FLASH
Tivoli SANergy, Version 2.2.4,
FixPack Build 3.2.8.0

FLASH for Storage Area Network File Sharing Software
July 1, 2005

Abstract
This document outlines the specifics for using Tivoli SANergy Version 2.2.4. It contains information on product enhancements and bug fixes made since the last FixPack.

FixPack History		
FixPack	Date	FixPack Version #
Initial	September 4, 2002	3.2.0.0
1	October 11, 2002	3.2.1.0
2	October 15, 2003	3.2.2.0
3	February 12, 2004 March 1, 2004 (AIX updates now available)	3.2.3.0
4	July 2, 2004 The refreshed SANergy CD contains this version of software.	3.2.4.0
5	October 1, 2004 November 22, 2004	3.2.5.0 3.2.5.3 (Windows, Solaris, & AIX)
6	December 15, 2004	3.2.6.0
7	April 1, 2005	3.2.7.0
8	July 1, 2005	3.2.8.0

Contents

Version Number Change

This version of the Tivoli SANergy product is classified as SANergy Version 2 Release 2.4 instead of SANergy Version 3 Release 2.0 as indicated in the product and its associated publications. We apologize for any confusion this may cause.

General Information

This document outlines the specifics for using Tivoli SANergy Version 2.2.4. It contains information on product enhancements and bug fixes made since the last FixPack. Keep this information with your product manual. It is up to date as of this printing.

For additional information regarding the Tivoli SANergy 2.2.4 software, please go to *http://www-3.ibm.com/software/sysmgmt/products/support/TivoliSANergy.html* and look at the README document that can be found under the Self Help, Downloads section. The README document contains detailed information regarding product enhancements, system requirements, workarounds, and any known issues. The README was current as of September 4, 2002; all information in this Flash document are additions and/or replaces any outdated information in the README.

Updates to Flash – July 1, 2005

The updates to this Flash are:
- The FixPack build is labeled 3.2.8.0
- Platform updates, APAR and defect fixes.

New Platform Support

- none -

End-of-Life Platforms

- none -

FixPack Build Information

Windows Build #: 3.2.8.0
UNIX Build #: 3.2.8.0

SANergy Installer Filenames

Installer Executable	Platform Supported
SANergy_MSCS_3.2.8.0.exe	Windows 2000 MSCS
SANergyFS_3.2.8.0.exe	Windows XP, 2000, and 2003
sanergy_sol5.8_sparc_3.2.8.0.tar	Solaris systems - OS 5.8
sanergy_sol5.9_sparc_cd3.2.8.0.tar	Solaris systems - OS 5.9
sanergy_irix_cd3.2.8.0.tar	SGI systems - OS 6.5
san_lin2.4.9-e.3_cd3.2.8.0.tar	Linux Red Hat Adv. Server 2.1 - kernel 2.4.9-e.3
san_lin2.4.9-e.10_cd3.2.8.0.tar	Linux Red Hat Adv. Server 2.1 - kernel 2.4.9-e.10
san_lin2.4.9-e.16enterprise_cd3.2.8.0.tar	Linux Red Hat Adv. Server 2.1 - kernel 2.4.9-e.16enterprise
san_lin2.4.9-e.25summit_cd3.2.8.0.tar	Linux Red Hat Adv. Server 2.1 - kernel 2.4.9-e.25summit
san_lin2.4.9-e.37enterprise_cd3.2.8.0.tar	Linux Red Hat Adv. Server 2.1 - kernel 2.4.9-e.37enterprise
san_lin2.4.21-15.ELsmp _cd3.2.8.0.tar	Linux Red Hat Adv. Server 3.0 – kernel 2.4.21-15.ELsmp

SANergy FSF (Special-K) Software Installer Filenames & Supported Platforms

Installer Executable	Platforms Supported
sanergyfsf_lin2.4.19-64GB-SMP_cd3.2.8.0.tar	Linux Suse Enterprise Server 8 - kernel 2.4.19-64GB
sanergyfsf_aix5.2_cd_3.2.8.0.tar	AIX systems - OS 5.1, 5.2and 5.3
sanergyfsf_hpux_B.11.11_cd3.2.8.0.tar	HP UX systems – OS 11i (64-bit only)
sanergyfsf_sol5.8_sparc_3.2.8.0.tar	Solaris systems - OS 5.8
sanergyfsf_sol5.9_sparc_cd3.2.8.0.tar	Solaris systems - OS 5.9
sanergyfsf_sol5.10_sparc_cd3.2.8.0.tar	Solaris systems - OS 5.10

General Updates

Compatibilty   When Tivoli SANergy is installed on a SAN, the SANergy code must be at the same current release level for each specific operating system. Please be sure to upgrade all systems that have the same OS with the same version of SANergy.

MSCS and Windows 2003   There has presently been no testing with regard to MSCS and the Windows 2003 operating system. However, it should function similar to Windows 2000.

Windows Updates

FixPack Installation
Installation   This FixPack only applies to systems that are running Tivoli SANergy version of 3.2 or higher.

Upgrade information   If you made changes to the Options panel, write them down as these settings are overwritten when upgrading your system to SANergy version 3.2. If you previously installed and started the SNMP service, you must disable the service before upgrading your system.

Read Only File Detected message   If you receive a ReadOnly File Detected message during install, select "Don't display this message again" and press Yes. This message will only display if you previously installed the Tivoli SANergy Administrator's Guide.

APAR Fixes
APARS closed in Build 3.2.8.0 – FixPack 8
   None.

APARS closed in Build 3.2.7.0 – FixPack 7
   None.

APARS closed in Build 3.2.6.0 – FixPack 6
   IC43779– Fixed the SANergy race condition with simultaneous open caused file limit to be reached.
   IC43780 – Fixed the multi-thread write defect allowing SANergy to now read the file back correctly.
   IC43781 – Fixed the uninitialized memory read errors in sanergyd.

APARS FIXED IN THIS PTF (Build 3.2.5.3 – FixPack 5)
   IC43148 - Fixed the truncation of a read-only file when SANergy closes it.

APARS closed in Build 3.2.4.0 – FixPack 4
   None.

APARS closed in Build 3.2.3.0 – FixPack 3
   IC36783 - STOP 0x7F while using SANergy/NAV on network drive.
   IC37049- SANergy does not give sufficient errors when disk runs out of space.
   IC37983 – SANergy bluescreen failed allocation of paged pool.
   IC38077- Windows 2000 system blue screen while booting.
   IC38149- SANergy MSCS errors if regional options are set to something other than English (United States).
      Workaround: Install using English (United States), after install and setup is complete, change the locale
      back to its original setting.

APARS closed in Build 3.2.2.0 – FixPack 2
   IC35523 - SANergy MDC QFS hang.

APAR's closed in Build 3.2.1.0 – FixPack 1
   IC34766 – SANergy MSCS does not install from CD.
   This has been fixed in the new SANergy MSCS FixPack, version 3.2.1.1. which is available from the IBM Tivoli
   SANergy website.

BUG Fixes
Bug Fixes – FixPack 8 (3.2.8.0)
822 - Update the lease start time when appending a map.

Bug Fixes – FixPack 7 (3.2.7.0)
-none-

Bug Fixes – FixPack 6 (3.2.6.0)
 -none-

Bug Fixes – FixPack 5 (3.2.5.3)
You must set the dirty file Boolean to true prior to closing with DirtyFileSize.

Bug Fixes – FixPack 4
SANergy has been improved to work better with virtual IP software.

Bug Fixes – FixPack 3
Fixed the Cluster Share Resource Offline (disk access deadlock) problem.
Fixed the Incorrect filesize problem. The incorrect filesize may be returned to the application from query file information, info class FileAllInformation

Bug Fixes - FixPack 2
When a user opened NT's Performance Monitor and selected Physical Disk and Disk Bytes/sec, the performance results would be twice as large as those reported in the SANergy Setup Tool Performance Tester Tab. This double count has to do with an error in NT's reporting, the data is not going to the drive twice. Even though the problem primarily has to do with NT and not SANergy, the code has been modified so that the results in Performance Monitor and SANergy now share the same accuracy. Change the following registry key:
   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\mcfsrdr\Parameters\SubstPartDevices to 1
   and reboot.

Known Issues
Windows Hyper-Extension problem with MS Word and Excel files   Document properties displays the file size as 100MB for a short length of time, then updates the properties to the correct size. File is OK.

Releasing Ownership   SANergy may stop responding when releasing multiple volumes simultaneously.

Compressed Files   SANergy does not fuse files compressed by the operating system. All compressed files will be defaulted to go over the LAN.

