

IBM TotalStorage™ Network Attached Storage 300
Model 326



Release Notes

For Release 2.5 Preload

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Release notes

This document contains the release notes for the IBM 5195 TotalStorage Network Attached Storage 300, Model 326.

Refer to www.ibm.com/storage/support/nas for possible updates to these release notes and for copies of the base documents.

Fixes and enhancements in this release

Your Model 326 comes with a preloaded set of software (described in detail in the *User's Reference*). As the preloaded software is updated with newer software components (containing problem fixes, functional enhancements, or both), the changes are applied in product manufacturing before the product is shipped to you. For this reason, the exact release of preloaded software on your Model 326 might vary, depending on when you received your Model 326.

To identify the exact release of preloaded software, from the Model 326 desktop (using Terminal Services or direct-attached keyboard and monitor), click **IBM NAS Admin**, and then on the left pane select **Software Version**. The first line of text that appears on the right pane provides the software release (version and build number).

The original level of Model 326 software is Version 2.0. The following sections describe fixes and enhancements to newer levels of software, in reverse chronological order. If you have an older version of Model 326 software and require fixes or enhancements that are provided in newer versions, go to <http://www.ibm.com/storage/support/nas> for information on obtaining those fixes and enhancements. They might be provided in code packages that you must download and install, in technical tips informing you of software configuration changes (applied by IBM to later versions of Model 326 software preloads) that you must apply, or as CDs for which you must contact IBM technical support to obtain and install.

Fixes and enhancements in Version 2.5

Updated hardware drivers

The hardware drivers have been updated to newer versions.

Storage Manager for SAK Version 2.0

Release 2.5 includes Storage Manager for SAK Version 2.0, a storage management tool that includes the following functions:

- Storage reports
- Directory quotas
- File screening

Storage reports address disk usage, wasted storage space, file ownership, security, and administration. Reports can run interactively, scheduled on a regular basis, or run as part of a storage resource-management policy when disk space utilization reaches a critical level.

Directory quotas allow the administrator to add, delete, monitor, and change disk space limits for selected directories on the NAS appliance. Directory quotas provide disk space monitoring and control in real time and supports active and passive limits with two real-time space alarms.

File screening allows the blocking of any file type such as MP3, graphics files, VBS viruses, and executables from writing to the NAS appliance.

Updated IBM ServeRAID Storage Manager

IBM ServeRAID™ Storage Manager has been updated to Version 4.84.

Tivoli Storage Manager LAN Free Support

Support for Tivoli® Storage Manager LAN Free Support has been added.

Uninterruptible power supply support

Release 2.5 includes support for uninterrupted power supplies (UPS). UPS devices provide emergency backup power for a specific period of time when the local power fails. This power comes from batteries housed within the UPS. High-performance surge suppression helps protect your appliance from electrical noise and damaging power surges. During a power failure, the UPS is designed to instantly switch your appliance to emergency battery-backup power. After you have installed a UPS 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 UPS service works on your appliance. The available UPS settings depend on the specific UPS hardware installed on your system. Before you use your UPS device, type the following information on the UPS Configuration page:

- UPS device manufacturer
- UPS device model
- The serial port to which the UPS device is connected

To configure the UPS service, click **UPS** on the Maintenance page.

To help protect your server appliance from power failures, test it by simulating a power failure by disconnecting the main power supply from the UPS device. Do **not** perform this test during production use. Your appliance and peripherals connected to the UPS device should remain operational, messages should be displayed, and events should be logged. Wait until the UPS battery reaches a low level to ensure a proper shutdown occurs. Restore the main power to the UPS 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 UPS service start failures and appliance shutdown initiations. Critical events might change the status of the appliance.

Enhanced NFS performance through Services for UNIX (SFU V2.2 + QFE)

Services for UNIX® V2.2 + QFE provides increased performance for NFS V2.0.

Updated IBM FAStT Storage Manager

IBM FAStT Storage Manager has been updated to Version 8.20.

Persistent Storage Manager problem fixes

Persistent Storage Manager (PSM) has been updated to Version 2.2 build 2222.1. This level contains fixes for the following problems in PSM Version 2.2 build 2216.3.

Deleted persistent images might reappear after failover or reboot

Under certain conditions a persistent image that had been deleted might reappear, although the deletion appeared to be successful at the time that it was performed (the image does not appear on the PSM Persistent Images page and is not accessible on the volume). A deleted persistent image could reappear under either of the following conditions:

- The volume on which the persistent image was created is failed over between nodes.
- The system is restarted.

