

IBM TotalStorage™ NAS 200  
Model 25T



# Release Notes For Release 2.7

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This edition applies to Release 2.7 of the IBM 5194 TotalStorage NAS 200 Model 25T (product number 5194–25T).

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## Release notes

This document contains the release notes for the Release 2.7 for the IBM TotalStorage™ NAS 200 Model 25T, hereafter referred to as the NAS 200.

Refer to [www.ibm.com/storage/support/nas](http://www.ibm.com/storage/support/nas) for possible updates to these release notes and for copies of the base documents.

Refer to [www.ibm.com/storage/support](http://www.ibm.com/storage/support) for translated version of this document.

The 2.7 CD includes these drivers:

- ServeRAID™ 5.11.01
- Intel PROSet II Version 5.3.42.0
- Alacritech SLICuser Package 5.34
- Drivers and firmware upgrades:
  - ServeRAID Driver Version 5.11.01
  - Intel Ethernet Gigabit Version 6.2.21.0
  - LSI On-board SCSI Version 1.8.12
  - Alacritech Quad-Port Ethernet Adapter
    - Alacritech ATCP Driver Version 5.34.0.0
    - Alacritech Simba Driver 5.32.0.0
  - Adaptec SCSI LVD Win2k Device Driver Version 4.10.4000

## Known problems and solutions

For Release 2.7, there are several known problems. Table 1 lists these known problems and suggested solutions.

Table 1. Known problems and solutions

Abstract	Problem	Solution or workaround
Problem installing Veritas Backup Exec	<p>During installation of Veritas Backup Exec 8.6, the program attempts to create a new cluster group and move resources (like the shared drive) into a group called Backup Exec. During this process, Veritas installation aborts with the following error message: Severe - Error in Creating the Cluster Group.</p> <p>This problem may also happen when you are using the Cluster Administration tool or Cluster.exe tool to try to add a network resource name that contains an underscore (_) character; you might receive an error message that indicates that the resource name contains invalid characters.</p>	Workaround: The workaround currently is to manually create the groups in the Cluster hive or not use the "underscore" character.
Server Wizard appears during the login process	When logging on to the NAS Appliance using Administrative User other than the default "Administrator" account, a Wizard dialog is invoked, prompting you to configure the server.	This is normal behavior when a new Administrative User logs on to the NAS Appliance. A Server to-do list is created every time a new Administrative User logs on to NAS 200. Bypass the wizard and use the IBM NAS Admin.msc to configure the Appliance.

Table 1. Known problems and solutions (continued)

Abstract	Problem	Solution or workaround
Disk Wizard completes with error	If invoking the Microsoft Disk Manager when the Appliance has a hardware RAID Solution, and no external Fibre Channel storage is attached, the User sees a Wizard for writing a signature to a drive that is detected. The User finishes the wizard and gets an error on completion that Disk "0" is unknown.	This is normal behavior on Fibre Channel and RAID-based Appliances. Hook up the Fibre Channel connection to the HBA and it should detect any configured external Logical Volumes. <b>Note:</b> The "Unknown disk" is the "Pseudo disk" in Device Manager and is used by Fibre HBA.
Plug-in does not start	When selecting plug-ins in the IBM NAS Administration console, the required plug-in does not start.	Right-click the plug-in; then click <b>Refresh</b> . This is standard Microsoft Management Console (MMC) behavior.
IBM Appliance Advance Configuration Utility	The IBM Appliance Advance Configuration Utility (IAACU) console does not allow the creation and placement of the Appliance within a designated group or family.	This is normal behavior when the IAACU Console has been updated to support the latest appliances. This may be addressed with a future release of the console.
FTP virtual directory is not displayed in directory listing	A virtual directory in an FTP site cannot be seen by the client.	Visit the Microsoft Web site for a workaround to view the contents of an FTP virtual directory.
ServeRAID Agent terminated unexpectedly	When the appliance shuts down, the ServeRAID agent logs an event to the System Event Log that the agent has shut down unexpectedly.	This is normal behavior for the ServeRAID agent, and the agent starts normally when the appliance is turned on.

## Functional notes

The following sections contain functional information.

### NFS share configuration in Server Appliance Kit

#### Error when assigning client group to an NFS share

When assigning a client group to an NFS share, you get the message:

The client machine name XXXX could not be resolved.

(where XXXX is the *name* of a defined client group)

To work around this problem, either:

1. Assign the IP address of the machine instead of using the client group name, OR
2. Use the desktop interface by navigating to the actual folder that you want to share using Windows Explorer; then right-click the folder and select **Sharing**.

#### Error when assigning machine IP address to an NFS share

When assigning a machine IP address, you get the message:

The client machine name XXXX could not be resolved.

(where XXXX is the *IP address* of a client on your network)

To work around this problem, either:

1. Ensure that the client machine is on the network and that you can ping it, OR

2. Use the desktop interface by navigating the actual folder that you want to share using Windows Explorer; then right-click the folder and select **Sharing**.

## Re-establishing SNMP service

The SNMP Service has been turned off in Release 2.7 to increase performance and security. This service can easily be turned on by following these steps:

1. Use Terminal Services or attach a monitor, keyboard, and mouse to the appliance
2. Double-click **IBM NAS Admin Snap-in**.
3. Expand Maintenance and click **Services**
4. Right-click **SNMP Service** and select **Properties**.
5. Set Service to “Automatic” or “Manual” (default is “Manual”); then click **Apply**.
6. To start SNMP service, click **Start**.

## Persistent Storage Manager Notes

### FAT32 file system functional limitation

Persistent Storage Manager (PSM) will not allow a Persistent Image (snapshot) to be taken of a FAT32 file system formatted volume. The Maintenance (D:) partition is formatted FAT32 by default, to allow system restore from a DOS boot disk by a backup of the system volume (C:) stored as a file on D:. Therefore D: must be formatted FAT32. The NAS Backup Assistant can be used to back up C: to D: using a PSM-generated snapshot to allow backup of open files. However, a PSM snapshot-assisted backup of D: is not possible because D: must be a FAT32 volume, and attempted snapshot-assisted backups of D: will fail.