Avid-NT Systems   SANergy does not work with Avid-NT systems due to Avid's inability to work with network mapped volumes.

Windows 2000 mount point issues   Windows 2000 hosts do not assume that all directories under a given share are always on the same drive as in Windows NT 4.0. Windows 2000 mount points can cause major corruption. If a Windows 2000 directory is shared out and there is another mount point inside of it, then a host can get a map for any of the files under that mount point. However, it will use that map as if it is on the same drive the share is on. This will cause SANergy to access the wrong drive.

Windows 2000 HSM Feature   SANergy does not work with the HSM feature of Windows 2000.

Volume Sets (Windows)   You may use Windows volume set capability only if you are using all Windows computers on the SAN. Macintosh and UNIX hosts do not correctly deal with volume set volumes.

Parity   SANergy does not support RAID 5, which is parity based software striping. SANergy does support RAID 0.

Mirroring   SANergy does not support RAID 1, which is software mirroring. SANergy does support RAID 0.

Sparse Files   SANergy does not support sparse files in a Windows 2000 environment.

Delete Volume Attempt (Intermittent)   SANergy only allows you to delete a volume if you are the Device Owner, although Disk Administrator may remove the drive letter and its share name if you try to delete the volume when you are not the owner.

Dynamic Volumes (Windows 2000 Striping) Windows 2000 and Dynamic Disks have certain operational issues that are not clearly understood despite our best attempts at working directly with Microsoft.

In general, you can use Dynamic Disks with SANergy successfully. However, there are situations you can get into that will make it exceedingly difficult (or impossible) to get your disk volumes back on-line. Currently, to avoid this possibility entirely, we recommend using only Basic disk partitioning.

If you use the "Import" function more than once, or re-configure a volume, there is a greater risk of encountering problems. We are in the process of understanding why these problems arise and plan on addressing them in a subsequent release.

Administrator's Guide Updates – MSCS updates
The information in this document detail changes to Appendix B, MSCS Configuration in the Administrator's Guide.

Setup, Installing, and Configuring SANergy with MSCS
The following steps outline how to setup, install, and configure MSCS and SANergy. For more detailed steps, refer to Appendix B in the SANergy Administrator's Guide and the SANergy Redbook.

MSCS Initial Setup
1. Verify that all attached storage hardware is MSCS approved by Microsoft.

2. Uninstall MSCS if it is already running. This is necessary as a previous MSCS installation has ownership of the disks you wish to be shared via SANergy, this will prevent SANergy from accessing them. An alternative to performing a complete uninstall is to delete the physical disk resources that correspond to the volumes you want to share via SANergy. These will later be redefined as SANergy Volume resources.

3. Prior to setting up a Microsoft cluster, all shared SCSI or Fiber Channel storage must be installed and configured on each node of the cluster, one machine at a time, while the other is powered off.
    - Only BASIC disks are supported and must be formatted with NTFS.
    - Disk drive partition letters must match between each node of a cluster.
    - The Quorum disk resource must be between 20–100 megabytes in size and an entire physical disk or logical volume if using a hardware raid controller, not just a partition. This is a SANergy restriction.

4. Prior to starting the MSCS installation, format and label the Quorum volume and all shared SAN volumes as you will select the Quorum volume during the Cluster Service installation. You will later need the volume serial numbers to create the new MSCS Resource called a SANergy Volume.

Install MSCS
1. Install the cluster service from Control Panel by selecting Add/Remove Programs or Add/Remove Windows Components if running Windows 2000 Advanced Server.

    The first cluster node wizard prompts you to select which disks are to be managed by the cluster.

2. Select all disk volumes EXCEPT for the QUORUM volume and move them from the managed column (right) to the unmanaged column (left).

    WARNING: Be sure that the QUORUM volume remains in the MANAGED column as it's the only volume that is controlled by the Cluster Service. The remaining disks are managed by SANergy and SANergy MSCS as SANergy volumes.

Install SANergy

<u>New Install</u>. Install SANergy on each node in the cluster as documented in Chapter 3 of the SANergy Administrator's Guide. Use special names for assigning volumes to their MDCs. When defining the MSCS quorum disk, use the special name **?FREE** for the MDC. When defining the volumes to be shared via SANergy, use the special name **?CLUS** to denote they are not owned by any specific machine, but rather the cluster.

<u>Previously installed</u>. If SANergy is presently installed when setting up the first cluster node, make sure this node owns all SAN volumes and the Quorum volume. Use the Volume Ownership tab to do this. This allows the MDC or node full access to the volume labels and serial numbers which are needed during cluster setup and when creating SANergy volumes. Use the command line to get all needed serial numbers, Example: (X:\dir). Once you have all the volume serial numbers, write them down or save them in a text file.

> **NOTE**: Be sure to REMOVE the hyphen when entering a volume serial number (serial numbers are not case sensitive). Once you have the volume serial numbers and the cluster service has started successfully on the first node, you may now install SANergy MSCS. The first cluster node installation only installs the drivers and exits.

Before starting installation on the second Cluster node, assign the Quorum and any SANergy MSCS volumes with special names for failover to work properly with SANergy. The Quorum volume ownership tab must be assigned ?FREE and all SANergy MSCS volumes must be assigned with ?CLUS. After completion, the Active Cluster Node has direct access to the Quorum and the soon to be created SANergy MSCS resource Volumes.

> **NOTE**: Any other SAN volumes (not Clustered) simply remain assigned with the appropriate MDC name. These will function as normal SANergy volumes.

Bring the second Cluster node online. Install the MS Cluster Service and choose "second node"; The MS Cluster wizard prompts you to enter the NAME of the existing Cluster that is already online. If necessary you can try the name of the other node. Once the cluster is joined and both are online, you must install SANergy MSCS.

INSTALL SANERGY-MSCS SOFTWARE

The installer asks which system in the cluster you are currently installing. Ensure that you properly answer that question, because a different set of files gets installed for the last system installed in a cluster. The cluster server **must** be running prior to this step.

> **Note:** Be sure to specify the same installation location on ALL machines in the cluster. That is, if you choose to install them on **C:\program files\SANergy\SANergyMSCS** on one machine, you must install to that location on the remaining systems. This is a restriction of MSCS.

1. Install the SANergy-MSCS layer on each system.

    Note: Before installing on the last cluster node, bring up **Cluster Administrator** or the install may fail after login.

2. Install on the final cluster node. When installing on the final cluster node, select **Final Cluster Node Setup**.

    Note: The **Final Cluster Node** system displays an additional installation window after the reboot and login window.

3. Click **Install** to complete the installation.

4. Click **Exit**.

5. Click **Finish** to restart the system.

Now the SANergy MSCS Resource is registered into the Cluster. When complete you should be able to run the Cluster Administrator and create the new SANergy Volume resource.

> **Note**: You will now need your 8 character Volume Serial numbers, remember to drop the hyphen and also note they are NOT case sensitive.

Create SANergy Disk Resources

You told SANergy which disks to ignore, and let another program manage them; now you need to tell MSCS which disks SANergy will manage. It is possible that some of the disks that you want SANergy to manage are configured to be managed by MSCS. If so, delete those disk resources. Then, create new disk resources and select the **SANergy Volume Resource** as the manager.

Disks that you configure in this manner are special. The MDC for that disk will be whatever cluster member is currently in control of the disk (provided the **?CLUS** SANergy owner tag is in place). If a cluster failover take place, this disk will be automatically mounted on the new member and will automatically become the SANergy MDC. That is, when the volume is brought online by cluster server (or interactively), then the volume will be mounted and available to that node (as a SANergy MDC volume).

All disk resources and share resources must be created under the **Cluster Group** in order for SANergy to work. When creating the SANergy volume resources, you must enter the serial number of the volume.

Note: Be sure to remove the hyphen from the serial number before entering.

1. Select **Start->Programs->Administrative Tools->Cluster Administrator**. The **Cluster Administrator** window appears.

2. From the **Groups** folder, open **Cluster Group**.

3. Right-mouse click on **Cluster Group** and select **New/Resource**. The New Resource window appears.

4. From the **Name** field, type the SANergy volume name.

5. (Optional) Type in a volume description.