Deletion of a persistent image does not immediately free up cache space

The PSM cache usage for a particular volume does not immediately decrease when a persistent image on that volume is deleted. The corresponding decrease occurs on the next persistent image deletion on that volume. Also, during system startup, the cache usage might increase.

In PSM Version 2.2 build 2222.1, the persistent image is deleted immediately and all of its associated cache space is immediately freed up.

Under heavy write activity, writes might freeze while Volume Settings page is being loaded

If there is heavy write activity to one or more volumes on the NAS appliance and the PSM Volume Settings page is requested (in the Windows[®] 2000 for NAS GUI, either on the local console or using a Web browser over the network), then all write activity might freeze for up to 90 seconds while the page is being loaded.

NAS Setup Navigator

Version 2.5 of the Model 326 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.

Tivoli Storage Manager

Tivoli Storage Manager (TSM) 4.2.2 server, client, and agent are included on the Supplementary CD. The client and agent are also available on the Web at:

www.ibm.com/storage/support/nas

Functional notes

The following sections contain functional information.

Updated information on joining a node to a domain (in cluster setup)

The following information replaces the information in the section titled “Joining a node to a domain” in Chapter 5 of the *User’s Reference*. This information is also included in the NAS Setup Navigator (described in “Fixes and enhancements in Version 2.5” on page 1).

For the Windows Cluster service to form a cluster on a given node, the service must authenticate with a Windows domain. If a Windows domain controller is available on a public network to which both nodes will be physically connected, follow the instructions in “Joining a node to a domain”. Otherwise, follow the instructions in “Creating an Active Directory domain” to create a new domain that will encompass just the cluster itself.

Joining a node to a domain

All nodes in the cluster must be members of the same domain and be able to access a Primary Domain Controller (PDC) and a DNS Server.

Note: The administrator must have a valid domain account on the PDC.

1. Right-click **My Computer**, and click **Properties**.
2. Click **Network Identification**. The System Properties dialog box displays the full computer name and workgroup or domain.
3. Click **Properties** and perform these steps to join a domain:
 - a. Select the **Domain** radio button.
 - b. Type the name of your domain and click **OK**.
 - c. When prompted, enter the Administrator user ID and password and click **OK**.
4. Close the **System Properties** window.
5. Restart the node, and proceed with “Cluster setup.”

After the computer restarts, it is recommended that you do not log in to the domain. If you do, you will see the Windows 2000 Configure Your Server window. Click the **I will configure this server later** radio button, and then click **Next**. On the next window, clear the *Show this screen at startup* check box and click **Finish**.

Creating an Active Directory domain

The Windows 2000 Cluster service runs in the context of a Windows-based domain security policy, typically created specifically for the Cluster service to use. For the Cluster service to form a cluster on a given node, the service must first authenticate itself using the credentials of this policy. A domain controller must be available for the domain that issued the policy for authentication to occur. If the Cluster service does not have access to a domain controller, it cannot form a cluster.

Note: For Active Directory to function properly, DNS servers must provide support for Service Location (SRV) resource records described in RFC 2052, *A DNS RR for specifying the location of services (DNS SRV)*. SRV resource records map the name of a service to the name of a server offering that service. Active Directory clients and domain controllers use SRV records to determine the IP addresses of domain controllers. Although not a technical requirement of Active Directory, it is highly recommended that DNS servers provide support for DNS dynamic updates described in RFC 2136, *Observations on the use of Components of the Class A Address Space within the Internet*.

The Windows 2000 DNS service provides support for both SRV records and dynamic updates. If a non-Windows 2000 DNS server is being used, verify that it at least supports the SRV resource record. If not, it must be upgraded to a version that does support the use of the SRV resource record. A DNS server that supports SRV records but does not support dynamic updates must be updated with the contents of the Netlogon.dns file created by the Active Directory Installation wizard while promoting a Windows 2000 Server to a domain controller.

By default, the Active Directory Installation wizard attempts to locate an authoritative DNS server for the domain being configured from its list of configured DNS servers that will accept a dynamic update of an SRV resource record. If found, all the appropriate records for the domain controller are automatically registered with the DNS server after the domain controller is restarted.

