IBM TotalStorage SAN File System
(based on IBM Storage Tank™ technology)

IBM

Basic Configuration for Quick Start

Version 2 Release 1

IBM TotalStorage SAN File System
(based on IBM Storage Tank™ technology)

Basic Configuration for Quick Start

Version 2 Release 1

Contents

About this guide

This book provides information to perform a basic configuration to quickly start and gain some experience with SAN File System after installation. To use this book, you should be familiar with basic IBM® TotalStorage® SAN File System concepts.

For more detailed information about managing SAN File System for your installation, see *IBM TotalStorage SAN File System Administrator's Guide and Reference*. Also, to learn about any changes that were not available at the time this publication was produced, see *IBM TotalStorage SAN File System Release Notes*, available at: www.ibm.support.com/storage/support.

Chapter 1. Creating a storage pool

Perform the following steps to create a storage pool.

1. Using your Web browser, connect to the SAN File System Console.

2. In the My Work frame, click **Manage Storage** ⟶ **Create a Storage Pool**. View the list of steps to create a storage pool and click Next.

3. Under **Pool Settings** in the Create a Storage Pool panel, fill in the **Name** field (for example, My_New_Pool) and the **Description** field (for example, A pool I created). Optionally, select **Logical Partition Size**, **Allocation Size** and **Usage Threshold**. Click **Next**.

4. Under **Select Client**, select a client and a fetch method to gather the available LUNs information for the next step, adding volumes to the storage pool. The default fetch method is to gather the LUN information from cache, you could also choose to rediscover the LUNs by selecting the Rediscover button. Click **Next**.

5. Under **Add Volumes**, select a LUN (for example, vpd83naa5=12234678) from the table. Click **Next**.

6. Under **Volume Settings**, fill in the **Volume Name Prefix** field (for example, My_New_Pool), and click **Next**.

7. Verify your settings, and then click **Finish**.

Chapter 2. Creating a fileset for AIX

Perform™ the following steps to create a fileset for AIX®.

1. In the My Work frame, click **Manage Filing → Create a Fileset**.

   • In the Create a Fileset panel:

   a. Fill in the **Name** field (AIX_Fileset), the **Description** field (for example, A fileset for AIX-only files), and select a server (for example, ST0) from the drop-down list.

   b. Under **Attach Point**, fill in the **Directory Path** field (for example, sanfs) and the **Directory Name** field (for example, aix51). Click **OK**.

   • Optionally, select a **Server Assignment Method** and **Quota Options**.

2. Click **Manage Filing → Filesets**. Verify your new fileset in the list.

3. Grant root privileges to the client by clicking **Manage Servers and Clients → Client Sessions**.

   a. In the Client Sessions panel, Select a client, select **Grant Clients Root Privileges** from the drop-down list, and then click **Go**.

4. On the IBM AIX client machine, switch to the SAN File System mount point, and change to the global fileset directory.

   ```
   # pwd
   /mnt/SAN_FS_MOUNTPT/sanfs
   # ls
   total 8
   d-------- 2 1000000 1000000 4096 July 3 10:21 aix51
   dr-xr-xr-x 2 1000000 1000000 4096 July 3 10:08 .flashcopy
   #|
   ```

5. Change the ownership and permissions of the fileset.

   ```
   # chown root:system aix51
   # chmod 755 aix51
   # ls
   total 8
   drwxr-xr-x 2 root    system  4096 July 3 10:21 aix51
   dr-xr-xr-x 2 1000000 1000000 4096 July 3 10:08 .flashcopy
   #|
   ```

Chapter 3. Creating a fileset for Linux

Perform the following steps to create a fileset for Red Hat Advanced Server 2.1 Linux.