You can back up D:, if you do not use PSM. Backups of D: which do not use PSM to generate a snapshot will succeed as long as other variables (such as sufficient space available on the destination volume) are correct.

### Command line interface

PSM uses several system-level files, one of which has a command line interface. Use of this is supported only for IBM-provided applications and services, as well as allowing IBM support technicians to assist in debugging problems. All PSM function (including sophisticated scheduling and automation of remote management) is provided by the Graphical User Interface described in the User's Reference.

### PSM failure to take a snapshot

Defragmentation of managed storage is often an essential maintenance task for Windows machines. Defragmentation of a NAS which is using PSM is complicated by the data protection activity of PSM. PSM caches all the old data being overwritten by the extra write traffic generated by the defragmentation engine. Therefore, defragmentation of volumes with snapshots managed by PSM is disabled: the defragmentation engine will complete and report success, but the volume will be unchanged. However, defragmentation remains necessary, and PSM will even cease taking snapshots if its cache file becomes too fragmented, reporting the following errors to the System Event Log:

```
<date/time> psman5 Error None 4135 N/A <mach.name> A persistent image could
not be created due to error 0xe000103f.
<date/time> psman5 Error None 4159 N/A <mach.name> Cannot create PSM files
because the volume is too fragmented.
```

To successfully defragment the volume, delete all snapshots on the volume (ensure you have a valid backup on hand) using the PSM GUI. PSM allows defragmentation of the volume; however, the PSM Cache files still remain fragmented, and you will

not be able to create snapshots. To enable snapshots, you must delete the PSM Cache files on the defragmented volume. PSM automatically rebuilds them.

**Attention:** NEVER delete or alter the PSM Cache files or directory on a volume that still has snapshots.

#### **Cache Deletion Procedure:**

1. Open Windows Explorer and click the defragmented volume under “My Computer” so that the top-level contents of the volume are displayed in the right pane. Click **Windows Explorer→Tools→Folder Options**. Select the View tab. Ensure that **Show Hidden Files and Folders** is selected, and that **Hide protected operating system files** is not selected. Click **OK** to close and apply the Folder Options settings.
2. Press the F5 function key to Refresh the top-directory volume contents. You should see a folder named “Persistent Storage Manager State.” Right-click the directory and select **Properties**. Select the Security tab. Select **Administrators** in the Name field. Ensure that **Full Control** is checked in the permissions field; the other permissions should automatically become selected. Click **OK** to save the security settings and close.
3. Right-click the folder named “Persistent Storage Manager State” again, and select **Delete**. Click **Yes** at the pop-up warning. Then, right-click the Recycle Bin icon and select **Empty Recycle Bin** to complete the deletion of the PSM Cache directory and contents.

PSM should be now able to take snapshots again. Creating the first snapshot will take a little longer as PSM rebuilds the cache file.

#### **Known issues**

1. If a re-extended volume (containing True Images of the pre-extended volume) is reverted, the re-extended area of the disk is unusable. To reclaim this space, executed the “reextend.exe” utility after reverting from a True Image of the pre-extended volume. This utility is available in the directory: “c:\winnt\system32\serverappliance”. Use this utility by typing “reextend -?”.
2. For a volume that can no longer be accessible, Cluster service fails-over to another node. During an image revert operation, PSM must disable the target volume. By disabling the volume, Cluster service assumes that the volume has failed and proceeds with a fail-over while PSM is reverting the image. Therefore, you might want to increase the default Pending Timeout value for the Cluster to a number that works for your specific system.
3. During a PSM revert operation in a cluster environment, if the volume times out and is made unavailable, the revert operation can not finish and data on the original volume is incomplete. In some cases, the volume can no longer boot. However, reissuing the PSM revert operation and allowing it to finish returns the volume to the previous state. For this situation , you might see the following event log messages:  
 Persistent Storage Manager recovery encountered error 3221226026 inserting key (20A0C7:FB) into dictionary.  
 D:\snapshot\snapshot.0 is not accessible. The disk structure is corrupted and unreadable.
4. The event log error “a driver below this one has failed in some way for” may occur when the cache file is full.
5. If all your Persistent True Images on “C:” are tagged as Always Keep, and the cache file fills up, the system might experience a BSOD at reboot. It is not

recommended to flag all Persistent True Images as Always Keep because this disallows the deletion logic of PSM to delete the older Persistent True Images to free up cache file space.

6. Default cache setting not being displayed correctly. For example, if you set cache file % for Volume setup page, say 2%; then take a Persistent True Image, the value greys out and is not selectable. Then you select restore default settings, it changes to 20%, you click OK, then go back to that page and the screen shows 2% not 20%. You must delete Persistent True Images before increasing the Cache size.
7. In certain cases where the IBM NAS is under load, Persistent Storage Manager might fail to automatically delete the last snapshot on a volume when the cache file fills up. The volume typically has one snapshot outstanding when the cache file exceeds the deletion threshold. At this point, if the system is experiencing heavy file system load, the write volume prevents PSM from successfully deleting the last snapshot before the cache reaches 100%. At this point, the last snapshot must be deleted manually to return to normal operation. The cache file should then show 0% utilization through the PSM interface (if not, try restarting the Terminal Services client by closing the window and re-opening it) and PSM operation should proceed normally. If the issue remains or the cache does not go to 0% utilization, please call IBM service.

## Limitations

1. Only NTFS volumes are supported by PSM.
2. The Page file size must not change and the initial size must be set equal to the maximum size. This setting is located in the Virtual Memory settings under System Properties.
3. If the system cannot boot, the revert ability cannot be performed.
4. PSM automatically disables the ability to revert the system boot drive.
5. Microsoft confirmed that the NFS Services for UNIX does not support volume mount points. The NFS clients are not able to access data on volumes mounted using a volume mount point. Because Persistent True Images for a volume are mounted as directory junctions (mount points), and although they are shared using NFS, the NFS clients are not able to access the Persistent True Image data. Refer to Release Notes for Microsoft Server Appliance Kit dated June 2001.