6. From the **Resource Type** field, click on the down arrow key and select the SANergy volume.

7. From the **Group** field, select **Cluster Group**.

8. Click **Next**. The **Possible Owners** window appears. Be sure all SANergy systems are in the possible owners field.

9. Click **Next**. The **Dependencies** window appears. Ignore this as there are no dependencies for SANergy volumes.

10. Click **Next**. The **SANergy Volume Parameters** window appears.

11. From the **Volume Label** field, type the volume name.

12. From the **Serial Number** field, type the volume serial number (excluding the hyphen).

13. Click **Finish**. The new volume appears in the **Cluster Administrator** window. The default value is **offline**.

14. Right-mouse click on **Cluster Group** and select **Bring on-line**.

15. Set up Sharing for this volume by creating CIFS disk shares or NFS exports.

    Note: The disk share or NFS exports must be created within the Cluster Administrator as a cluster resource, not just from "my computer" for normal non-clustered disk shares. Also the disk share must be created for SANergy volumes before the SAN can fail over and fail back properly.

16. Repeat the above procedure for all remaining SANergy volumes.

You may test the Cluster fail over by right-clicking on the Cluster Group and selecting "Move Group". All Cluster Resources should promptly move from node to node.

Solving Common Problems Setting up SANergy in MSCS and Zoned Environments

To prevent Microsoft Windows from allowing multiple machines to mount the same NTFS volume, SANergy by default will mark any unmarked volumes with the name of the machine that first mounts them.

This behavior is automatic.

Once a volume is marked with an owner, any machine that SANergy is installed on will not be allowed to mount the volume unless it is the owner of the volume.

Because of this, there are situations that you can get into when setting up SANergy in a complex clustered or zoned environment that will not make it easy for you to assign SANergy volume ownership in the proper way.

Below details some common problems and points out which methods will help you resolve them. Find the problem that matches your situation and follow the instructions.

Problems:

Problem 1: Cannot start Microsoft Cluster Service on any of the cluster nodes when SANergy is installed.

One cause of this could be that SANergy has marked the volume that is on the cluster's quorum disk with the name of a machine that is not part of the cluster. To determine which machine that SANergy thinks currently owns a volume can be difficult because on the cluster machines, clusdisk.sys may be preventing the SANergy Setup Tool from accessing the volume. Likewise, SANergy may be preventing the Microsoft Cluster Server from properly seeing the volume.

(Non-cluster nodes, if there are any)   In this case, only the machines that are not cluster nodes may be able use the SANergy Setup Tool to assign ownership to any of the volumes. If you have this type of machine on your SAN, then you should be able to run the SANergy Setup Tool and assign the appropriate owner to the volume. If you cannot find a machine that can determine the volumes current owner, then it may be that the machine was renamed or that the SAN was re-zoned without removing SANergy ownership of the volume. It this is the case, follow the instructions in the "Disabling the SANergy driver responsible for protecting disks" in the Techniques section on one of the cluster nodes.

When you reboot, you should be able to bring the cluster node online and run the SANergy Setup Tool to see the current volume owner. You can then relinquish ownership by making the name of the volume owner blank, that is, change the volume owner and do not specify any name in the owner field.

Once the SANergy volume ownership is relinquished, you are free to make it whatever it should be for your cluster:

When you are done, make sure you follow the instructions in "Re-enabling the SANergy driver responsible for protecting disks" in the Techniques section, otherwise the node will not function as a SANergy client or MDC.

Problem 2: One of the Microsoft Cluster server nodes can be started, but the others cannot.

You can get into this situation by neglecting to change the ownership of the quorum resource to ?FREE. To fix this, go to the cluster node that can be started and run the SANergy Setup Tool. Then, assign the owner of the volume that is on the quorum disk to a value of ?FREE. You should now be able to start the cluster on all the cluster nodes.

Problem 3: The cluster starts up and the quorum disk comes online, but other Physical Disk resources do not come online on any of the cluster nodes while SANergy is installed.

This typically means that the volume on the Physical Disk resource is owned by a machine other than those that are members of the cluster. In order for SANergy to allow the cluster access to these volumes, the volumes that are managed by the Microsoft Physical Disk resource must be marked with the owner ?FREE. To do this, follow the instructions in the "Disabling the SANergy driver responsible for protecting disks" section.

When you reboot, you should be able to run the SANergy Setup Tool and see the current volume owner. You can now relinquish ownership by changing the name of the volume owner to blank, that is, change the volume owner and do not specify any name in the owner field.

Once SANergy volume ownership is relinquished, you are free to set its value to ?FREE.

When you are done, make sure you follow the instructions in "Re-enabling the SANergy driver responsible for protecting disks" otherwise the node will not function as a SANergy client or MDC.

Problem 4: You get the message "FTX375W and you are not allowed to remove xxxxxxx as an owner while that system is active."

The most desirable option for fixing this problem is to run the SANergy Setup Tool from machine xxxxxxx and remove the volume ownership from there. But this may not be possible because the machine xxxxxxx may no longer have access to these disks due to zoning or the operations of Microsoft Cluster server.

If you are certain that the machine mentioned in the message (xxxxxxx in this example) no longer has the volume mentioned, then you have a couple of options for getting around this:

1. You can shutdown the machine (xxxxxxx) and try to remove the owner again. If you are unable to shutdown the machine, then you can use the next option.

2. You can follow the instructions in "Fooling SANergy Setup Tool into thinking that the current machine is the current owner of the disk".

Problem 5:   All the volumes on disks managed by Microsoft's Physical Disk resource are set to ?FREE, but you still cannot bring the cluster online

When a disk is marked ?FREE, SANergy will protect it only if it detects a free device manager. The free device manager is detected by attempting to open the device mentioned in the following registry key:

   \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\mcfs\Parameters\FreeDeviceManager.

The default for the key is \Device\ClusDisk0

Historically MSCS has used this device name, but if SANergy can no longer open it reliably or the name is changed, then it will prevent access to disk marked ?FREE.

SANergy assumes the role of protecting the disks marked ?FREE from access if it cannot detect that the device \Device\ClusDisk0 is present.

If you want to make sure that SANergy never prevents access to disk marked ?FREE, then make this value an empty string.

Techniques:
1. Disabling the SANergy driver responsible for protecting disks.
        cd %WINDIR%\system32\drivers
        move mcfs.sys mcfs.sys.backup
        Reboot...

2. Re-enabling the SANergy driver responsible for protecting disks.
        Start a command prompt (Start -> Programs -> Accessories -> Command Prompt)
        cd %WINDIR%\system32\drivers
        move mcfs.sys.backup mcfs.sys
        Reboot...

3. Fooling SANergy Setup Tool into thinking that the current machine is the current owner of the disk.
   Do this only when you know for certain that the machine that's used to own the disk no longer has the disks mounted.
        Start a command prompt (Start -> Programs -> Accessories -> Command Prompt)
        cd "C:\program files\sanergy\sanergyfs"
        set _CLUSTER_NETWORK_NAME_=currentowner
   (to verify that this setting is working, execute the **hostname** command and the currentowner will be printed on the console).
        sanergyconfig

Now when the SANergy Setup Tool calls GetComputerName, windows will return the value that _CLUSTER_NETWORK_NAME_ is set to. This means that SANergy Setup Tool will allow you to remove ownership of the volume by setting its name to blank. (i.e. entering no text in the space where the owner will be entered). Normally, it would not allow this unless you are the current owner of the volume.
After relinquishing ownership you can then set the ownership to be the name of the current machine; ?CLUS ; or ?FREE depending on how you need your cluster set up.

For additional information and instructions on using the SANergy Setup Tool, refer to the SANergy Adminsitrator's Guide.

Unix Updates

FixPack Installation
To install this FixPack on Unix systems, be sure that your system presently has a Tivoli SANergy version of 2.2 or higher.   Do the following:
  1. Close all fused windows.
  2. Open a new terminal window.
  3. Install the FixPack software.

Solaris Shared Memory update prior to SANergy Installation
Before installing SANergy, ensure that your maximum shared memory is set to a minimum of 12 MB. To change it, do the following:
  1. Open the file **/etc/system**.
  2. Add and save this line: set shmsys:shminfo_shmmax=0xA00000
  3. Restart the computer: reboot

SLES 8 (SP 3)
SANergy presently does <u>not</u> support the SUSE Linux Enterprise Server (SLES) 8 / United Linux 1.0 - Service Pack 3 (kernel 2.4.21-138-smp #1 SMP).

Solaris Clients
Solaris 9 and 10 clients can only fuse to a Solaris MDC.

Solaris 10
SANergy presently does <u>not</u> support the UFS MDC on Solaris 10.