1. In the My Work frame, click **Manage Filing** ⟶ **Create a Fileset**.
   - In the Create a Fileset panel:
   a. Fill in the **Name** field (Linux_Fileset), the **Description** field (for example, A fileset for Linux-only files), and select a server (for example, ST0) from the drop-down list.
   b. Under **Attach Point**, fill in the **Directory Path** field (for example, sanfs) and the **Directory Name** field (for example, linux21). Click **OK**.
   - Optionally, select a **Server Assignment Method** and **Quota Options**.
2. Click **Manage Filing** ⟶ **Filesets**. Verify your new fileset in the list.
3. Grant root privileges to the client by clicking **Manage Servers and Clients** ⟶ **Client Sessions**.
   a. In the Client Sessions panel, Select a client, select **Grant Clients Root Privileges** from the drop-down list, and then click **Go**.
4. On the Red Hat Linux client machine, switch to the SAN File System mount point, and change to the global fileset directory.

   ```
   # pwd
   /mnt/SAN_FS_MOUNTPT/sanfs
   # ls
   total 8
   d--------- 2 1000000 1000000 4096  July 3 10:21 linux
   dr-xr-xr-x 2 1000000 1000000 4096  July 3 10:08 .flashcopy
   #|
   ```

5. Change the ownership and permissions of the fileset.

   ```
   # chown root: linux
   # chmod 755 linux
   # ls
   total 8
   drwxr-xr-x 2 root     root     4096 July 3 10:21 linux
   dr-x-xr-x  2 1000000 1000000 4096 July 3 10:08 .flashcopy
   #|
   ```

Chapter 4. Creating a fileset for Solaris

Perform the following steps to create a fileset for Solaris.

1. In the My Work frame, click **Manage Filing** ⟶ **Create a Fileset**.

    • In the Create a Fileset panel:

    a. Fill in the **Name** field (Solaris_Fileset), the **Description** field (for example, A fileset for Solaris-only files), and select a server (for example, ST0) from the drop-down list.

    b. Under **Attach Point**, fill in the **Directory Path** field (for example, sanfs) and the **Directory Name** field (for example, solaris9). Click **OK**.

    • Optionally, select a **Server Assignment Method** and **Quota Options**.

2. Click **Manage Filing** ⟶ **Filesets**. Verify your new fileset in the list.

3. Grant root privileges to the client by clicking **Manage Servers and Clients** ⟶ **Client Sessions**.

    a. In the Client Sessions panel, Select a client, select **Grant Clients Root Privileges** from the drop-down list, and then click **Go**.

4. On the Solaris client machine, switch to the SAN File System mount point, and change to the global fileset directory.

```
# pwd
/mnt/SAN_FS_MOUNTPT/sanfs
# ls
total 8
d--------- 2 1000000 1000000 4096  July 3 10:21 solaris
dr-xr-xr-x 2 1000000 1000000 4096  July 3 10:08 .flashcopy
#
```

5. Change the ownership and permissions of the fileset.

```
# chown root: solaris
# chmod 755 solaris
# ls
total 8
drwxr-xr-x 2 root     root     4096 July 3 10:21 solaris
dr-x-xr-x  2 1000000 1000000 4096 July 3 10:08 .flashcopy
#
```

Chapter 5. Creating a fileset for Windows

Perform the following steps to create a fileset for Windows®.

1. In the My Work frame, click **Manage Filing** → **Create a Fileset**.
   - In the Create a Fileset panel:
   a. Fill in the **Name** field (for example, Win_Fileset), the **Description** field (for example, A fileset for Windows files), and select a server (for example, ST0) from the drop-down list.
   - Optionally, select a **Server Assignment Method** and **Quota Options**.
   a. Under **Attach Point**, fill in the **Directory Path** field (for example, sanfs) and the **Directory Name** field (for example, win2k), and then press **OK**.

2. Click **Manage Filing** → **Filesets**. Verify your new fileset in the list.

3. Grant root privileges to the client by clicking **Manage Servers and Clients** → **Client Sessions**.
   a. In the Client Sessions panel, select a client, select **Grant Clients Root Privileges** from the drop-down list, and then click **Go**.

4. Open Microsoft® Windows Explorer, expand the SAN File System drive letter, and then select the fileset you just created (for example, win2k). Set the owner by right-clicking and selecting **Properties**. Click the **Security** tab. Click **Advanced** , and then click the **Owner** tab.