## Disaster recovery help file inaccurate

Use of the NAS Disaster Recovery feature for backup of the C: to a local FAT32 partition (D:) or a network share requires the creation of a boot diskette. The diskette is used to boot the recovering NAS and includes a DOS-based operating system, as well as the location of the image of C: from which to restore. You must make this diskette bootable. The NAS Administration GUI online help text inaccurately indicates that this can be accomplished with a menu option in Windows® Explorer. The correct method is as follows (excerpted from the *User's Reference*):

1. Insert a blank, formatted diskette in the diskette drive of the node.
2. On the Disaster Recovery page, click **Create Disk**.
3. Click **OK** on the Create Recovery Disk page. The diskette drive LED will turn off when the creation is complete. The diskette creation should take no more than two minutes.
4. The utility makes the disk DOS-bootable. From a command prompt, either through the desktop of the node itself (with the diskette still in the diskette drive of the node), or on another system with the diskette in its diskette drive, type:

a:\fixboot.exe

and answer the prompts.

5. Remove the diskette from the appropriate diskette drive. Label the diskette appropriately and keep it in a safe place.

## Powering on the NAS 200 and the 5194-EXP Storage Units

This procedure replaces the section titled “Powering on the appliance” in the *IBM TotalStorage Network Attached Storage 200 Hardware Installation Guide*, and the sections titled “Powering on the NAS EXP after an emergency” and “Powering on the NAS EXP” in the *IBM TotalStorage Network Attached Storage 200 Storage Unit Model EXP Installation and User’s Guide*. This procedure applies to the IBM TotalStorage Network Attached Storage 200 and EXP.

To power on the NAS 200 and the NAS EXP:

1. Verify that:
  - There is no visible damage, in the event of an emergency powering off. If there is damage, have the unit serviced.
  - All cables are correctly attached.
  - All power cords are plugged into the back of the NAS 200 engine (3 cords) and optional 5194-EXP Storage Units (2 cords).
  - All hard disk drives are locked securely in place.
  - All switches on the optional 5194-EXP Storage Units are set correctly: the internal option switches 1 through 4, external option switches 1 through 5, and the unit ID switch. For more information on these switch settings, refer to the section titled “Setting the interface options and ID settings” in the *IBM TotalStorage Network Attached Storage 200 Storage Unit Model EXP Installation and User’s Guide*.
2. Wait at least 20 seconds after connecting the power cords.
3. Power on the appropriate device:
  - If you are restarting the engine when all optional NAS EXPs are already recognized by the ServeRAID controller (for example, after a power failure), power on the devices in this order:
    - a. NAS EXPs
      - 1) Switch on both power supplies in the back of the NAS EXP.  
The NAS EXP might take a few seconds to power on. During this time, you might see the fault (amber) and the power (green) LEDs on the NAS EXP turn on and off intermittently.
      - 2) When the power-on sequence is complete, verify that only the power (green) LEDs on the front and back are on. If one or more fault (amber) LEDs remain on, refer to the “Troubleshooting” section of the *IBM TotalStorage Network Attached Storage 200 Storage Unit Model EXP Installation and User’s Guide*.
    - b. Engine
      - 1) Press the power button on the front of the engine to power on the appliance.



**Attention:** The first time you start the appliance, a series of configuration and system preparation programs that finish configuring the *Network Operating System* (NOS) run automatically. These programs must complete before you use any included applications to connect to or configure your appliance. Wait at least 5 minutes before connecting to or configuring the appliance after the initial system start.

- 2) Verify that the the Power-on LED is **on** and the Information LED and System Error LED are both **off**.

**Note:** Depending on the system status, other LEDs might be on.

If a problem is detected during the diagnostics, refer to the *IBM TotalStorage Network Attached Storage 200 User's Reference*.

- If you are not using a NAS EXP, power on the engine using the procedure in step 3b on page 6.
- If you are adding one or more new NAS EXPs, then power on the devices in the following order:
  - a. Already recognized NAS EXPs. These are any NAS EXPs that are already recognized by the ServeRAID controller (see step 3a on page 6 for instructions explaining how to start the NAS EXPs).
  - b. Engine (see step 3b on page 6 for instructions explaining how to start the engine).
  - c. New NAS EXPs. These are all NAS EXPs that are new to the configuration and not recognized by the ServeRAID controller (see step 3a on page 6 for instructions explaining how to start the NAS EXPs).

## Operating system doubles the number of physical CPUs

The NAS 200 incorporates the latest Intel Xeon processors which use a new technology called Hyperthreading. Hyperthreading allows one physical CPU to run multiple threads simultaneously, as if it was two CPUs. Because of this, each physical processor looks like two logical processors to the operating system. This can be confusing when observing that the BIOS reports the system has one or two CPUs, and Windows reports that the system has two or four CPUs, respectively.

## RAID Array A factory default configuration drive sizes

In the "Additional administrative functions " chapter of the *User's Reference*, there is a table titled "RAID Array A factory default configuration". The drive sizes that are given in the table apply only if the hard disk drives are 36G drives. For clarification, add a Note 3 to the bottom of the table to read:

If the installed drives are 73G or 146G, the sizes are doubled for the System and Maintenance Logical drives (for example, the drive size would be 12288 MB for Logical Drive 1 (System), and the drive size would be 24576 MB for Logical Drive 2 (Maintenance)).

## Optional procedure for ServeRAID configuration backup incorrect

In the section titled "Backup and restoration of the ServeRAID storage configuration" of the *IBM TotalStorage NAS 200 Model 25T User's Reference*, provides two different procedures:

- Backing up from the command window
- Backup up from a bootable DOS diskette

The procedure for "Backing up from command window" should not be used. The procedure for "Backup from a bootable DOS diskette" should always be used.

## UPS service error

On the Status of the Windows 2000 for NAS GUI, you will see that the UPS service has been stopped.