If a DNS server that can accept dynamic updates is not found, either because the DNS server does not support dynamic updates or because dynamic updates are not enabled for the domain, the following steps are taken to ensure that the installation process is completed with the necessary registration of the SRV resource records:

1. The DNS service is installed on the domain controller and is automatically configured with a zone based on the Active Directory domain.

For example, if the Active Directory domain that you chose for your first domain in the forest was example.microsoft.com, a zone rooted at the DNS domain name of example.microsoft.com is added and configured to use the DNS service on the new domain controller.

2. A text file containing the appropriate DNS resource records for the domain controller is created.

The file called Netlogon.dns is created in the %systemroot%\System32\config folder and contains all the records needed to register the resource records of the domain controller. Netlogon.dns is used by the Windows 2000 NetLogon service and to support Active Directory for non-Windows 2000 DNS servers.

If you are using a DNS server that supports the SRV resource record but does not support dynamic updates (such as a UNIX-based DNS server or a Windows NT Server 4.0 DNS server), you can import the records in Netlogon.dns into the appropriate primary zone file to manually configure the primary zone on that server to support Active Directory.

If you are configuring the first node, complete these steps to create the Active Directory Domain Controller:

1. Start the Active Directory Installation wizard from the IBM NAS Admin console by selecting **Local Domain Controller Setup** in the Cluster Tools folder.
2. Read the first page and click **Next**.
3. On the Domain Controller Type page, select **Domain controller for a new domain**, then click **Next**.
4. On the Create Tree or Child Domain page, select **Create a new domain tree**, then click **Next**.
5. On the Create or Join Forest page, select **Create a new forest of domain trees**, then click **Next**.
6. On the New Domain Name page, type the full DNS name for the new domain. Write down this value now; it will be needed later on. Click **Next**.
7. On the NetBIOS Domain Name page, click **Next**.

8. On the Database and Log Locations page, click **Next** to accept the default values.
9. On the Shared System Volume page, click **Next** to accept the default value.
10. On the Permissions page, select **Permissions compatible only with Windows 2000 servers**, then click **Next**.
11. On the Directory Services Restore Mode Administrator password, type your password. Write down this value now; it will be needed later on. Click **Next**.
12. On the Summary page, review the values, click **Next** and wait for the Configuring Active Directory process to complete.
13. On the Active Directory Installation Wizard page, click **Finish**. If prompted, defer the system reboot.
14. Restart the node.

If you are configuring the joining node, perform these tasks to join this node to the existing Active Directory Domain Controller (previously created on the first node):

1. Start the Active Directory Installation Wizard from the IBM NAS Admin console by selecting **Local Domain Controller Setup** in the Cluster Tools folder.
2. Read the first page and click **Next**.
3. On the Domain Controller Type page, select **Additional domain controller for an existing domain**, then click **Next**.
4. On the Network Credentials page, type the user name (Administrator), password, and domain name (enter the Active Directory Domain name created on the other node), then click **Next**.
5. On the Additional Domain Controller page, type the full DNS name of the existing domain, then click **Next**.
6. On the Database and Log Locations page, click **Next** to accept the default values.
7. On the Shared System Volume page, click **Next** to accept the default value.
8. On the Directory Services Restore Mode Administrator password page, type your password. Write down this value now; it will be needed later on. Click **Next**.
9. On the Summary page, review the values, then click **Next**. Wait for the Configuring Active Directory process to complete.
10. On the Active Directory Installation Wizard page, click **Finish**. If prompted, reboot the system now.

Additional information on IBM Director

Real Time Diagnostics and Electronic Service Agent not available

The Real Time Diagnostics function and Electronic Service Agent™ (eSA) features of IBM Director are not available in this release of the Model 326. Disregard the information presented on these two functions in Chapter 6 of the *User's Reference*.

Rack Manager enhancements

This information is a clarification of the information in the section titled "Rack Manager and inventory enhancements" in Chapter 6 of the *User's Reference*.

The Rack Manager Task enhancements to recognize IBM NAS components are part of the IBM Director Server Service Pack Version 3.1.1. To use this feature, the IBM Director Service Pack 3.1.1 must be loaded on the IBM Director server.

Best Practices does not display results when default location of output is changed

Storage reports address disk usage, wasted space, file ownership, security, and administration. Reports can run interactively, be scheduled on a regular basis, or run as part of a storage resource-management policy when disk space utilization reaches a critical level. The Best Practices report is a representation of storage-management best practices that are a good starting point for disk space analysis. The Best Practices reports give an overall indication of your system's storage health. The report identifies file types, duplicate files, files that are not backed up, the most commonly-used files, and nightly backup capacity requirements. Several options are available when creating the reports, such as the format of the report and output location. If you choose to store the output somewhere other than the default location, the report will not display automatically; however, the report is still generated and can be displayed when accessed.