5. Set permissions by selecting the folder containing the fileset (for example, win2k) and right-clicking and selecting **Properties**. Click the **Security** tab. Click **Advanced**, and then click the **Permissions** tab. Select a permission, and then click **Apply** and **OK**. Click **OK** again.

When you are done, the fileset is now ready for use on the Windows 2000 operating system.

Chapter 6. Using a fileset for file sharing

Perform the following steps to use a fileset for file sharing.

1. To share files on a fileset that is configured for UNIX®-based clients, change permissions for `other` to the directory on the UNIX-based client that represents that fileset. The `other` permissions in UNIX maps to the `Everyone` permissions in Windows. You can change `Everyone` permissions on Windows, and this is reflected on UNIX. This allows file sharing between the UNIX-based clients and Windows-based clients.

2. After setting up a fileset for file sharing, copy some files into that fileset on one client and view them on the other client to make sure that file sharing works properly.

Chapter 7. Implementing a simple policy

Perform the following steps to implement a simple policy.

1. From the SAN File System console, click **Manage Filing** ⟶ **Create a Policy** in the My Work frame. Click **Next**. In the Create a Policy pane:

   a. Under **High-Level settings**, fill in the **Name** field (for example, TxtExePolicy) and the **Description** field (for example, Move .txt and .exe to a specific pool), then click **Next**.

2. Under **Add Rules**, fill in the **Rules Description** field with a description of the rule about .txt files (for example, Move .txt files to My_New_Pool). Select a storage pool from the **Storage Pool Assignment** drop-down list (for example, My_New_Pool). Select the **File name** checkbox. Select **ends with** in the drop-down list, and then fill in the adjacent field (for example, .txt). Click **New Rule**, and repeat this step for .exe. Click **Next** when finished.

3. In the Edit Rules for Policy pane, verify the rules. Edit if necessary, and then click **Finish**.

4. Click **Manage Filing** ⟶ **Policies**. Select the policy (for example, TxtExePolicy). Click **Activate** from the drop-down list, then click **Go**. Verify the activation.

This policy is now active. Any new files created with an extension of ″txt″ or ″exe″ will be stored in My_New_Pool.

Chapter 8. Verifying file placement by policy

Perform the following steps to verify file placement by policy.

1. From the AIX client machine, create sample .txt and .exe files (for example, file1.txt and file2.exe). Because only the file name is examined, not the content, the files may contain anything.

```
# pwd
/mnt/SAN_FS_MOUNTPT/sanfs/aix51
# cat /etc/hosts >file1.txt
# cat /etc/hosts >file2.exe
# ls -l
total 9
-rw-r--r-- 1 root    system 149 July 3 13:06 file1.txt
-rw-r--r-- 1 root    system 149 July 3 13:06 file2.exe
d--------- 2 1000000 1000000  2 July 3 10:03 .flashcopy
```

2. Log in to the master metadata server and display the list of volumes from the Administrative CLI). Verify the volumes in the pool (in this example, My_New_Pool). command-line interface (ACLI). Verify the volumes in the pool (in this example, My_New_Pool).

```
mds1:-#sfscli
sfscli> lsvol
Name           State      Pool          Size(MB)  Used(MB)  (%)
=========================================================
MASTER         Activated  SYSTEM          2000      192      9
My_New_Pool-1 Activated  My_New_Pool     2000       16      0
```

3. Run reportvolfiles on that volume to see the list of files that are in that pool.

```
sfscli> reportvolfiles My_New_Pool-1
AIX_Fileset:aix51/file1.txt
AIX_Fileset:aix51/file2.exe
```

This shows that the sample files (file1.txt and file2.exe) are in the AIX_Fileset fileset and have user data in the pool My_New_Pool on the volume My_New_Pool-1.

Chapter 9. Migrating data

Perform the following steps to migrate data.

1. From the AIX client machine, select the directory containing the data to be migrated to SAN File System (for example, /etc on an AIX client).