General Updates
Linux and Mozilla version 1.6 SANergy now supports Mozilla to display the GUI. To manually update the config script, do the following:
  1. Open the sanergy config script.
  2. Add the lines below before the 'else' statement.
     then
  /opt/NSCPcom/netscape "/tmp/SANergyConfig.html&panel=checkLicense" &
 elif [-f /usr/local/mozilla/mozilla]
    then
     /usr/local/mozilla/mozilla "/tmp/SANergyConfig.html&panel=checkLicense" &

Mounting NFS Volumes
SANergy must be aware of the association of a network mount point and the equivalent hard mount point of the storage elements. Refer to your NFS documentation for the specifics on how to mount and verify network volumes successfully. Test the volume mounts for correct user access. If the NFS volumes do not mount properly, see your NFS documentation or product manufacturer.

Use one of the following options for NFS mounting:

<u>AIX 5.1</u>
   Mount -o acregmin=0,acregmax=0,actimeo=0,noac host:/share_name/mount_point /local_mount_point

<u>AIX 5.2, HP_UX, Solaris, SGI</u>
   Mount -o noac host:/share_name/mount_point /local_mount_point

<u>Linux</u>
   Mount -o acregmin=0,acregmax=0,actimeo=0 host:/share_name/mount_point /local_mount_p

Notes:
  • Some versions of NFS require different mounting options. If the above mount commands do not work, please refer to your operating system, NFS, and networking documentation to correctly mount the NFS volume.
  • In Services for UNIX 2, if the share name is one letter, you need the slash (/) in the path. If more than one letter, do not use the / after *host:*
  • The share name and volume share names must be the same.

APAR Fixes
APARS FIXED IN THIS PTF (Build 3.2.8.0 – FixPack 8)
   IC45943   (Special K) SANergy panics when using named pipes on an NFS mount.
   IC46200   (Special K) SANergy can hang when importing SANergyconfig.txt at startup.
   IC46442   (SANergy) SANergy Linux mdc incorrectly sets the allocation size of file larger then 4GB.

APARS FIXED IN THIS PTF (Build 3.2.7.0 – FixPack 7)
   IC45565 (SANergy) - When running SANergy 3.2.5.4 and QFS 4.2.2, bouncing the MDC sanergyd causes write() to fail with
         EIO. Subsequent write attempts to the open file descriptor will now fail, rather than sent via NFS.
   IC44063 (Special K, AIX) – Fixed the SANergy MDC so that it writes to the correct area on the disk when AIX moves a file.
   IC45305 (Special K) - You can now remove a file from a sanergy nfs mounted filesystem.
   IC44690 (Special K) - The SANergy debug messages no longer fill the /var/adm/messages file.
   IC44866 (Special K) – Fixed the unfuse filesystem data overrun.
   IC44482 (Special K) – Fixed the attempt to fuse multiple mount points fails.
   IC45033 (SANergy) – Fixed the simultaneous OPEN() causes failures.

APARS FIXED IN THIS PTF (Build 3.2.6.0 – FixPack 6)
   IC43579 (Special K, AIX) - Fixed the owner command core dump during installation.
   IC43779 (SANergy) – Fixed the SANergy race condition with simultaneous open caused file limit to be reached.
   IC43780 (SANergy) – Fixed the multi-thread write defect allowing SANergy to now read the file back correctly.
   IC43781 (SANergy) – Fixed the uninitialized memory read errors in sanergyd.
   IC43346 (SANergy) – Fixed the shell script hang with SANergy preload set.
   IC43427 (SANergy) – Fixed the file size defect when writing a file.

APARS FIXED IN THIS PTF (Build 3.2.5.3 – FixPack 5)
   IC43346 - Fixed the SANergy preload set so that the shell script doesn't hang on the SAN.
   IC43427 – Fixed the file size result when SANergy is fused for writing.

APARS closed in Build 3.2.4.0 – FixPack 4
   IC41199 - Fuse of volumes takes a long time. (AIX, Special-K software)
   IC41186 - Unpredictable results when Fortran compiled to a SANergy managed disk. (AIX, Special-K software)
   IC41205 - Cannot fuse with non-root users due to compress and gzip problems . (SGI, SANergy software)

APARS closed in Build 3.2.3.0 – FixPack 3
   IC39008 - Exclude function causes SANergy to fail (Special-K software).
   IC39026 - Using the unfuse command may result in a system call error (Special-K software).
   IC38141 - Accessing a null pointer may cause core dump.
   IC38857 - Added an NFS Mounting option (Mount –noac) to the SANergy Special K Instructions.

APARS closed in Build 3.2.2.0 – FixPack 2
   IC35811 - Read behind write function causes performance degradation in a SANergy environment with QFS.
   IC35854 - FOPEN failures may occur when opening files on a fused volume.
   IC35855 - LSTAT call may hang when accessing fused volume.
   IC36039 - In SANergy environment FPRINTF interprets "%" as format conversion specifiers.
   IC37253 - SANergy device owner list display
   IC35231 - SANergy PMserver set libpath libc.a
   IC35706 - SGI applications that call fscanf may result in a core dump.
   IC36244 - onfail option added to SANergy.

APAR's closed in Build 3.2.1.0 – FixPack 1
   None.

BUG Fixes

Bug Fixes – Build 3.2.8.0

Special K FSF

814 "unfuse" on AIX does not de-reference the raw devices.
815 Minor configuration changes.
816 Solaris 10 NFS 4 support added.
817 More Solaris 10 updates. VFS hook.
818 Solaris FSF panics when using named pipes.
820 SANergy AIX fsf hangs when failing over to LAN.
823 Cleanup -1 errors being returned to applications from kernel mode.
825 Hyper not displaying properly in vstats.
826 AIX not handling hard linked file properly on close.
828 AIX log time does not match local time.
827 In setsize messages for lease updates the write lease value is always used.
829 Linux mdc does not report the correct allocation size for files.
830 AIX log permissions set so "Other" can write but not read.
831 Set Sun log level in sanergyfs when global logging is set.
834 Solaris device names truncated during initialization when using Qlogic HBA's.

SANergy

811 Added a maxUnalignedXfer parameter to sanergy to handle large io cases that end up with very large canonical maps. This relates to error -7 being returned from blockio.
821 Added support for handling "//" and "//...." in the full name builder.
824 sanergyd needs to start after the import of sanergyconfig.txt in the init startup scripts.

Bug Fixes – Build 3.2.7.0

Special K FSF

(AIX) Fixed the SANergy MDC crash when the volume description is too large.
(AIX) Fixed the extra prints in AIX.
(AIX) You can now fuse multiple NFS mount points simultaneously.
(AIX) Fortran Open - Write - Close sequence results in file corruption. Turns out a truncate is being called by the exe before the first write. Fixed truncate to not allow fused files to go over NFS.
Fixed the clean-up when running perf.
Fixed the print version to the log at the startup of the daemon.
(MDC All platforms) Removed extra logging statements.

SANergy

Fixed lease default time during setsize call inside of the write call.
Fixed onfail error condition that could cause IO to LAN during error setting.
libSANergy is now compiled position-independent.
Fixed sanlog panic kill to just kill the process that it is in.
Fixed the race condition on attaching to shared memory segment.

Bug Fixes – Build 3.2.6.0

Special K – (AIX) Fixed the install so that SANergy doesn't chmod everything 777 including /usr.
Special K – (AIX) Fixed the client I/O call, it now returns the correct number of bytes.
SANergy – Fixed the clean-up of remaining reference to non-mt calls.

Bug Fixes – Build 3.2.5.3

<u>Special K FSF</u>

(AIX) Fixed "fuse -> unfuse -> sanergy stop" issue.

Added Lun blocking for all devices listed in a specified text file. Controlled by the SANergyconfig "blockluns" command.

Added Lun blocking to FSF for hp-ux, solaris, and aix. If devices.txt is present and "SANergyconfig blockluns on"
       is set, then all luns listed in devices.txt will be blocked.

The Solaris Makefile now updates to use a common sol_sanmem.c

Fixed compiling errors for Solaris platforms.

AIX SANergy fsf crashes if:
       1. fuse a nfs volume (hook)
       2. Unfuse
       3. /etc/rc.sanergy stop

Fixed the AIX client i/o call so that it returns correct number of bytes.

Fixed the AIX install so that it doesn't chmod everything 777 including /usr.

<u>SANergy</u>

Fixed the memory errors/SEGVs in SANergy.

Bug Fixes – FixPack 5

Reports of Segv Faults in DGRAM. User mode SANergy was not using the proper reentrant gethostbyname.

Changed to use getipnodebyname.

Bug Fixes – FixPack 4

The MAX_STRIPES size is now increased from 96 to 512. This allows SANergy to handle up to 512 LUNs in the volume definition. Side effect is a rise in the amount of shared memory needed by SANergy. Shared memory max for systems must be set to at least 12MB.

