracket (>) appears next to it.

If you have linked UNIX files, SBICON retains both symbolic and hard links created under the NFS name space type, but links are not listed in the backup log. Restoring the original file restores associated links.

- 3 To return to the Main Menu, press Enter and then Esc.

The Esc key allows you to exit SBICON one screen at a time until you reach the Main Menu. If you want to exit SBICON, press Esc again and answer the confirmation prompt.

3.6.3 Viewing an Error File

An error file records any errors that occurred during the backup or restore session. (See [Section 1.7, “Session Files,” on page 9](#).)

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBICON Tasks,” on page 33](#).

- 1 From the SBICON Main Menu, select Log File Administration > View an Error File.
- 2 If necessary, set the location of the log and error files for a backup session. (This option is not supported for a restore session.)

To set the location, use one or more of the following methods:

- Press Enter to accept the default location, then go to [Step 3](#).
- Press Insert to choose from a list of network directories, choose a directory, press Esc to exit and then go to [Step 3](#).
- To change the directory, delete the existing directory path and type a new one, then go to [Step 3 on page 40](#).

You can also press Insert during this process to select existing parts of the path from a list.

Restore errors are appended to a session’s backup error file. A `Restore Session Begins` message marks the beginning of the restore errors, if any exist.

If you linked UNIX files, symbolic and hard links created under the NFS name space type might not be restored if the pathname is not recognized. When this happens, the error file contains messages similar to the following:

```
Error restoring namespace specific information of XXXX:tmp/hosts in
NFS namespace, error 0x7!
Unable to allocate directory handle for XXXX:tmp/test!
```

- 3 When you are finished viewing the file, press Esc.
- 4 To return to the Main Menu, press Esc as required.

The Esc key allows you to exit SBICON one screen at a time until you reach the Main Menu. If you want to exit SBICON, press Esc again and respond at the confirmation prompt.

3.6.4 Setting the Location of Backup Log and Error Files

Every time you do a backup, you are required to set a location (or directory path) for the log and error files. The restore log and error files are always located in the directory, `sys:system/tsa/restore`.

You can set the location when requested in the backup procedures, or you can use the following method prior to beginning the backup procedures.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 From the SBCON Main Menu, select Log File Administration > Set Location of Log and Error Files.
- 2 Set the location using one or more of the following methods:
 - Press Enter to accept the default location, then press Esc to return to the Main Menu.
 - Press Insert to select from a list of network directories, select a directory, then press Esc twice to return to the Main Menu.
 - Press Backspace to delete the path shown (or a portion of the path), type a new directory or path, press Enter, and then press Esc to return to the Main Menu.

You can also press Insert during this process to select existing parts of the path from a list.
- 3 Press Esc when finished to return to the Main Menu.

3.6.5 Deleting the Log Files

SBCON allows you to overwrite sessions and reuse storage media.

When you delete the log file for a session using the following procedure, you automatically delete the corresponding error file as well.

To prevent outdated session information from taking up disk space and to help prevent confusion when you select sessions to view or restore, delete the session log files for any session that has been overwritten.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

To delete the log and error files:

- 1 From the SBCON Main Menu, select Log File Administration > View a Log File.
- 2 If you have not set the location of log and error files, do so now using one or more of the following methods:
 - Press Enter to accept the default location, then go to [Step 3 on page 41](#).
 - Press Insert to select from a list of directories, select a directory, press Esc to return to the previous window, then go to [Step 3 on page 41](#).
 - Press Backspace to delete the path shown (or a portion of the path), type a new directory or path, and then go to [Step 3 on page 41](#).

You can also press Insert during this process to select existing parts of the path from a list.

- 3 Select the description of the session that you have overwritten (or plan to overwrite) and press Delete.

A confirmation prompt is displayed.

- 4 To delete the log and error file for that session, click Yes.
- 5 Press Esc when finished to return to the Main Menu.

3.7 Creating Session Files

If you do not know what is on the media, or you have lost or deleted the log and error files, you can re-create them from the server.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

To create a session file:

- 1 From the SBCON Main Menu, select Job Administration > Create Session File.

The Session Files Options screen appears.

- 2 Enter a descriptive name.
- 3 Select the media you will be using.

If you have only one medium loaded, press Enter to accept the default.

- 4 To verify the media, press Enter.

SBCON reads the media and shows you the selected session.

- 5 Confirm the creation of the session files.

If the session selected is the session you want for log and error file creation, click Yes, Create Files for This Session.

If the session selected is not the session you want for log and error file creation, click No, Go to the Next Session.

If you elect to create session files, they will be created in the location you chose.

3.8 Verifying Backup Data

This option allows you to check the data on the media to make sure it has been backed up properly, and to check later that the data is valid and can be restored.