Error 508 after using the Recovery CD Set

When an image is built on a nonmirrored system and is recovered on a RAID mirrored system, Error 508 might occur. This error also occurs when an image is restored to any hard drive configuration that is different from the configuration where the image was created (for example, moving from 36.4-GB to 73.4-GB drives or a different ServeRAID controller). Error 508 occurs after the recovery process and before Windows Powered starts. The text of the error message is as follows:

As specified, the operation does not change the partition

The error message appears when the requested partition size is aligned with a cylinder boundary that is the same cylinder boundary as the existing partition size.

Note: This message is informational only and does not require action.

UPS service error

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

To configure and enable the UPS service using the Windows 2000 for NAS GUI:

1. Click **Maintenance** → **UPS**.
2. Select the manufacturer, model, and COM port that your UPS is attached to.
3. Select the **Enable the UPS service on this appliance** check box and click **OK**.

Note: Do *not* enable the UPS service unless you have a UPS attached to your appliance.

Fibre Channel adapter device driver not updating properly

When you check the version level of the device driver for the Fibre Channel Host Bus Adapter, it might appear to be an incorrect version. The proper way to verify the version level is to perform the following steps:

1. Right-click **My Computer** and select **Properties**.
2. Under the Hardware tab, click **Device Manager**.
3. Expand SCSI and RAID Controllers.
4. Right-click **QLA2200 PCI Fibre Channel Adapters** and select **Properties**.
5. Under the Driver tab, click **Driver Details**. The correct version should be 8.1.4.60 (W2K IP).

This problem occurs when Windows Powered does not update the associated OEM.INF file. This does not affect the function of the driver. The procedure above should be used to determine the correct version of the driver when calling IBM Support.

Error when trying to disable port A on Alacritech 10/100 Quad-Port Ethernet adapter

If you attempt to disable port A on the Alacritech 10/100 Quad-Port Ethernet adapter by right-clicking **My Network Places** on the desktop, then right-clicking **Alacritech Port A**, the following message appears:

It is not possible to disconnect at this time. This connection may be using one or more protocols that do not support Plug-and-Play, or it may have been initiated by another user or the system account.

Click **OK**. There will be no indication that the port has been disabled. You must reboot the appliance before the port will be disabled.

Alacritech adapter not prompting to reboot after deleting adapter team

Although you are not prompted to reboot the appliance after you delete an adapter team on the Alacritech 10/100 Quad-Port Ethernet adapter, you must reboot the appliance at this time.

You will see an indication that a reboot is needed by performing the following steps:

1. Right-click **My Network Places** and select **Properties**.
2. Right-click **Port A of Alacritech Adapter** and select **Properties**.
3. Click **Configure** and the Properties page appears. A message indicating a reboot is necessary is under Device Status.
4. Click **OK**. A message that a reboot is now needed appears.

Windows 2000 for NAS GUI tabs not working correctly

If you connect remotely to the NAS appliance through port 8099 using the fully qualified IP address, you might see the following message if you click on a link that launches Terminal Services:

Cannot access this program in the current browser zone.

There are two ways to resolve this problem:

- In the browser address field, use the hostname of the NAS appliance you are connecting to (for example, <http://IBM5194-23A1055:8099>).
- From Internet Explorer, select **Tools** → **Internet Options** → **Security** → **Trusted Sites** → **Sites**. Clear the **Require server verification (https:) for all sites in this zone** check box and add the fully qualified IP address of the NAS appliance.

Japanese text not displaying correctly in NAS Setup Navigator

If you change the language in the Windows 2000 for NAS GUI to Japanese, some of the characters in the NAS Setup Navigator might not display correctly. You can correct this problem by performing the following steps:

1. Open Internet Explorer.
2. Go to **View** → **Encoding**.
3. Ensure that **Auto-Select** is *not* selected.
4. Ensure that **Shift-JIS** is selected.

File and Print Services for NetWare error

When installing or configuring the Services for NetWare 5 software on the NAS appliance, the following errors might appear in the event log:

Event Type: Error

Event Source: FPNWSRV

Event ID: 2011

Description: The server's configuration parameter "irpstacksize" is too small for the server to use a local device. Please increase the value of this parameter.