Allow fbuf to change on the fly per file. The memory manager that SANergy uses is now configurable.
       "sanmem|off" uses the systems malloc.
       "sanmem|on" uses SANergy's memory manager (default).

Added configuration for how the raw device file descriptors are tracked.
       "rawopenid|on" SANergy opens the raw devices for every thread in a process.
       "rawopenid|off" SANergy only opens the raw devices once per process (default).

Configuration for deferred open of raw devices.
       "deferfd|on" SANergy opens the raw device during the first IO to a file. (default)
       "deferfd|off" SANergy opens the raw device during the open of a file.

Under stress, the mdc may fail to send a map during a "getRealMap" call during a write operation which causes a
   core dump. SANergy now includes proper error checking for this condition.

Corrected handling of multiple retries when ONFAIL is set to ERR. Originally SANergy would unfuse the file,
   which resulted in no more IO for that file. SANergy now respects the retries from the app and returns the errno
   from the IO that SANergy is attempting. Added a "-l" parameter to sanergyd. The value is passed directly to the
   backlog parameter of the listen command in the fd server. (default is 512) (see man -s 3XNET listen on Solaris).
   This takes care of ECONNREFUSED on the client side during multiple opens.

Reports of SIGHUP killing sanergyd on Solaris systems. Added nohup to init startup of sanergyd.

Fixed problems with compress and gzip.

Bug Fixes – FixPack 3

Special K - Fixed a cache problem on Linux.

Special K - Increased MAXSTRIPES on AIX.

Bug Fixes – FixPack 2

Removed the threadcreate in fifoserver.c. This is now single threaded.

Added delayed retries for volume cookie mismatch errors in getInitalMap call. When an MDC / NFS server fails over, it can take a number of seconds for the new machine to fail over.

Fixed use of env var SANFOLLOW for creating files.

sanergyd now opens and creates the log file for users. The log file will always be set at 0600.

Fixed sun ssd driver issues in sanergyd. The raw device name could be truncated by sanergyd when a non-root user attempts to open it.

The permissions on SANergy files now match the request.

Added command "SECURELOG" to SANergyconfig.

> SECURELOG|ON or SECURELOG|OFF (default)
>
> ON - The log in the SANergy directory will always have permissions 0600
>
> OFF - permissions 0644

If ONFAIL|ERR set Open will return an EIO (errno 5) on getInitialMap failures to the application. Prior to this it would always failover to nfs.

Enhanced the duplicate message handler on the mdc side to handle heavy loads.

Added env var MAX_TRACKED_MESSAGES to allow the duplicate message cache to be increased. The default value is 100. The size of each message could be 64K. To manipulate the value, set the env var and restart sanergyd.

Added a signal handler to sanergyd for sigpipe, which fixed sanergyd die issues.

Fixed POSIX compliance issues with write, pread and pwrite.

Fixed a problem in the SANergy mmap that was found when using the file command on large files.

AIX - added llseek to the SANergy lib.

Added the command, "MAXRAWIO" to SANergyconfig.

SGI has a default value of 4MB for a raw IO request and for SUN it is 32MB.

SGI - Two parameters that set the raw IO max size include; systune maxdmasz and sysconf PAGESIZE

> max raw IO = (maxdmasz -1)*PAGESIZE

One page is reserved for the kernel.

Added env var for the socket name used in SANergy's client / sanergyd communication. To change the name set SANERGYFIFO to the complete path that you want: "/tmp/sanergy.fifo") and restart sanergyd. All the clients will also need to run with the env var set, so that non-root access to the raw devices will be available.

Known Issues

Linux Device Ownership panel You cannot assign owners to devices using the GUI device ownership panel, you must use the SANergy command Line tool.   To assign device owners from the command line, type:

> owner|device|systemname|

To remove a device owner, put a - in the systemname or tag field.

Linux install/uninstall problem (intermittent)   Intermittently, the system may freeze during the install or uninstall process.

Drag and Drop Copy   The drag-and-drop file copy command using a GUI File Manager may not be accelerated on some platforms.

sh (Bourne Shell)   You can now define the environment variable SANPWD to be 1. This allows SANergy to use the system call getcwd() to determine the working directory. Some old applications (such as diff) intermittently may have difficulty if getcwd() is called by file system routines.

National Language Version Operating Systems
AIX 5.1 / Japanese OS / Netscape Character Settings Netscape does not display the SANergy graphical user interface properly. In order to start the SANergy graphical setup tool in Japanese environment (this will launch Netscape), you must specify the following Language Environment:

AIX 5.1 Locale (Ja_JP)
MOZILLA_NLSHELPPATH=/usr/lpp/X11/lib/X11/Ja_JP/communicator
MOZILLA_NLSPATH=/usr/lpp/X11/lib/X11/Ja_JP/communicator
XENVIRONMENT=/usr/lpp/X11/lib/X11/Ja_JP/communicator/Netscape

AIX 5.1 Locale (ja_JP)
MOZILLA_NLSHELPPATH=/usr/lpp/X11/lib/X11/ja_JP/communicator
MOZILLA_NLSPATH=/usr/lpp/X11/lib/X11/ja_JP/communicator
XENVIRONMENT=/usr/lpp/X11/lib/X11/ja_JP/communicator/Netscape

If you continue to have problems with the display of SANergy, we recommend that you use the SANergyconfig program. This program is the command-command line interface that lets you control SANergy.

Tivoli Sanergy, Special-K Software (AIX, SuSE, Solaris, and HP-UX Systems)

Overview of the SANergy Special-K Software
Special-K is SANergy's new architecture on some UNIX systems. The overall product concept and the wire protocol are identical letting you mix new and/or old versions of SANergy on the same SAN.

The Special-K software has moved most of the SANergy logic into a kernel driver. From a user perspective, this indicates:
- No more LD_PRELOAD (or LIBPATH on AIX)
- No more application sensitivity to the SANergy implementation of libc
- Higher transparency to applications
- Redirection and shell applications work well.

Using The SANergy Special-K Software

UNIX Installation and Configuration

Note: Refer to the SANergy Administrator's Guide and README file located on your SANergy CD for detailed instructions on how to configure your systems before you install.

You might have to configure several computers to share storage in your SAN. Configure one computer at a time and build up the workgroup.

Most UNIX systems can be host computers in a SANergy network. AIX, Solaris, and Linux systems can be MDCs as well as hosts. All UNIX computers must have a direct SAN connection (for example, Fibre Channel) and they might need Windows-to-UNIX LAN networking technology, such as network file system (NFS). If you are using a Windows system on your SAN, use NFS.

To configure UNIX systems to work with SANergy, perform the following steps:
1. Set up and configure the MDC computers (Windows, Solaris, AIX, or Linux). See Windows MDC Setup procedure or UNIX MDC Setup procedure located in the SANergy Administrator's Guide.
2. Install and configure your UNIX-to-Windows LAN software and hardware, or both, if necessary.
3. Install your SAN hardware and drivers on the UNIX system.
4. Set up partition and volume configuration. The MDC must be able to see the actual disk systems. Remember the following points:
    - Set up the proper volume type for the MDC OS you are going to use.
    - Create your volumes after the 2nd Disk Block (Linux only).
5. Mount the NFS volumes. Ensure that the NFS volumes mount properly and without errors. Test the mounts for user access. If the NFS volumes do not mount properly, see your NFS documentation or your product manufacturer.
6. Install and configure SANergy on the UNIX system.

Device Ownership
Device ownership is **only** required if you are using Windows systems on your SAN. This is due to Windows performs automatic disk operations that can be destructive to non-Windows systems. MDC ownership is not necessary for Unix systems, this is due to SANergy does not force the volume to only be mounted by the registered MDC.

Note: The owner of a device is the only computer that should change the configuration of the drives.

UNIX to Windows Networking (LAN connection)

On the Windows MDCs, install the NFS server software and configure it for use by the UNIX computers. This procedure can vary. See the documentation with your networking product. You also need a physical networking connection (for example, Ethernet) between the Windows and the UNIX computer, although some Fibre Channel (FC) implementations support conventional networking such as Internet Protocol (IP) over FC.

Experiment with the networking connection to verify that it works properly. Performance will be that of a regular LAN network until SANergy is enabled. Continue only if you are sure of the NFS connectivity from the UNIX computer to the MDC. Check for read and write permissions. You must create NFS shares that match the names of the CIFS shares; otherwise they will not fuse. In addition, the UNIX MDC must start Samba from an accelerated window in order to have fused access to the volumes.