2. Ensure that you have root privileges by running **lsclient** from the ACLI.

   ```
   sfscli> lsclient
   Client      Session ID State   Server Renewals Privilege
   ====================================================
   aixclient      1        Current ST0    83        Root
   aixclient      1        Current ST1    83        Root
   ```

3. On the AIX machine, check the space used by this set of data.

   ```
   # du -sk /etc
   8120 /etc
   ```

4. Invoke the **plan** phase of migration:

   ```
   # /usr/tank/migration/bin/migratedata -log /tmp/log.migrate
   -phase plan -destdir /mnt/SAN_FS_MOUNTPT/sanfs /etc
   PLAN: Source directory: /etc
   PLAN: Number of file objects to migrate: 1658
   PLAN: Destination directory: /mnt/SAN_FS_MOUNTPT/sanfs/
   _tmp2075226185_
   PLAN: On destination space required: 17.343750MB.
   Available: 3648MB
   PLAN: Number of CPUs: 1. Available memory: 6MB.
   IO Blocksize: 1MB
   ```

5. Invoke the **migrate** phase of migration:

   ```
   # /usr/tank/migration/bin/migratedata -log /tmp/log.migrate
   -phase migrate -destdir /mnt/SAN_FS_MOUNTPT/sanfs /etc
   PLAN: Source directory: /etc
   PLAN: Number of file objects to migrate: 1658
   PLAN: Destination directory: /mnt/SAN_FS_MOUNTPT/sanfs
   PLAN: On destination space required: 17.343750MB. Available: 3648MB
   MIGRATE: Number of CPUs:1. Available Memory:3MB. IO Blocksize:1MB.
   MIGRATE: COPY STARTED
   MIGRATE: COPY COMPLETE: 4.703488MB copied at 0.145436MB/sec
   ```

6. Invoke the **verify** phase of migration:

   ```
   # /usr/tank/migration/bin/migratedata -log /tmp/log.migrate
   -phase verify -destdir /mnt/SAN_FS_MOUNTPT/sanfs /etc
   PLAN: Source directory: /etc
   PLAN: Destination directory: /mnt/SAN_FS_MOUNTPT/sanfs
   VERIFY: Comparing files started.
   VERIFY SUCCEEDED: Comparing files completed with 0 errors and 0 resets
   # ls
   etc
   # pwd
   /mnt/SAN_FS_MOUNTPT/sanfs
   ```

17

Chapter 10. Creating a system metadata backup

Perform the following steps to create a system metadata backup.

Refer to *Maintenance and Problem Determination Guide* for more information.

1. From the SAN File System console, click **Maintain System** ⟶ **Disaster Recovery** in the My Work frame.

2. In the Disaster Recovery panel:

    a. Click **Create** from the **Recovery Files** drop-down list and click **Go**.

    b. Under **Creation method**, create a dump file by typing a file name in the **Create - create new recovery file** field (for example, My_Dump) and click **OK**.

3. From the ACLI, invoke the **lsdrfile** command to verify that the disaster-recovery file exists. Then invoke the **builddrscript** command to create the CLI scripts from the disaster-recovery file.

   ```
   sfscli> lsdrfile
   Name      Date and Time            Size (KB)
   ============================================
   My_Dump   July 23, 2003 1:01:05 AM    1
   sfscli> builddrscript My_Dump
   CMMNP2172I DR script files for "My_Dump" built.
   ```

4. Exit sfscli. From the bash prompt, switch to the recovery directory /usr/tank/server/DR and list the files in that directory.

   ```
   mds1:~ # cd /usr/tank/server/DR
   mds1:/usr/tank/server/DR # ls
   My_Dump.dump     TankSysCLI.attachpoint
   TankSysCLI.auto  TankSysCLI.volume
   ```

5. Save all four files (one disaster-recovery and three scripts) with your file data backup. To restore your system metadata, you can use the three CLI scripts to re-create your system metadata.

Chapter 11. Creating a FlashCopy image

Perform the following steps to create a FlashCopy® image.