**Note:** This is the default state of this service on the NAS GUI. In addition, the "Uninterruptible Power Supply" must be set to **Manual** in the **Control Panel→Administrative Tools→Services**. UPS Service must be enabled before you can use your uninterruptible power supply device. Do **not** enable the UPS Service unless you have an uninterruptible power supply device attached to your appliance.

The process to correctly configure and enable the UPS Service using the Windows 2000 for NAS GUI follows:

1. Attach your customer-provided RS-232 cable from your uninterruptible-power-supply hardware to an available COM Port on your NAS appliance.
2. To set "Uninterruptible Power Supply" Control Panel Service to "Automatic" and "Start":
  - a. Log in to the NAS appliance through the Terminal Services Client.
  - b. Click **My Computer→Control Panel→Administrative Tools→Services** and highlight "Uninterruptible Power Supply" service.
  - c. Right-click **Service**, go to Properties, and then set Services to "Automatic."
  - d. Click **Apply**; then, to start the service, click **Start**.
3. To configure uninterruptible-power-supply connections and enable service using the Windows 2000 for NAS GUI:
  - a. Click **Maintenance → UPS**.
  - b. Select the manufacturer, model, and COM port to which your uninterruptible power supply device is attached.
  - c. Select the **Enable the UPS service on this appliance** check box and click **OK**.

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## Administration notes

This section contains administration information.

## NAS Setup Navigator

Release 2.7 includes the NAS Setup Navigator configuration tool. The NAS Setup Navigator maps out the initial configuration tasks and leads you through the tasks in the proper order. The tool detects which NAS appliance it is running on and adjusts the menu and content appropriately. You can follow links to more in-depth information and to the configuration panels used to perform the steps. You can also tailor the instructions to fit your needs by selecting optional topics. To start the NAS Setup Navigator, click on the NAS Setup Navigator icon on the desktop.

## NAS Admin tool

If users other than the local machine Administrator have administrative privileges and will need to use the NAS Admin tool, this file must be copied to that user's Desktop folder. Example:

```
copy "c:\Documents and Settings\Administrator\Desktop\IBM NAS Admin.msc"
"c:\Documents and Settings\<user name>\Desktop"
```

## IBM Director

NAS Version 2.7 includes the IBM Director 3.1.1 agent in the preloaded software. The 3.1.1 designation means that the IBM Director 3.1 agent is installed as well as the IBM Director 3.1 Service Pack 1. If you intend to use the IBM Director Server to manage your NAS product, ensure that your IBM Director Server and Console are at the 3.1 version and you must install the IBM Director 3.1 Service Pack 1 on your IBM Director Server and Console.

For more information about obtaining the IBM Director 3.1 Service Pack 1 for your IBM Director Server and Console, visit [www.ibm.com/pc/support](http://www.ibm.com/pc/support) and click **Systems Management**.

Supplementary CD 1 contains NAS-specific extensions to the IBM Director Server to assist you in managing NAS appliances using the IBM Director Server. These extensions are identified as "IBM NAS Extensions for IBM Director." One of the features within these extensions creates an IBM NAS Appliances group on the IBM Director Console, which allows you to manage NAS appliances as a group, but the version of these extensions on the CD might not include the most current NAS products. For the latest version of the IBM NAS-specific extensions to the IBM Director Server, visit [www.ibm.com/storage/support/nas](http://www.ibm.com/storage/support/nas).

The section titled "Rack Manager and inventory enhancements" in the User's Reference describes enhancements to recognize IBM NAS components in the Rack Manager Task of the IBM Director Server and indicated that these enhancements were available through the application of the IBM Director Server 3.1 Service Pack 1. These enhancements are not available in the IBM Director Server 3.1 Service Pack 1, but will be made available in a future IBM Director deliverable. For more information about IBM Director deliverables, visit [www.ibm.com/pc/support](http://www.ibm.com/pc/support) and click the link for **Systems Management**.

## Uninterruptible power supply support

Release 2.7 includes support for uninterrupted power supplies. Uninterrupted power supply devices provide emergency backup power for a specific period of time when the local power fails. This power comes from batteries housed within the device. High-performance surge suppression helps protect your appliance from electrical noise and damaging power surges. During a power failure, the uninterrupted power supply is designed to instantly switch your appliance to emergency battery backup power. After you have installed an uninterrupted power supply for your appliance, you can set options for its operation using the UPS Task on the Maintenance page. The UPS Task enables you to control how the uninterrupted power supply service works on your appliance. The available UPS Settings depend on the specific uninterrupted power supply hardware installed on your system. Before you use your uninterrupted power supply device, type the following information on the UPS Configuration page:

- Uninterrupted power supply device manufacturer
- Uninterrupted power supply device model
- The serial port to which the uninterrupted power supply device is connected

To configure the uninterrupted power supply service, see "UPS service error" on page 8.

To help protect your appliance from power failures, test it by simulating a power failure by disconnecting the main power supply from the uninterrupted power supply device. Do **not** perform this test during production use. Your appliance and

peripherals connected to the uninterrupted power supply device should remain operational, messages should be displayed, and events should be logged. Wait until the uninterrupted power supply battery reaches a low level to ensure a proper shutdown occurs. Restore the main power to the uninterrupted power supply device, and check the event log to verify that all actions were logged and there were no errors. All detected power fluctuations and power failures are recorded in the event log, along with uninterrupted power supply service start failures and appliance shutdown initiations. Critical events might change the status of the appliance.

## Configuring LAN-free backup when using TSM Server v4.2.2

The NAS 200 Model 25T is preloaded with TSM Client, TSM Agent and TSM Driver Version 4.2.2. When also using TSM Server Version 4.2.2 on a separate server, configuring the Model 25T to use LAN-free backup to a tape library can be difficult. To ease this configuration, a TSM macro file is supplied on the Supplementary CD as file: “\tsm\_scripts\tsm\_lan\_free.mac”. The file contains instructions for using it during the configuration process.