SAN Connection

Install an FC adapter and the associated drivers, wiring, and hubs. SANergy does not offer any acceleration unless it can correctly access the SAN elements. Be aware of the information that is provided by the SAN adapter manufacturer.

Once you install the adapter and verify that the UNIX computer can access the storage elements reliably, install SANergy. Run a disk exerciser that verifies performance and the integrity of the data.

Mount the NFS Volumes

SANergy works with networking products such as NFS. It accelerates network transactions by intercepting and reissuing them over the faster storage area network when possible. SANergy must be aware of the association of a network mount point and the equivalent hard mount point of the storage elements. Refer to your NFS documentation for the specifics on how to mount network volumes successfully. Verify that the NFS volumes mount properly and without errors. Test the volume mounts for correct user access. If the NFS volumes do not mount properly, see your NFS documentation or product manufacturer.

Use one of the following options for NFS mounting:

AIX 5.1

Mount -o acregmin=0,acregmax=0,actimeo=0,noac host:/share_name/mount_point /local_mount_point

AIX 5.2, HP_UX, Solaris, SGI

Mount -o noac host:/share_name/mount_point /local_mount_point

Linux

Mount -o acregmin=0,acregmax=0,actimeo=0 host:/share_name/mount_point /local_mount_p

Notes:
- Some versions of NFS require different mounting options. If the above mount commands do not work, please refer to your operating system, NFS, and networking documentation to correctly mount the NFS volume.
- In Services for UNIX 2, if the share name is one letter, you need the slash (/) in the path. If more than one letter, do not use the / after *host:*
- The share name and volume share names must be the same.

Installing SANergy Special-K

Mount the NFS volumes, and install the SANergy software. See your NFS and networking documentation for information on how to mount network volumes.

Note: If you are upgrading your SANergy software, the installer will uninstall before it runs the Special-K install script.

Installing SANergy Special-K

To install SANergy, perform the following steps:
1. Copy the .tar file to a directory.
2. From a UNIX shell, change to that directory.
3. From the directory mount point, enter:
   > tar xvf <filename.tar>
4. From the same directory mount point, enter:
   > ./install

   After installation completes, a devices.txt file can be created in the SANergy directory.
   (see the "SANergy devices.txt" section below.)
5. NFS mount the volumes that you want to fuse.
6. Change directory to:
   > /opt/SANergy/SANergyconfig   (Solaris, HP-UX)   -or-
   > /usr/SANergy/SANergyconfig   (other UNIX's)

   The Enter Command: prompt appears.
7. Fuse the NFS mount points, by typing: fuse *local mount point*
   The nfs_mount_point parameter is the local mount point that was specified when you issued the NFS mount command.
8. Optional. Repeat Step 9 to fuse additional volumes.
9. Acceleration is now available on the NFS mount points that go to a SANergy MDC volume.
   Be aware of any output generated by the fuse command. If it fails, acceleration does not occur.

SANergy devices.txt

The devices.txt file lists the devices SANergy will access, which can make fusing much faster and limits SANergy to just the devices that it needs to touch. The devices.txt is not required for any of the supported platforms.
1. The file is located in the SANergy install directory:
   > /opt/SANeryg for HPUX and Solaris
   > /usr/SANergy for all other UNIX's
2. The devices paths must be the complete full path from the root directory followed by a return.
   > Typical examples of devices:
   >> HPUX: /dev/rdsk/c22t0d0
   >> AIX: /dev/rhdisk4
   >> Solaris: /dev/rdsk/c1t2d0s2

UNIX MDC Setup Procedure

You might have to configure a variety of computers to share storage in your SAN. Configure one computer at a time and build up the workgroup.

Configure the MDC computers first. Do one at a time. You can set up a single MDC for all volumes, or you can spread the MDC task among several computers. If security and access control are important, configure the necessary parameters on that computer.

Presently, you can mix MDC types on a given SAN. However, on a per-disk basis, the entire disk must be one file system format or the other (either Windows or UNIX).

If you are going to include Windows computers as hosts with your UNIX MDCs, install Samba, a CIFS package, on your MDCs to create shares.

UNIX MDCs (Solaris and AIX) and Samba. It is possible that you need to run the Samba server with **oplock = no** in its smb.conf file. This is the same as NFS users mounting with the **-o acregmin=0...** options. Samba can cache certain information regarding file attributes (such as size) that can sometimes confuse applications that simultaneously open the same file from different machines via SANergy. Setting this or other Samba options depends on the access patterns of your applications and usually is not needed.

To configure an Solaris, AIX, or Linux systems as an MDC:
1. Create the file systems on the shared storage. Partition and format your storage elements. Refer to your UNIX documentation for information on how to format disks.
2. **For AIX MDCs only:** Prior to mounting the volume, run the following commands to set the volume group (which is the name of volume you just created):

   varyoffvg (SAN volume group name)
   varyonvg -u (SAN volume group name)
3. Install the SANergy software. See procedure for Installing SANergy Special-K in this document.

QFS Volumes

If QFS is installed after SANergy, restart the SANergy demon. If the SANergy demon is not restarted, the system might attempt to use the UFS drivers to fuse to the QFS volumes. Install SANergy after QFS, create the following link , and restart the SANergy demon:

For 3.x: ln -s/opt/LSCsamfs/lib/libsamsanergy.so /opt/SANergy/lib/libsamsanergy.so
For 4.x: ln -s/opt/SUNWsamfs/lib/libsamsanergy.so /opt/SANergy/lib/libsamsanergy.so

Using the SANergyconfig Program

The **SANergyconfig** program is a command-line interface that lets you control SANergy Special-K.

Important: The settings do not persist. If you reboot your computer, you will have to reset your settings. To save these settings, you can use the "export" command to create a sanergyconfig.txt file, add the commands to the sanergyconfig.txt file manually OR create a file and boot-time script to redirect the file contents into the sanergyconfig program.

When you start the **SANergyconfig** program, you can use the "help" command to displays the current supported commands and syntax. If you enter a SANergy command without a parameter value, the current settings display. The following table defines the SANergy commands in alphabetical order. The commands are not case sensitive and if parameter values are available for a command, a space or a vertical bar can be used to separate the command from the parameter.

Values entered for byte range type parameters can be entered as the byte value or with a one character non case sensitive size suffix. The available size suffixes are b for bytes, k for kilobytes m for megabytes and g for gigabytes. Example: SANergyconfig hyper on 100m 1g
The example sets hyper extend to be on, hyper1 to 100 megabytes and hyper2 to 1 gigabyte.

Table 5. SANergy Commands

Command	Description
cache	Sets or displays cache parameters.
clear	Clears the fused write and fused read statistics.
exclude	Excludes files from SANergy acceleration.
exit	Exits the program.
export*	Export the current configuration settings to SANergyconfig.txt
fuse	Accelerates a SANergy-managed volume.
help	Displays the SANergy help menu.
hsmdelay	Delays read/write from client if necessary
hyper	Sets the hyper-extension value.
import*	Import configuration settings from SANergyconfig.txt
Lan	Sets the host-to-MDC LAN communication parameters.
lease	Sets the block-lock lease period.
log	Sets or displays the log state. Used for internal and support purposes.
Maps	Sets and displays the current map cache parameters.
maxunalignedxfer	The max size of an unaligned buffer that the system will accept.
Min	Sets the values for the minimum file size to fuse.
Mmap	Sets how SANergy handles mmapcalls.
Neof	Number of map retries when end of file is hit during read.
Onfail	Settings for how I/O errors are handled.
Owner	Assigns or releases device ownership.
Pio	Settings for parallel device I/O.
quit	Exits the program.
Renew	Lease renewal grace period.
sanmem	Checks for errors, gives status, and turns on/off runtime memory error checking

stats	Displays the fused writes and fused reads statistics.
tacitclose	Minimizes LAN traffic
unfuse	Removes accelerated access from a SANergy-managed volume.
updatesize	If a client updates the size of a file the MDC is notified
version	Displays the SANergy version number.
Vstats	Displays verbose statistics and current configuration.
Zfill	Clears unfilled regions of a file to zero.

      * Post 3.2.4.0 fixpacks only

Cache

This command sets or displays the cache parameters.

Syntax

>>-cache|-+-rw--+-|line*size|numlinesperfile|totalcachesize*--------------><
               '-off-'

Options

rw|off
Sets the cache for read write (rw), or turns the cache off (off).
linesize
Specifies the size of each cache line.   The number of lines in dictated by the total size of the cache.
numlinesperfile
This is ignored for now, but a number must be entered to change the cache settings.
totalcachesize
Specifies the maximum amount of system memory that is consumed for caching.

clear

This command clears the fused read or fused write statistics.