To download a fix for this problem, go to the IBM support Web site at www.ibm.com/storage/support/nas and click **Network Attached Storage (NAS)** under Technical Support.

FASTt controller might go offline when a failure occurs

If the ISL cable connecting the two Fibre Channel hubs fails in a clustered configuration, one of the FASTt controllers will go into offline state. This is the expected behavior for this configuration. In this situation, the FASTt controller has not failed and does not need to be replaced. If you find an offline FASTt controller, check the ISL cable before continuing on to diagnostic procedures for the controller.

Microsoft DTC service error message

You might receive an error message in your event log similar to the following:

```
MS DTC has determined that the cluster service is installed
but not running when MS DTC was started. MS DTC will continue
to startup but it will not failover. Additionally, if the
cluster service is started then please shut down this instance
of MS DTC as it will become unusable.
```

If you receive this error message, stop and restart the service mentioned in the message. This can occur with any service that needs to be switched to the other node if the current node fails.

Cluster configuration considerations for the Cluster Group

When you create the cluster between the two nodes of the Model 326, a default group named Cluster Group is created. This group contains the following resources, related to cluster administration:

- The cluster Quorum disk
- The IP address you defined for the cluster
- The cluster name

Do not add other resources to this group; this might hinder your ability to administer the cluster. Also, failure of any additional resources within the Cluster Group might trigger failover or inability to successfully administer the cluster.

You do not need to consider the Cluster Group in the load balancing scheme, as the group is for cluster administration only. You can balance the other resources on the two nodes independently of the Cluster Group.

Administration notes

This section contains administration information.

Updated information on Supplementary CDs

This information replaces the information in the section titled “Using the Supplementary CD” in Chapter 9 of the *User’s Reference*.

The Supplementary CDs contain documentation and copies of key software applications that are preinstalled on the Model 326. Table 1 and Table 2 include the names of the directories found on the Supplementary CDs and a description of the contents of the directory.

Table 1. Supplementary CD 1 directories

Directory name	Contents
DB2	<ul style="list-style-type: none">• EnableDB2Support.exe• DisableDB2Support.exe <p>These files enable and disable support for Linux- and Solaris-based DB2[®] clients using NFS shares.</p>
DiskImages	<p>Contains diskette image for the Recovery Enablement Diskette and a diskette image for a bootable diskette that automatically configures the ServeRAID controller and drives.</p> <p>To create the Recovery Enablement Diskette, run enablement_diskette25.exe and insert a 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_2.5.EXE and insert a HD 1.44 floppy diskette into drive A: when prompted.</p>
diskpart Samples	<p>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.</p>
IBM Advanced Appliance Configuration	<p>Run Setup.exe on the machine from which you will administer the appliance. The agent is pre-installed on the appliance.</p>
IBM NAS Extensions For IBM Director	<p>The IBM NAS extensions to IBM Director provide capabilities to IBM Director that are specific to the IBM NAS appliances.</p>
Zip Tools	<p>Contains compression tools used for sending information to IBM technical support.</p>
readme.txt	<p>This is a text file that describes the contents of the Supplementary CDs.</p>

Table 2. Supplementary CD 2 directories

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

OpenHCD USB controller warning

Any warning (Yellow Explanation) indication in Device Manager, under Universal Serial Bus Controller, Standard OpenHCD HSB Host Controller, should be ignored.

The warning is an indication that the device cannot find enough free resources and does **not** affect product function or performance.

Attention: The USB controller is **not** supported in this appliance.

5191 RAID Storage Controller event logs

The 5191 RAID Storage Controller event log lists errors and failures that occur. To view this log, click **Start** → **Programs** → **Event Viewer**. Table 3 lists the most common events.

Table 3. Common 5191 RAID Storage Controller events

Event	Label identifier	Description
3	IO_ERR_CONFIGURATION_ERROR	
4	IO_ERR_LAYERED_FAILURE	Driver beneath this layer failed.
18	IO_ERR_DRIVER_ERROR	Driver detect internal data structure error.

Event 18 indicates that components along the path from the host bus adapter to the controller might be generating errors. These components include the host bus adapter, Fibre Channel cable, GBIC, hub, and so on.