## Configuring page files for optimization

NAS appliances are based on a Windows Powered Operating System and has a default pagefile of 1024 MB that is located on the boot system drive “C:”. This default size is based on a minimum base memory configuration for all IBM TotalStorage appliances and preloaded software. Memory options can vary on each NAS appliance depending on what you have ordered.

By default, Windows Powered places the pagefile on the boot partition where the operating system is installed. The pagefile is not a shared disk, but a local disk for the clustered systems. To determine the size of the pagefile, multiply the amount of physical RAM by 1.5 to a maximum of 4095 MB. However, placing the pagefile on the boot partition does not optimize performance because Windows has to perform disk I/O on both the system directory and the pagefile. Therefore, it is recommended that you place the pagefile on a different partition (such as the maintenance partition) or a different physical hard disk drive, so that Windows Powered can handle multiple I/O requests more quickly. It is highly recommended that on the NAS appliances, the pagefile be increased by adding to the Maintenance Partition. The size will vary depending on the physical memory installed on the appliance. You can check memory by right-clicking **My Computer**→**properties**. This opens a System Properties window, and the memory will be displayed. This can be performed through Terminal Services or by connecting a monitor, keyboard, and mouse to the appliance.

**Note:** Do not remove the pagefile from the boot partition. Removal will not allow Windows to create a crash dump file (Memory.dmp) in case a kernel mode STOP error occurs. Not having this crash dump file could lead to extended server downtime if the STOP requires a debug operation to be performed.

The optimal solution is to create one pagefile on the boot partition using the default settings and create one pagefile on another, less frequently used partition. The best option is to create the second pagefile so that it is on its own partition (such as maintenance partition), with no data or operating system-specific files.

Windows Powered uses the pagefile on the less frequently used partition over the pagefile on the heavily used boot partition. Windows Powered also uses an internal algorithm to determine which pagefile to use for virtual memory management. In the above scenario, the following goals of the page file are served:

- The system will be properly configured to capture a Memory.dmp file if the computer experiences a kernel mode STOP error.
- The page file on the less frequently used partition will be used the majority of the time because it is not on a busy partition.

Another advantage of using a pagefile on its own partition is that the pagefile will not become fragmented. If the pagefile is on a partition with other data, the pagefile might experience fragmentation because it expands to satisfy the extra virtual memory required. A defragmented pagefile leads to faster virtual memory access and improves the chances of capturing a dump file without significant errors.

## Checking Persistent Storage Manager version

The only reliable way to verify the version of PSM on your system is to execute the following on a command prompt local to the NAS:

```
c:\winnt\system32\serverappliance\ss -version
```

An example of the output from this command executed on a system with PSM version 2261 + 2263 QFE installed is:

```
C:\WINNT\system32\ServerAppliance>ss -version
ss - Snapshot Command line management utility
Copyright (c) 2000-2002 Columbia Data Products, Inc. All Rights Reserved.
```

```
IBM version
LoVersion = 0x00000200
Version   = 2.20 build 2262
Eval      = no
```

```
Date/Time      Version      File
7/26/2002 12:19 2.20.00.2261 'C:\WINNT\system32\ServerAppliance\psmlapi.dll'
8/13/2002 11:36 2.20.00.2263 'C:\WINNT\system32\ServerAppliance\ss.exe'
7/26/2002 12:19 2.20.00.2261 'C:\WINNT\System32\psmready.exe'
8/06/2002 6:18 2.20.00.2262 'C:\WINNT\System32\drivers\psman5.sys'
7/26/2002 12:19 2.20.00.2261 'C:\WINNT\System32\serverappliance\mui\0409\snapshot.dll'
7/26/2002 12:19 2.20.00.2261 'C:\WINNT\System32\serverappliance\PSMCom.dll'
7/26/2002 12:19 2.20.00.2261 'C:\WINNT\System32\serverappliance\drbackup.dll'
```

## Updated information on Supplementary CDs

This information replaces the information in the section titled “Using the Supplementary CD” in Chapter 8 of the *User's Reference*.

The Supplementary CDs contain documentation and copies of key software applications that are preinstalled on the NAS 200. Table 2 and Table 3 on page 12 include the names of the directories found on the Supplementary CDs and a description of the contents of each directory.

Table 2. Supplementary CD 1 directories

Directory name	Contents
DB2®	<ul style="list-style-type: none"> <li>• EnableDB2Support.exe</li> <li>• DisableDB2Support.exe</li> </ul> <p>These files enable and disable support for Linux- and Solaris-based DB2 clients using NFS shares.</p>

Table 2. Supplementary CD 1 directories (continued)

Directory name	Contents
DiskImages	<p>This directory contains a diskette image for the Recovery Enablement Diskette and diskette image for a bootable diskette that automatically configures the ServeRAID controller and drives.</p> <p>To create the Recovery Enablement Diskette, run enablement_diskette291.EXE and insert an HD 1.44 floppy diskette into drive A: when prompted.</p> <p>To create the bootable diskette to automatically configure the ServeRAID controller and drives, run IBM_NAS_AutoRAID_diskette_2.9.EXE and insert a HD 1.44 floppy diskette into drive A: when prompted.</p>
diskpart Samples	This directory contains an example script for use with the DiskPart utility. This script will clean disk 2, convert it to dynamic, partition it, and assign drive letters to the partitions. This script is unsupported and should be used with extreme caution.
IBM Advanced Appliance Configuration	Run Setup.exe on the machine from which you will administer the appliance. The agent is preinstalled on the appliance.
IBM NAS Extensions For IBM Director	The IBM NAS extensions to IBM Director provide capabilities to IBM Director that are specific to the IBM NAS appliances.
Zip Tools	This directory contains compression tools used for sending information to IBM technical support.
readme.txt	This text file describes the contents of the Supplementary CDs.