Syntax

>>-clear---------------><

exclude

This command excludes from fusing a list of files with specific extensions.

Syntax

>>-exclude|*exclusion_list|hyperexcl|cacheexcl|forceinclude*|---------------><

 Options

exclusion_list
A comma-separated, lower-case list of list of file extensions that are to be excluded from fusing.
Hyperexcl
Specifies which files to exclude from hyperextension. This list prevents SANergy from hyper-extending any file
with the specified extension.
cacheexcl
Specifies which files to exclude from caching.
forceinclude
Forces those files to be cached even if the application opened them with no-caching specified. Not all OS's have
this capability.

Examples:
This example displays the current exclusion list.
  exclude
This example excludes .mov and .doc files.
  exclude|.mov,.doc

exit

This command exits the SANergyconfig program.

Syntax

>>-exit--------------><

export

This command exports the current SANergyconfig settings to SANergyconfig.txt. SANergyconfig.txt is located in the install directory of SANergy. See also import.

Syntax

>>-export-----------><

fuse

Accelerates a SANergy-managed volume.

Note: You must be a root user to fuse volumes.

Syntax

>>-fuse-*local_mount_point*--------------><

or

fuse| (with no parameters displays a list of fused volumes)

Options

local_mount_point
Specifies the local mount point of the volume for accelerated access.

Example

This example connects the volume mounted at /nfs1.

  fuse /nfs1

help

This command displays the SANergy help menu.

Syntax

>>-help--------------><

hsmdelay

On an HSM system, if the client tries to read/write data in a file that is not yet resident, it will delay X milliseconds and retry. Use HSMDELAY to set the value of X.

Syntax

>>-hsmdelay-*delay*--------------><

Options

delay
Specifies the delay value in milliseconds.

hyper

This command sets the hyper-extension values.

Syntax

```
>>-hyper|-+-on--+|hyper1|hyper2--------------><
          '-off-'
```

Options

on|off

Sets the hyper-extension value to on or off.

Hyper1

The first time a file needs to grow, this amount of space will be asked for from the MDC to hold the initial part of the new data. Once this is exhausted, the next time space is needed SANergy will ask for the amount specified by the hyper2 value. Typically hyper1 should be 64k and hyper2 should be 10M or 100M.

Hyper2

Is the same as *Hyper1* except that this value is used from the second hyper request and any subsequent ones for the file.

Example

This example turns hyper-extension on and sets hyper1 to 64k and hyper2 to 100M.

```
hyper on 64k 100m
```

import

This command imports configuration settings from the SANergyconfig.txt. SANergyconfig.txt is located in the install directory of SANergy. See also export.

Syntax

```
>>-import------------><
```

lan

This command sets the host-to-MDC LAN communication parameters. Use this command on the host machines.

Syntax

```
>>-lan|timeout|retries|port----------------><
```

Options

timeout

Specifies the timeout in seconds. The default is 10 seconds.

retries

Specifies the number of retries. The default is 5 retries.

port

Specifies the TCP communication port for SANergy to use. You must use the default value only.

Example

This example sets the host-to- MDC LAN communication parameters to 20 seconds and 10 retries.

```
comm 20 10
```

lease

This command sets the block-lease period. Files that are opened for read-only access need only a few seconds to completely access a file. If the time expires, then they solicit for a new lease. Increasing this value to a large number will mean fewer renewal requests for large files, but the addition of a "disconnect" request during file close (which is skipped if the remaining lease is only a few seconds). The special setting of -1 (read lease only) disables read-leases entirely, which can be useful for some streaming applications. A zero for either value triggers the system to use the default value of five seconds for read operations, and one hour for write operations.

Syntax

>>-lease-*read_time*-*write_time*---------------><

Options

Read_ time
Specifies the number in milliseconds for read operations.
write_time
Specifies the number in milliseconds for write operations.

Example

This example specifies a read time of 5000 milliseconds (5 seconds) and write lease to 3600000 milliseconds (1 hour).

  lease 5000 3600000

log

This command displays and sets the logging level. This is used for internal and support purposes.

Syntax

>>-log-*log_level*---------------><

Options

Log *log_level*
Specifies the logging level. Turn logging on only when you encounter problems.
0 - Disables logging.
2 - Default setting for logging errors.
1-11 - Sets varying levels of logging.

Log file locations are:
HP-UX systems: /var/adm/syslog/syslog.log
AIX systems: /usr/SANergy/mclog0
Linux systems: /var/log/messages
Solaris system: /var/adm/messages

maps

This command displays and sets the map cache parameters.

Syntax

>>-maps-*time*-*number_of_maps*---------------><

Options

time
Specifies the time to map the cache. This time is in seconds. The default is 30 seconds.
number_of_maps
Specifies the number of maps. The default is 100 maps.

maxunalignedxfer

Any unaligned data greater than this size (in bytes) is broken down into chunks of this size and then processed.

Syntax

>>-maxunalignedxfer----------------><

Options

bytes
Specifies the size that you want to break the I/O up into.

min

This command sets the internal values for the minimum file size to fuse.

Syntax

>>-min-*read_size-write_size-getmaponopen-accum-byte*--------------><

Options

read_size

Specifies the minimum file size to fuse for read access. A zero value indicates to fuse all read files.

write_size

Specifies the minimum file size to fuse for write access. Do not set this value larger than a cache-line size.

getmaponopen

Specifies whether or not to get the map on open. 0=disabled, 1=enabled

accum-byte

This is a different method of controlling whether a file fuses for reads. Rather than keying off of the files static size, SANergy will instead allow up to this amount of bytes to go over the LAN before it starts accelerating. Some applications have large files on disk but might only read a very small portion and the overhead of SANergy getting a disk map is too high for such files.

mmap

This command defines how SANergy will handle mmap calls.

Syntax

>>-mmap-lan--------------><
        '-fail-'
        '-bail-'

Options

lan

When an mmap call is encountered pass the call directly over the lan.

fail

Return a failure for the mmap call. Most applications will call read or write if mmap fails.

bail

Close all references to the file on a mmap call and send the call over the lan. SANergy will not "fuse" this file again until the next open call.

neof

If a eof (end of file) is encountered during a read of a file SANergy will retry a map request after the number of eofs indicated. If the file is being read in a read behind write situation then this will allow the writer time to catch up while the reader waits.

Syntax

>>-neof -[Number of retries]-------------><

onfail

Set this to LAN if you want the fused I/O that fails to go over the LAN, set it to RETRY if you want to keep retrying the failed I/O or set it to ERROR if you want the your application to handle the I/O failure. This determines how SANergy handles a physical or communication error.

Syntax

>>-onfail-[lan, error or retry]--------------><

Options

lan

SANergy will put the transaction over the LAN and return whatever the LAN has for a status code.

error

SANergy will report back I/O Error to the application.

retry

SANergy will retry the I/O.

owner

Assigns or releases volume ownership and assigns a tag name to a device.
Also, lists all UNIX MDCs and the devices they own.

Syntax

>>-owner *device-system_name -tag* ----------------><

Options

device
Specifies the device to assign or release ownership, or tag.
system_name
Assigns device ownership to the specified *system_name*.
tag
Specifies the label to assign to the device.
no value
Release device ownership.

Example

This command displays a list of all the devices and owner information.
   owner

Example

This command assigns the system Sol-01 as the owner of the device c1t0d0 and labels the device as UFS.
   owner c1t0d0 Sol-01 UFS
This command assigns the system aix-03 as the owner of the device rhdisk4 and labels the device as JFS2.
   owner rhdisk4 aix-01 JFS2
This command clears the owner assignment on device rhdisk4.
   owner rhdisk4 - -
Note: To release ownership of a device, you must either run the command from the system that owns the device, or the system that owns the device must be offline.

pio

Settings for parallel I/O by SANergy to raw devices.
Syntax

>>-pio [on / off] [Number of threads]-----------------><

Options

mode
Set parallel I/O on or off.
Number of threads
The maximum number of threads used per I/O. The default is 10 and the maximum value is 256. This number is dependent on the size of the stripe group that the client is fusing to and amount of I/O that is taking place concurrently. The threads are kernel level and there is usually an upper limit imposed by the OS.

quit

Exits the program.
Syntax

>>-quit-----------------><

renew

When a lease is about to expire this is the time value when the client begins to ask for a renewal.   If the client has a 30000 ms lease and the renew is set to 10000 ms, when there is 10000 ms left on the lease the client will start asking for a renewal.
Syntax

>>-renew [value in ms]-------------><

sanmem

This command should only be used for diagnostic and support personnel purposes because it activates more aggressive memory checks and statistics that can adversely affect your system performance.