If multiple occurrences of event 18 occur, the earliest log entry is probably associated with the original failure. Later entries of event 18 on other nodes are most likely responses to the original failure. They also usually contain an SRB status of 0x0a, SCSI selection timeout. You must check the system's date and time stamp for synchronization to verify which entry has the earliest time (and is therefore indicating the original failure).

The following example demonstrates an error message produced by RDAC during normal execution. This information can be obtained by selecting an event's properties and viewing the raw data as Words:

```
Event Type: Error
Event Source: Rdacfltr
Event Category: None
Event ID: 4
Date: 9/15/2000
Time: 11:41:40 AM
User: N/A
Computer: ICTTOP1
Description:
Driver detected an internal error in its data structures for
\Device\Rdac\ICTTOP_001\B\P2P0I5\5.
Data:
0000: 00180000 006e0001 00000000 c0040004
0010: 00000125 00000000 00000000 00000000
0020: 00000000 00000000 00020005 00000004
0030: 00000000 00000025 00000a00 00000000
```

A breakdown of the data is shown in Table 4.

Table 4. Breakdown of data from example

0018 0000 006e 0001 0000 0000 c004 0004		
	0018	DumpDataSize
	00	RetryCount
	00	MajorFunctionCode

Table 4. Breakdown of data from example (continued)

	006e	StringOffset
	0001	NumberOfStrings
	0000	<i>Byte Boundry Padding</i>
	0000	EventCategory
	C004 0004	ErrorCode
0000 0125 0000 0000 0000 0000 0000 0000		
	0000 0125	UniqueErrorValue
	0000 0000	FinalStatus
	0000 0000	SequenceNumber
	0000 0000	IoControlCode
0000 0000 0000 0000		
	0000 0000 0000 0000	DeviceOffset
0200 0505 0000 0004 0000 0000 0000 0025 0000 0a00 0000 0000		DumpData
<i>DumpData[0]</i>	0002	Port
	0005	Path
<i>DumpData[1]</i>	0000 0004	ID
<i>DumpData[2]</i>	0000 0000	LUN
<i>DumpData[3]</i>	0000 0025	Command (from the CDB)
<i>DumpData[4]</i>	0000 0a00	<i>xx</i> – SRB status
	<i>xxyy</i>	<i>yy</i> – SCSI status
<i>DumpData[5]</i>	0000 0000	<i>aa</i> – ASCQ
	<i>aabb ccdd</i>	<i>bb</i> – ASC
		<i>cc</i> – Sense Key
		<i>dd</i> – FRU

Table 5 summarizes the values found in the UniqueErrorValue field and are produced by RDAC during normal execution.

Table 5. UniqueErrorValue field values

Status code	Message
0x116	The maximum number of paths to a controller have been exceeded. RDAC currently supports only one path to a controller (SM 7.x) or up to 4 paths to a controller (SM 8.x).
0x117	WWN mismatch on two sides of a LUN.
0x118	Unable to allocate an RDAC structure.
0x119	Could not create a device object or directory during an “AddDevice” request.
0x122	A controller failover occurred due to an I/O error. Examples of this include resets and LUNs becoming ready.

Table 5. UniqueErrorValue field values (continued)

Status code	Message
0x123	A path to a multipath controller has failed.
0x124	A controller failover has failed. No retries will be performed.
0x125	Controller failover event due to all paths being removed. LUN is configured and owned by the alternate. The current path is changed and a MODE_SELECT request (RDAC Classic only) is issued.
0x126	Controller failover due to some LUNs being owned by an inaccessible alternate controller at startup.
0x201	SCSI recovered error on a controller.
0x202	SCSI hardware error on a controller.
0x203	SCSI unit attention on a controller.
0x204	SCSI aborted command on a controller.
0x205	SCSI media error on a controller.

Also, the ErrorCode field will vary depending on the sense data (see Table 6).

Table 6. Sense data

Sense key	RDAC status code	ErrorCode
1	0x201	IO_ERR_RETRY_SUCCEEDED (Event ID 1)
3	0x205	IO_ERR_BAD_BLOCK (Event ID 7)
4 (ASCs of 0x0c, 0x3[1,2], 0x4[0,3,4,5,b], 0x8[0.5.7], 0x95, 0xc0, 0xd0, 0xd1, 0xe1)	0x202	IO_ERR_CONTROLLER_ERROR (Event ID 11)
6 (ASCs of 0x0c, 0x11, 0x3f, 0x40, 0x8[7,8,E], 0x9[1,5,8], 0xa[0,1,4,6,7], 0xc0)	0x203	IO_ERR_INTERNAL_ERROR (Event ID 12)
0xb (ASCs of 0x4[4,7,8,9,E])	0x204	IO_ERRO_CONTROLLER_ERROR (Event ID 11)

Table 7 shows the SRB status codes that are defined.