1. From the SAN File System console, click **Maintain System** ⟶ **Create FlashCopy Images** in the My Work pane. In the Create FlashCopy Images panel, click **Next**. Under **Select Filesets**, select the filesets of which you want to make a FlashCopy image (for example, AIX_Fileset) and click **Next**. Under **Set Properties**, accept the defaults and click **Next**. Verify your settings, and then click **Finish**.

2. To list the FlashCopy images, click **Maintain System** ⟶ **FlashCopy Images**. The default FlashCopy image name (for example, Image-1) should be listed.

3. Change ownership and permissions on the fileset's .flashcopy directory to navigate it. The directory contains an entry for each FlashCopy image name.

   ```
   # pwd
   /mnt/SAN_FS_MOUNTPT/sanfs/aix51
   # ls -1
   total 9
   -rw-r--r-- 1 root system     149 July 3 13:06 file1.txt
   -rw-r--r-- 1 root system     149 July 3 13:06 file2.exe
   d--------- 3 1000000 1000000   3 July 3 14:09 .flashcopy
   # chown root:system .flashcopy
   # chmod 755 .flashcopy
   # cd .flashcopy
   # ls -1
   total 1
   drwxr-xr-x 2 root system       4 July 3 14:09 Image-1
   ```

4. Change the directory representing the image name to view the files as the FlashCopy images are created.

   ```
   # cd Image-1
   # ls -1 total 8
   -rw-r--r-- 1 root system     149 July 3 13:06 file1.txt
   -rw-r--r-- 1 root system     149 July 3 13:06 file2.exe
   ```

5. Attempting to write to the file will cause an error that states `write error: Read-only file system` to appear. Note that this applies to the .flashcopy directory only.

Appendix A. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

Features

These are the major accessibility features in SAN File System:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen.

  Note: The SAN File System Information Center and its related publications are accessibility-enabled for the IBM Home Page Reader.

- You can operate all features using the keyboard instead of the mouse.

Navigating by keyboard

You can use keys or key combinations to perform operations and initiate many menu actions that can also be done through mouse actions. You can navigate the SAN File System console and help system from the keyboard by using the following key combinations:

- To traverse to the next link, button or topic, press Tab inside a frame (page).
- To expand or collapse a tree node, press Right Arrow or Left Arrow, respectively.
- To move to the next topic node, press Down Arrow or Tab.
- To move to the previous topic node, press Up Arrow or Shift+Tab.
- To scroll all the way up or down, press Home or End, respectively.
- To go back, press Alt+Left Arrow.
- To go forward, press Alt+Right Arrow.
- To go to the next frame, press Ctrl+Tab. There are quite a number of frames in the help system.
- To move to the previous frame, press Shift+Ctrl+Tab.
- To print the current page or active frame, press Ctrl+P.

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be

incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
MW9A/050
5600 Cottle Road
San Jose, CA 95193 U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this information and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement, or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice and represent goals and objectives only.

Trademarks

The following are trademarks of International Business Machines Corporation in the United States, other countries or both:

- AIX
- FlashCopy
- IBM
- Red Hat
- TotalStorage

Red Hat, the Red Hat "Shadow Man" logo, and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc., in the United States and other countries.

Microsoft and Windows and Windows NT® are trademarks or registered trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, and service names may be trademarks or service marks of others.

Index

A
About the Quick Start v

C
creating
   fileset for AIX 3
   fileset for Linux 5
   fileset for Solaris 7
   fileset for Windows 9
   FlashCopy image 21
   storage pool 1
   system metadata backup 19

D
data, migrating 17

F
file
   placement 15
   sharing 11
fileset
   creating for AIX 3
   creating for Linux 5
   creating for Solaris 7
   creating for Windows 9
   for file sharing 11
FlashCopy image
   creating 21

I
implementing a simple policy 13

M
migrating, data 17

P
policy
   implementing 13

policy *(continued)*
   verifying file placement 15

S
storage pool
   creating 1
system metadata backup
   creating 19

V
verifying, file placement 15

IBM ®

Printed in USA