Table 3. Supplementary CD 2 directories

Directory name	Contents
AoP	This is the add-on pack for the Server Appliance Kit.
SFU_2073.1	<p>Microsoft® Services for UNIX® (SFU) Version 2.2 support files::</p> <ul style="list-style-type: none"> <li>• QFE 320175 for performance enhancements</li> <li>• QFE 321096 for SAK and SFU performance enhancements</li> </ul>
readme_SFN5.txt	Instructions for installing Microsoft File and Print Services for NetWare 5.0.
Terminal Services Client	Microsoft Terminal Services Client installation files.
w2ksp2	Windows 2000 Service Pack 2.

## Fibre Channel adapter event logs

You can view event logging for the Fibre Channel adapter for troubleshooting problems using the event viewer. The detailed event code is displayed at offset 34 (hex). Table 4 on page 13 gives a list of detailed event codes for the adapter. For some of the event codes, additional data will be recorded in the least significant 16 bits of the longword. Additional data might also be recorded in the longword at offset 10 (hex).

Certain codes will be logged only if you set a Fast!UTIL parameter to enable additional event logging. These codes are indicated by an asterisk (\*). By default, these events are not logged.

If an error occurs that is not listed in Table 4 on page 13, contact the IBM Support Center (1 800 426-7378 in the U.S.). In all other countries, contact your IBM reseller or IBM marketing representative.



Table 4. Fibre Channel adapter error codes

Event code offset 34h	More data offset 10h	Description	Suggested action
4002xxxx	yyyy00zz	Host interface error: xxxx = mailbox1; yyyy = mailbox2; zz = command	Hardware DMA error: replace adapter
4005xxxx	Yyyy00zz	Mailbox command error: xxxx = mailbox1; yyyy = mailbox2; zz = command	Normally indicates loop down, check all cabling
4005xx6F	yyyyyyzz	Login Fabric port mailbox command error: xx = adapter; state yyyyyy = port id; zz = loop id	Normally indicates loop down, check all cabling
* 80010000	00000000	Reset detected	Not logged during normal operation
8003xxxx	yyyyzzzz	RISC request queue transfer error: xxxx = mailbox1; yyyy = mailbox2; zzzz = mailbox3	Hardware error: replace adapter
8004xxxx	yyyyzzzz	RISC response queue transfer error: xxxx = mailbox1; yyyy = mailbox2; zzzz = mailbox3	Hardware error: replace adapter
* 80100000	0000xxxx	LIP occurred: xxxx = mailbox1	Not logged during normal operation
* 80110000	xxxxyyzz	Link up 2200: xxxx = current ISP connection mode (0 = Loop, 1 = P2P); yy = ISP connection option 0 = Loop, 1 = P2P, 2 = Loop->P2P, 3 = P2P->Loop; zz = starting loop ID for remote devices. 2100: xxxx = 0000; yyyy = 0000	Not logged during normal operation
80120000	00000000	Link down error	Not logged during normal operation
80130000	0000xxxx	LIP reset occurred: xxxx = mailbox1	Not logged during normal operation
**80300000	xxxxyyzz	Link mode up: xxxx = current ISP connection mode 0 = Loop 1 = P2P; yy = ISP connection option (0 = Loop, 1 = P2P 2 = Loop->P2P 3 = P2P->Loop); zz = starting loop ID for remote devices	Not logged during normal operation
**8036aabb	xxxxyyzz	Point-to-Point update configuration: xxxx = mailbox1; yy = current ISP connection mode (0 = Loop, 1 = P2P); zz = ISP connection option 0 = Loop, 1 = P2P, 2 = Loop->P2P, 3 = P2P->Loop; aa = starting loop ID value for remote devices; bb = current retry count for the ISP initialization mode	Not logged during normal operation
* F0000000	00000000	Restarting RISC firmware	Initial driver load or loop down longer than 4 minutes
* F0030004	00xx00yy	Reset command completion error: xx = CDB opcode; yy = target loop ID	Not logged during normal operation
* F0030005	00xx00yy	Command aborted by OS: xx = CDB opcode; yy = target loop ID	Not logged during normal operation
F0030028	00xx00yy	Port unavailable, command completion error: xx = CDB; opcode yy = target loop ID	Check target device and cabling
F0030029	00xx00yy	Port logged out command completion error: xx = CDB; opcode yy = target loop ID	Check target device and cabling
F003001C	00xx00yy	Target device queue full (SCSI status 28 from target): xx = CDB opcode; yy = target loop ID	Check target device and cabling

Table 4. Fibre Channel adapter error codes (continued)

Event code offset 34h	More data offset 10h	Description	Suggested action
* F00A0000	0000xxxx	RISC firmware state during adapter initialization: xxxx = firmware state	Not logged during normal operation
F00B0000	00000000	Reset ISP chip failed	
F00D0000	00000000	Fail to allocate noncached memory	
F00E0000	00000000	Fail to map ISP registers	
F00F0000	00000000	Fail to load RISC code	
F0100000	0000xxxx	Fail to start RISC code: xxxx = mailbox0	
F0110000	0000xxxx	Fail to initialize firmware xxxx = mailbox0	
F0120000	0000xxxx	Fail to get firmware state: xxxx = mailbox0	
* F0130000	00000000	Port Update notification (RISC database changed)	
* F0140000	xxxxxxxx	RSCN notification (Name server change detected): xxxx = RSCN Information	
* F0150000	00xx00yy	Name server query rejected (v6 2100): xx = Reason Code; yy = Explanation Code (Valid if reason code is 0x09)	
* F0150000	xxxxyyzz	Name server query rejected (v7 2100/2200): xxxx = response status; yy = Reason Code; zz = Explanation Code (Valid if reason code is 0x09, for example, if zz = 0x09, yy = 07, this means no SCSI device found.)	
* F0160000	00000000	Driver reset called; command timed out	
* F0170000	00xxxxxx	Fabric port login (for information only): xxxxxx = Port Id	
F0180000	000000xx	Excessive link errors, loop down: xx = number of link errors per second	
* F0190000	00000000	Verify firmware checksum failure	
* F01B0000	000000xx	Device marked offline after being not-ready longer than port down retry count: xx = loop ID of device	
* F01C0000	000000xx	Bad type field in IOCB from RISC: xx = IOCB type	
* F01D0000	00000000	Error downloading post RISC code	
* F01Exxxx	Yyyyzzzz	Error running post RISC code: xxxx = mailbox0; Yyyy = mailbox1; zzzz = mailbox2	
* F01Fxyyy	Zzzzzzzz	DMA 64 bit (PAE) configuration (for information only): xx = Dma64BitAddressess flag set by W2K; yy = Dma64BitAddressess flag set by driver; zzzzzzzz = driver adapter flags	
F0200000	Xxxxyyyy	Error ISP not accessible: xxxx = ISP host command and control; yyyy = ISP interrupt status	