Table 7. Defined SRB status codes

Label identifier	Code
SRB_STATUS_PENDING	0x00
SRB_STATUS_SUCCESS	0x01
SRB_STATUS_ABORTED	0x02
SRB_STATUS_ABORT_FAILED	0x03
SRB_STATUS_ERROR	0x04
SRB_STATUS_BUSY	0x05
SRB_STATUS_INVALID_REQUEST	0x06

Table 7. Defined SRB status codes (continued)

Label identifier	Code
SRB_STATUS_INVALID_PATH_ID	0x07
SRB_STATUS_NO_DEVICE	0x08
SRB_STATUS_TIMEOUT	0x09
SRB_STATUS_SELECTION_TIMEOUT	0x0A
SRB_STATUS_COMMAND_TIMEOUT	0x0B
SRB_STATUS_MESSAGE_REJECTED	0x0D
SRB_STATUS_BUS_RESET	0x0E
SRB_STATUS_PARITY_ERROR	0x0F
SRB_STATUS_REQUEST_SENSE_FAILED	0x10
SRB_STATUS_NO_HBA	0x11
SRB_STATUS_DATA_OVERRUN	0x12
SRB_STATUS_UNEXPECTED_BUS_FREE	0x13
SRB_STATUS_PHASE_SEQUENCE_FAILURE	0x14
SRB_STATUS_BAD_SRB_BLOCK_LENGTH	0x15
SRB_STATUS_REQUEST_FLUSHED	0x16
SRB_STATUS_INVALID_LUN	0x20
SRB_STATUS_INVALID_TARGET_ID	0x21
SRB_STATUS_BAD_FUNCTION	0x22
SRB_STATUS_ERROR_RECOVERY	0x23
SRB_STATUS_NOT_POWERED	0x24

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 8 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 8, 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 8. 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

Table 8. Fibre Channel adapter error codes (continued)

Event code offset 34h	More data offset 10h	Description	Suggested action
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

Table 8. Fibre Channel adapter error codes (continued)

Event code offset 34h	More data offset 10h	Description	Suggested action
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
* 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 non-cached 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	

Table 8. Fibre Channel adapter error codes (continued)

Event code offset 34h	More data offset 10h	Description	Suggested action
* F01Exxxx	Yyyzzzz	Error running post RISC code: xxxx = mailbox0; Yyyy = mailbox1; zzzz = mailbox2	
* F01Fxyyy	Zzzzzzz	DMA 64 bit (PAE) configuration (for information only): xx = Dma64BitAddressess flag set by W2K; yy = Dma64BitAddressess flag set by driver; zzzzzzz = driver adapter flags	
F0200000	Xxxxyyyy	Error ISP not accessible: xxxx = ISP host command and control; yyyy = ISP interrupt status	
* 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	

FASTt Storage Manager automatic discovery of storage subsystems

The section titled “Starting Enterprise Management” in Chapter 4 of the *User’s Reference* describes the IBM FASTt Storage Manager automatic-discovery feature, which discovers all hosts and storage subsystems on the local subnetwork. If you launch FASTt Storage Manager on the Model 326 (as opposed to a separate Windows 2000 client computer) and perform automatic discovery (by clicking **Yes** on the Confirm Initial Automatic Discovery panel that appears when you launch the application), be aware that FASTt Storage Manager is fully capable of managing any subsystems that are discovered, even if you want to manage only the subsystems that are contained in the Model 326. When automatic discovery has completed, the host for the Model 326 (containing its subsystems) can be identified from the device tree (in the left pane of the Enterprise Management window) by the Model 326 machine name (this is also listed as the root of the device tree).

If you do not perform automatic discovery, you must manually add the storage subsystems of the Model 326 by performing the following procedure in the Enterprise Management window:

1. From the menu bar, select **Edit → Add Device....**
2. Type the Model 326 system name (displayed in the top of the left pane of the Enterprise Management window) in the Add Device panel, then click **Add**. The host and storage subsystems for the Model 326 should be added to the device tree in the left pane of the Enterprise Management window.
3. Click **Close**.

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