You can verify the backup data in two ways:

- If you know what sessions are on the media and you have the log and error files, you can select the session from the list.
- If you do not know what sessions are on the media, and if you are not sure the log and error files still exist, you should create the session files.

Ensure that you have met the prerequisites detailed in [Section 3.1, “Prerequisites for Performing SBCON Tasks,” on page 33](#).

- 1 Select Main Menu > Job Administration > Verify

The Verify Options screen appears.

- 2 Enter a descriptive name for the verify job.
- 3 Select the device and media of the job.

You can also manually enter this in the form *device name.media name*.

- 4 Press Enter in the Session to Restore field.

A list of all backup sessions is displayed in the Select a Session screen.

- 5 Select a session from the list.
- 6 Submit the job after confirming the Submit Job? prompt.
- 7 Select Job Administration > Current Job List.
- 8 Select the job you have submitted.

If there were no problems with the verification or the data, the Run Time Status screen displays the following message:

```
The verification process was completed normally.
```

3.9 Unloading SBICON

To ensure maximum memory utilization and throughput, you should unload backup software and other Storage Management Services™ modules when you are finished performing your backup. That way, more memory will become available on your host or target.

- 1 Exit SBICON from the Main Menu.

Press Esc until you reach the SBICON Main Menu; then press Esc again and confirm the prompt.

- 2 Unload all the modules by entering the following command at the server console:

```
smstop
```

This unloads all the previously loaded SMS modules.

WARNING: The system displays a warning message on the console if you attempt to unload a module being used by another NLM™. If you continue, your server might abend.

This section includes information that you can use to troubleshoot common backup and restore problems.

- [“The media owner is unidentified” on page 45](#)
- [“Unable to find the session log file you want” on page 45](#)
- [“Pressing Insert on a device list does not produce a media list at the server” on page 45](#)
- [“The Time Form Is Invalid message displays when you try to schedule a delayed backup” on page 45](#)

4.1 Common Backup and Restore Problems

The following section lists common backup and restore problems.

The media owner is unidentified

Possible Cause: Media is blank or was written in a non-SIDF format.

Action: See [“Checking the Media Status in a Device” on page 37](#).

Unable to find the session log file you want

Possible Cause: The log file might be in a different directory or you might have deleted it accidentally.

Action: See [“Deleting the Log Files” on page 41](#).

Pressing Insert on a device list does not produce a media list at the server

Possible Cause: No medium has been selected.

Action: Use the Select option at the bottom of the screen.

The Time Form Is Invalid message displays when you try to schedule a delayed backup

Possible Cause: The date has been entered incorrectly in the time form.

Action: Check that the scheduling has been entered correctly.

Incremental or differential backups on SLES work like full backups.

Explanation: Incremental and differential backups on SLES are not supported.

Action: Use the modified date and time filters to achieve similar functionality.

TSA Features

This section provides information about the various options to modify the backup settings, and the types of backup.

A.1 TSA Options

The following TSA options are discussed in this section.

- “Backup Options” on page 47
- “Restore Options” on page 50

NOTE: The following options discuss NetWare specific paths; on SLES the NFS name space can be used to represent the same. The NFS name space on SLES takes the /directory/directory/filename format.

A.1.1 Backup Options

All backup types contain advanced options to allow you to customize your backup. These options allow you to perform the following tasks.

- “Choosing Subsets of Data to Back Up” on page 47

You can choose specific subsets of a data set to exclude from or include in the backup session by selecting major resources, such as volumes, files, directories, or path.

- “Scanning Data Sets” on page 49

You can specify how to scan what you are backing up.

Choosing Subsets of Data to Back Up

Whenever you perform a custom backup or restore, you can use the exclude and include options to select subsets of what you want to back up.

Whether you use exclude or include usually depends on the size of the data you want to back up, compared to the size of the data you do not want to back up.

Exclude

To back up most of the file system structure or Novell® eDirectory™ tree structure while omitting only a small part, use the Exclude option to omit the part you do not want to back up. Everything that you do not specifically exclude is included.

After you exclude part of the structure such as a volume, directory, or container, you cannot include any subdirectories, files, or objects beneath that excluded volume, directory, or container.