Table 4. Fibre Channel adapter error codes (continued)

Event code offset 34h	More data offset 10h	Description	Suggested action
* F0210000	xxyy00zz	ISP connection option/topology (for information only): xx = ISP connection option from NVRAM; yy = previous ISP topology; zz = current ISP topology code: 0000 = Loop, 0001 = FL_Port, 0002 = N_Port to N_Port, 0003 = F_Port	
* F0220000	0000xxxx	External RISC ram parity error (for 2200G only): xxxx = number of parity errors detected	
* F0230000	Xxxxyyyy	Subvendor ID not match (for information only): xxxx = actual subvendor ID; yyyy = expected subvendor ID	

## Persistent Storage Manager event log messages

If you experience problems while using the Persistent Storage Manager to create, schedule, or delete persistent images, or while using the NAS Backup Assistant or IBMSNAP.EXE to perform a Persistent Image backup, use the Table 5 to troubleshoot any problems. Each of these messages are logged to the system event log by the PSMAN5 driver (file system driver for Persistent Storage Manager (PSM)); each entry appears with “psman5” as the source name.

For more information about Persistent Storage Manager and persistent images, see the *User's Reference*.

Table 5. Persistent Storage Manager event log messages

Error Code	Description	Action
0x00000001	An invalid IOCTL was sent to the driver.	Contact IBM technical support.
0x00000002	Device name is not recognized by PSM.	Contact IBM technical support.
0x00000003	An invalid path was given for the cache file. This error will appear if the cache file cannot be created because the cache file drive is not present.	Contact IBM technical support.
0x00000005	An exception occurred.	Contact IBM technical support.
0x00000005	You do not have sufficient rights to the cache file directory.	Contact IBM technical support.
0x00000005	The cache file specified is a directory instead of a file.	Contact IBM technical support.
0x00000005	PSM was told to shut down.	Contact IBM technical support.
0x00000006	User performing PSM function without opening PSM.	Contact IBM technical support.
0x00000015	Access to a virtual volume has been attempted after the virtual volume has been destroyed.	Do not access virtual volumes after they have been destroyed.
0x00000016	Something has gone wrong with PSM.	Contact IBM technical support.
0x00000017	Bad sector was detected in the cache file.	Contact IBM technical support.
0x0000001F	General failure.	Contact IBM technical support.
0x00000057	An invalid parameter was passed to a function.	Contact IBM technical support.

Table 5. Persistent Storage Manager event log messages (continued)

Error Code	Description	Action
0x00000079	I/O timed out while reading from the cache file.	Contact IBM technical support.
0x0000007A	Buffer size supplied is insufficient to hold requested information.	Contact IBM technical support.
0x000000A1	An invalid path was given for the cache file.	Contact IBM technical support.
0x000000EA	Buffer size supplied is insufficient to hold requested information.	Contact IBM technical support.
0x000003E6	An exception occurred.	Contact IBM technical support.
0x00000456	PSM was stopped because the media of a device was changed on which PSM was running.	Contact IBM technical support.
0x0000045D	An error occurred on the device.	Contact IBM technical support.
0x000005AA	There is insufficient memory available.	Contact IBM technical support.
0x000006F8	Buffer size supplied is insufficient to hold requested information.	Contact IBM technical support.
0x000006F8	Invalid buffer address passed for I/O.	Contact IBM technical support.
0x80000005	Specified buffer size is too low.	Contact IBM technical support.
0x8000001C	PSM was stopped because the media of a device was changed on which PSM was running.	Take a new persistent image.
0xA0000004	<p>The cache file is &lt;x&gt;% full. The oldest persistent images will automatically be deleted at &lt;y&gt;%.</p> <p>This is a warning that the cache file size is approaching the threshold at which some persistent images will be deleted automatically to free up some cache file capacity. &lt;x&gt; is the percentage for which the warning message will be generated, and &lt;y&gt; is the percentage that represents the threshold. (By default, these values are 80% and 90%, respectively, and can be modified in Windows 2000 for NAS (Disks/Persistent Storage Manager).)</p>	In Windows 2000 for NAS (Disks/Persistent Storage Manager), delete some (noncritical) persistent images before the system does to guarantee that critical persistent images do not get deleted accidentally.
0xC0000001	General failure.	Contact IBM technical support.
0xC0000002	Function is not yet implemented.	Contact IBM technical support.
0xC0000005	An Access Exception occurred.	Contact IBM technical support.
0xC0000008	User performing PSM function without opening PSM.	Contact IBM technical support.
0xC000000D	An invalid parameter was passed to a function.	Contact IBM technical support.
0xC000000E	Device name is not recognized by PSM.	Contact IBM technical support.
0xC0000010	An invalid IOCTL was sent to the driver.	Contact IBM technical support.
0xC0000013	Access to a virtual volume has been attempted after it has been destroyed.	Contact IBM technical support.
0xC000001C	An invalid IOCTL was sent to the driver.	Contact IBM technical support.
0xC0000022	An access exception occurred.	Contact IBM technical support.