Syntax

>>-sanmem|-+-*walk* |---------------><
              |+-*stats* |
              |+-*check* |

Options

walk
Checks the heap for any errors.
Stats
Displays status|allocated memory|free memory
Check
Turns on/off runtime memory error checking. 0 turns it off. 1-4 turns on checking, 1 being least checks and 4 being most checks. Be advised that this can and probably will slow performance of the software.

stats

Displays the fused write and read statistics, cached write and read statistics, and unfused write and read statistics.

Syntax

>>-stats---------------><

Note: Stats will display fused writes statistics (first number) and fused reads statistics (second number).

tacitclose

If a client is about to close a file and the client's lease on a file is within the desired milliseconds of expiring, the client will not send a close to the MDC in order to minimize LAN traffic. Use TACITCLOSE to set the value of time in milliseconds

Syntax

>>-tacitclose-time----------------><

Options

time
The desired amount of time in milliseconds

unfuse

Removes accelerated access from a SANergy managed volume.

Syntax

>>-unfuse-*volume_mount_point*-----------------><

Options

volume_mount_point
Specifies the volume mount point to remove accelerated access from.

Example

This example unfuses the volume at mount point /nfs1.
  unfuse /nfs1

updatesize

Prior to each I/O the time since the last size update is checked. If the time since the last update has expired then a setsize command is sent to the MDC to keep the file systems file size up to date.

Syntax

>>-updatesize-*time*----------------><

Options

time

The update size timeout in milliseconds.

version

Displays the SANergy Special-K version number.

Syntax

>>-version----------------><

vstats

Displays detailed statistics and current SANergy settings.

Syntax

>>-vstats----------------><

Example:

```
--- Verbose Statistics --
Fused:   Read: 10485760 Write:10485760
Cache:   Read: 0 Write:0  Benefited:0 FilesInUse:0 MemInUse:112
      TimesSequential: 0 Not:0  TimesPunted:0
Unfused: Read: 0 Write:0
Maps:    InCache:0  Hits:0
Memory:  InUse:1056624   Free:0
LAN:     Nmsgs:5   NcommErrs:0 NmisMatch:0 Noverflow:0
 ??         Sent:0  Received Resp:0
 GetVolume    Sent:1  Received Resp:1
 InitialMap   Sent:2  Received Resp:2
 ExtendedMap  Sent:0  Received Resp:0
 SetSize      Sent:0  Received Resp:0
 Close        Sent:2  Received Resp:2
 Dump         Sent:0  Received Resp:0
Number of files processed (GetInitialMaps): 2
Number of files processed with ZERO I/O 0
Times IO stalled 0 DMA stalled:0
UsrIO: 1m:20
fsfIO: 1m:20
PhysIO: 32k:6 64k:4 512k:4 1m:16
realIO:
dmaIO:
Average bytes processed per file: 10485760
Processing Density ( r+w / filesizebytes )  20971520 / 20971520
------------- Settings -------------
Hyper1:104857600 2:104857600 ReadLease:3600000 Write:3600000
TacitClose:0 Renew:10000 UpdateSize:5000 Neofs:2
Log:2 File: HSMdelay:4000 zfill:1
Min read:0 write:0 accum:0
LAN: timeout:15 retries:20 port:5501
Maps: GetOnOpen:1 MaxCache:0 Time:30000
IOQ: 30  ndma:16
Cache: Mode:RW LineSize:1048576 LinesPer:3 MaxMemory:10485760
OnFailure:RETRY mmap:BAIL MaxUnaligned:2097152 MultiPath:OFF
Exclude: Fuse: Hyper: Cache: ForceInclude:
parallelio: pio:ON pioThreads:10
```

zfill

Set to 1 so that new regions of file will be zero filled for security. Set to 0 to turn off zero filling.

Syntax

>>-zfill-[1 or 0]----------------><

Options

1 Enables or 0 Disables zero filling.

Running SANergyconfig

You can run **SANergyconfig** as a text line application, or you can pass a script file into it. The following procedures describe both ways to use **SANergyconfig**.

SANergyconfig allows you to use script files. To use it, do one of the following:
- Pass SANergyconfig a script file. This is the recommended method.
- Use single commands (text line application) as command line arguments.
-

Passing SANergy a script file

To pass SANergy a script file, use the following steps:
1. Edit the SANergyconfig.txt script file for your environment to include the shared volumes that you want to fuse.
   To edit the script, enter the following command:
       vi SANergyconfig.txt
   Or open the file in a text editor.
2. The SANergyconfig.txt window appears. A sample FUSE command could be:
       FUSE */nfs1*
       (Other FUSE commands for other shared volumes you want to fuse)
       EXIT| (end every script file with the EXIT command)
     The */nfs1* is the local mount point of a NFS volume.
3. Save and exit the SANergyconfig.txt script file.
4. Do one of the following:
   - For Solaris and HP-UX, type: ./opt/SANergy/SANergyconfig < SANergyconfig.txt
   - For AIX, type: ./usr/SANergy/SANergyconfig < SANergyconfig.txt

Using single commands

To enter a single command, perform the following steps:
   1. Do one of the following:
           For Solaris and HP-UX, type: opt/SANergy/SANergyconfig
           For AIX, type: usr/SANergy/SANergyconfig
       The **Enter Command:** prompt appears.
   2. Type: fuse */nfs_mount_point*
   The *nfs_mount_point* parameter is the local mount point that you specified when you issued the NFS **mount** command.

Be aware of any output generated by the **fuse** command. If it fails, acceleration does not occur.

Log files

The SANergy driver writes important information to a log file that varies by platform as follows:
       HP-UX systems: /var/adm/syslog/syslog.log
       AIX systems: /usr/SANergy/mclog0
       Solaris systems: /var/adm/messages
       Linux systems: /var/log/messages

Check this file for any accumulating messages. You also can turn on the tracing information using the SANergyconfig program that writes to this file. Use this to determine how well your programs are running in the SANergy environment.

Running the built-in performance tester
Ensure that you run the command line version of the performance tester from a SANergy fused window. To run the built-in performance tester, perform the following steps:
1. Do one of the following:
   For HP-UX and Solaris, enter the following:
       cd /opt/SANergy
   For all other UNIX, enter the following:
       cd /usr/SANergy

2. Enter: ./perf   or   ./perf [filename to fuse] [size of record in KB] [size of file in MB]
     The following help appears:

   Command line usage: perf -o [r,w,wr,a] -b [] -s [] -l [] -v [] -d filename
       -h   Print this help message and exit
       -o   File mode: (Default "wr"
            r - read (O_RDONLY)
            w - write (O_WRONLY | O_CREAT | O_TRUNC)
            wr - write then read.
            a - append (O_WRONLY | O_APPEND)
       -b   Record size to read or write (size[k,m,g]). (Default 1m)
       -s   Total IO to perform (size[k,m,g]). (Default 100m)
       -l   Number of loops. (Default none). (-1 loop infinitely)
       -d   Do direct IO (0 or 1). (Default 1)
       -a   Do aligned IO (0 or 1). (Default 1)
       -v   Validate character ('-' for ramp). (Default none)
      EX: perf -o wr -b 1m -s 100m -d /nfs/test

   Press Enter to continue interactive setup or "q" to exit.

3. The intention of perf is to run it directly from the command line.

   Example 1:
       perf –o w –b 1m –s 100m –l 10 /nfs/test
      Write /nfs/test 10 times in a loop with a size of 100Mb using a 1Mb buffer.

   Example 2:
       perf –o wr –b 1m –s 100m –l 10 –v t /nfs/test
      Write and read /nfs/test in a loop and use a t as a verification character.

Limitations:
mmap()" - Not yet supported.

Uninstalling SANergy on all UNIX Computers
Note: Uninstall SANergy only if you are disconnected from the SAN network. This assures that there is no risk of data loss that is ordinarily protected by SANergy. Before uninstalling, ensure that you are not in the SANergy directory.

To uninstall SANergy on UNIX computers, perform the following steps:

1. Bring up the UNIX shell and log in as the superuser. Enter:
       su root
       Password: *<root_password>*
2. Remove all references to SANergy from the **.profile** and **.login** files, if you edited them.
3. Do one of the following:
   For HP-UX and Solaris, enter the following:
       /opt/SANergy/uninstall

   For all other UNIX, enter the following:
       /usr/SANergy/uninstall

   Note: Solaris and AIX support the native installation tools also.