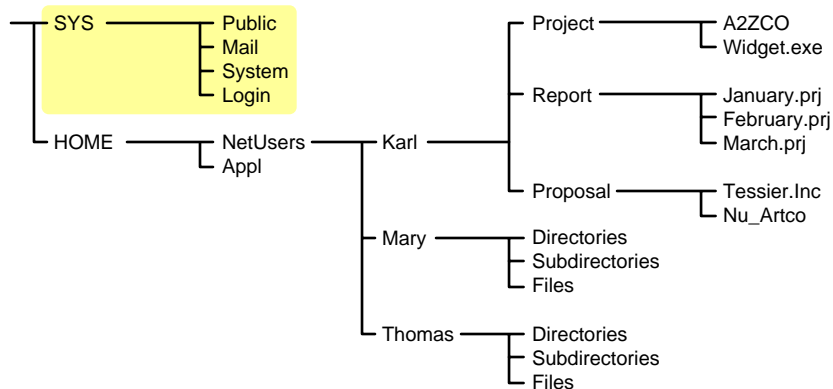
Include

To back up a small part of the file system structure, use the Include option to specify the data you want. Everything you do not specifically include is excluded.

When you select only part of the file system structure to include (such as a volume), all directories, subdirectories, and files under that selection are included in the backup by default.

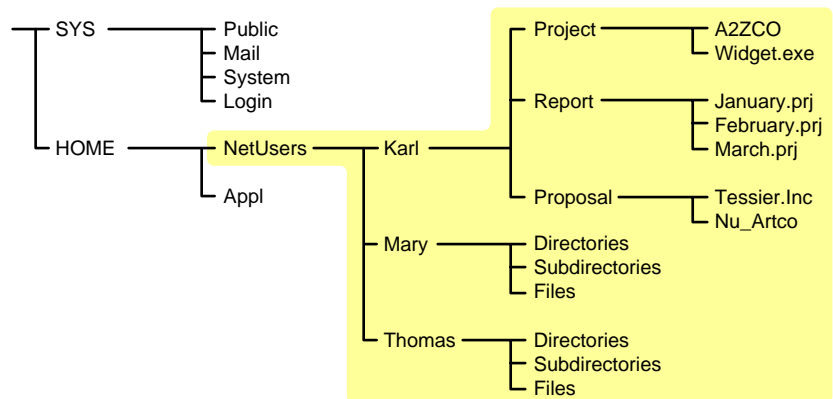
In the figure shown below, volume sys: is selected as an Include option. All other areas of the file system structure are excluded from the backup. You can exclude some subdirectories or files beneath your selection if necessary.

Description: Include option with a specific volume included, and all others excluded



The same principle applies when you specify a directory with the Include option. The figure below shows that all directories, subdirectories, and files under the NetUsers directory are included in the backup. All other areas of the file system structure are excluded from the backup.

Description: Include option with a specific directory included, and all others excluded



The reverse is true when you select a major TSA “resource”, a directory, or a file as an exclude option. All other areas of the file system structure are included in the backup.

Combining Include and Exclude Options

By combining the include and exclude options, you can control what is backed up.

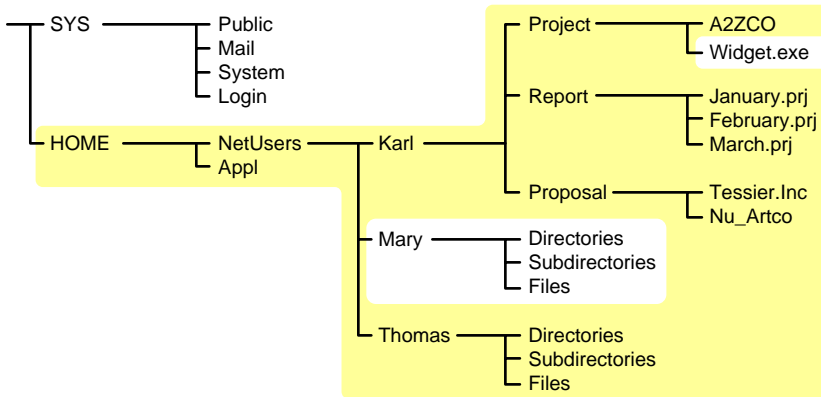
For example, the following command sequence results in volume home being included in the backup with the exception of the mary directory and the widget.exe file.

Include major TSA resources home:

Exclude directories (full path): home:netusers/mary

Exclude path/files home:netusers/karl/project/widget.exe

Description: Example combining SBCON Include and Exclude options



Scanning Data Sets

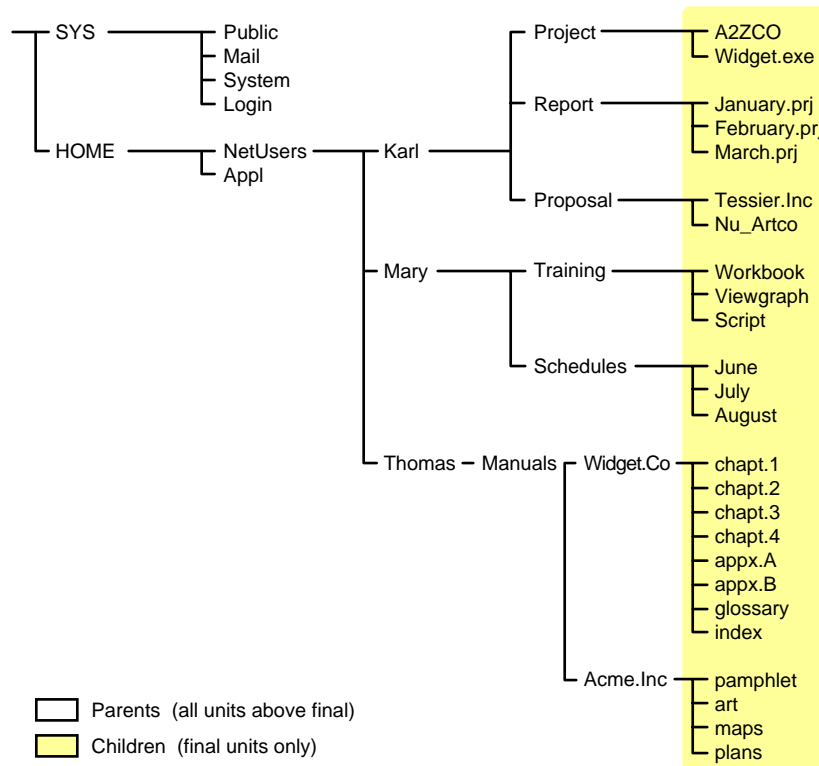
You can specify a different type of ““data set”” to be scanned.

A data set is a group of data that can be manipulated by SBCON. Each data set in the file system structure can be classified as a parent or a child, and each class includes different types of data items.

Within SBCON, a parent might be a server, eDirectory, a volume, or a directory. A child is a file, which is the lowest level of the directory structure.

The unit below a parent is not necessarily a child; it might be another parent, or the line might end with the parent. The unit above a child must always be a parent.

Description: Parent and child levels in a file system



Items in a data set for either a parent or child should be items that do not frequently change. You might choose to exclude from the backup session one or more items in the data set of your target.

Overwriting a Parent or Child

SBCON allows you to overwrite all existing parents or children. Children can be overwritten only if the date on the data set on the hard disk is more recent than the date of the data set backup.

A.1.2 Restore Options

For a custom restore session, you can specify exactly which data to restore. Several options work together to allow you maximum flexibility in your restore session. These options allow you to do the following:

- Choose subsets of data to restore
- Open mode options
- Overwrite an existing parent (such as a container) or child (such as an object)

Subsets of Data to Restore

You can choose specific subsets of a backup session to include in or exclude from the restore session by selecting major resources (such as volumes, server-specific info, or containers) or minor resources (such as directories, paths, files, or objects).

For more information about including and excluding, see [“Backup Options” on page 47](#).

Open Mode Options

Open mode options allows you to customize data for restore. File system data can either be included or excluded for the session. The speed of the restore depends on the options you set.

Overwriting Existing Parents or Children

Be careful when you perform a selective restore and choose whether to overwrite existing parents or children, especially eDirectory objects. Objects such as groups and users have references to other objects in the eDirectory tree structure that will be affected by a selective restore.

For example, suppose a part of the eDirectory tree structure gets corrupted and several users are deleted from the tree. There is a group that contains those users, but when the users are gone, the group purges the membership list to remove those users; the group, however, continues to exist in the eDirectory tree structure.

If you perform a selective restore and choose not to overwrite existing objects, the group membership list remains empty even if you restore the users. You need to either add the users manually to the group membership list or restore the original group.

A.2 Backup Types

SBCON has three types of backup sessions:

- **Full backup** —Backs up the entire file system of the selected target regardless of whether the data has changed since the last backup, and clears the “**Modify bit**” after the backup.
- **Differential backup** —Available only for the file system; backs up only data that has been changed since the last full or incremental backup. When you perform a differential backup, the modify bit is not cleared after the backup. All files modified since the last full backup are included in the backup (unless they have been deleted). Each differential backup uses more media and is slower than an incremental backup because it backs up more files.

IMPORTANT: Do not interchange differential backups and incremental backups. If you do, the differential backup will not contain all changes since the last full backup. Use full backups interspersed with differential backups or full backups interspersed with incremental backups.

- **Incremental backup** —Available only for the file system; backs up only data that has been changed since the last full or incremental backup (whichever was last). Incremental backup sessions back up only files that have the modify bit set (that is, files that changed since the last full or incremental backup session when the modify bit was cleared).

NOTE: While backing up SLES file system mount points, the modify bit based incremental and differential backups are not supported. Use the modify date and time options to achieve the incremental and differential backups.