Table 5. Persistent Storage Manager event log messages (continued)

Error Code	Description	Action
0xC0000022	You do not have sufficient rights to the cache file directory.	Contact IBM technical support.
0xC0000023	Specified buffer size is too small.	Contact IBM technical support.
0xC0000034	Cache file name is invalid.	Contact IBM technical support.
0xC000003A	An invalid path was given for the cache file.	Contact IBM technical support.
0xC000003B	An invalid path was given for the cache file.	Contact IBM technical support.
0xC000003E	Bad sector was detected in the cache file.	Contact IBM technical support.
0xC0000043	A file cannot be opened because the share access flags are incompatible.	This occurs when the very last persistent image is deleted. PSM initializes its files when the last persistent image is deleted. While it is initializing, a new persistent images can not be created. Try again in a few minutes.
0xC000009A	There is insufficient memory available.	Contact IBM technical support.
0xC00000B5	I/O timed out while reading from the cache file.	Contact IBM technical support.
0xC00000BA	The cache location must be a file rather than a directory.	Contact IBM technical support.
0xC00000E8	Invalid buffer address passed for I/O.	Contact IBM technical support.
0xC000010A	PSM was told to shut down.	Contact IBM technical support.
0xC0000184	Something has gone wrong with PSM.	Contact IBM technical support.
0xC0000185	An error occurred on the device.	Contact IBM technical support.
0xC0000206	Buffer size supplied is insufficient to hold requested information.	Contact IBM technical support.
0xE0001001	PSM could not start due to the server being constantly busy for <x> minutes.	Take a persistent image when NAS appliance demands are lower.
0xE0001002	PSM detected a deadlock.	Contact IBM technical support.
0xE0001003	Specified volume not active or deleted.	Do not delete volumes with active persistent images.
0xE0001004	PSM was specified for a volume on which PSM is not running.	Contact IBM technical support.
0xE0001005	Cache file overflow caused all existing persistent images to be deleted.	Increase the cache file size in Windows 2000 for NAS (Disks/Persistent Storage Manager), or take or schedule persistent images when fewer users are online.
0xE0001006	The application tried to enable PSM without first calling PSM_Register.	Contact IBM technical support.
0xE0001007	Invalid license code.	Contact IBM technical support.
0xE0001008	Another application already has PSMD locked exclusively.	Contact IBM technical support.
0xE0001009	PSM needs to be locked exclusive for this function to work.	Contact IBM technical support.
0xE000100A	Wrong version of the driver has been loaded on this system.	Contact IBM technical support.

Table 5. Persistent Storage Manager event log messages (continued)

Error Code	Description	Action
0xE000100B	A reboot is required before PSM can operate.	Reboot the appliance, and try taking a persistent image again. If this still fails, contact IBM technical support.
0xE000100C	PSM is not installed.	Contact IBM technical support.
0xE000100D	An incompatible DLL from another version of PSM is already loaded.	Contact IBM technical support.
0xE000100E	Out of memory.	Contact IBM technical support.
0xE000100F	Invalid parameter.	Contact IBM technical support.
0xE0001010	Invalid handle.	Contact IBM technical support.
0xE0001011	Not implemented yet.	Contact IBM technical support.
0xE0001012	Object type is not expected object.	Contact IBM technical support.
0xE0001013	User buffer is not large enough.	Contact IBM technical support.
0xE0001014	Out of available structures.	In Windows 2000 for NAS (Disks/Persistent Storage Manager), delete some persistent images.
0xE0001015	PSM is shutting down.	Contact IBM technical support.
0xE0001016	The device, volume or object does not exist.	Contact IBM technical support.
0xE0001017	Unsuccessful.	Contact IBM technical support.
0xE0001018	The device does not have any media loaded.	Contact IBM technical support.
0xE0001019	Object already exists.	Contact IBM technical support.
0xE000101A	Specified path is a directory and not a file.	Contact IBM technical support.
0xE000101B	Invalid path was specified.	Contact IBM technical support.
0xE000101C	The static volume was not mounted.	Look at the system event log for a warning message (from the PSMAN5 service) whose code should appear in this list. The action depends on the message.
0xE000101D	The static volume had errors during mount.	Look at the system event log for a warning message (from the PSMAN5 service) whose code should appear in this list. The action depends on the message.
0xE000101E	The static volume could not be found.	Contact IBM technical support.
0xE000101F	The volume the cache file resides on is out of space.	The cache file for each volume resides on the volume itself. Free some space on the volume.
0xE0001020	The volume the cache file resides on was dismounted.	The cache file for each volume resides on the volume itself. Do not dismount the volume.
0xE0001021	The server was shut down.	Do not shut down the IBM TotalStorage NAS appliance while persistent images are in progress.
0xE0001022	Unable to create cache file.	Contact IBM technical support.
0xE0001023	PSM recovery could not find a persistent image entry.  A persistent image was lost during the recovery process. It is unknown which persistent image it was.	Contact IBM technical support.

Table 5. Persistent Storage Manager event log messages (continued)

Error Code	Description	Action
0xE0001024	PSM recovery could not open the index file. All persistent images are corrupt.	Contact IBM technical support.
0xE0001025	PSM recovery encountered error <x> inserting key (<y>:<z>) into dictionary.  <x> is the error that occurred and can be found in this list of errors.	Look up the error in this list and take the specified action.
0xE0001026	PSM recovery encountered corrupt index sector %2.  An index entry was found to be corrupt during the last boot.	Contact IBM technical support.
0xE0001027	A persistent image could not be created due to error 0x<x>.  <x> is the error that occurred.	Look up the error in this list and take the specified action.
0xE0001028	The cache file is <x>% full. Persistent images have been deleted.  The oldest persistent images have been deleted.	In Windows 2000 for NAS (Disks/Persistent Storage Manager), delete persistent images to make sure specific (critical) persistent images are not destroyed by mistake.
0xE0001029	The maximum (<x>) allowed persistent images has been reached. A persistent image was not created.  PSM cannot create any more persistent images because the configured maximum number of persistent images that PSM can keep concurrently has been reached.	In Windows 2000 for NAS (Disks/Persistent Storage Manager) increase the number of persistent images allowed, or edit the schedules to not make so many persistent images.

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