



StorNext 3.5.2.1 Release Notes

Product	StorNext 3.5.2.1
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Purpose of This Release

StorNext 3.5.2.1 is an interim release which addresses previously identified issues and also resolves some critical issues such as the following:

- CR 31279 (SR 1119366): Corrected an issue which caused data corruption with large mixed data/metadata stripe groups. For more information, refer to StorNext Product Alert 35.
- CR 31280 (SR 1119366): Resolved a condition which resulted in an endless loop when cvfsck reached the point where it writes out the bit map.
- CR 31276 (SR 1113942): Resolved an issue in which using large values for POL_STORE_RESP_ABORT_TIME caused integer overflow. For more information, refer to StorNext Product Alert 34.
- CR 31277 (SR 1113942): Corrected a condition which prevented retrieving files from either copy stored on SDISK (2 copies). For more information, refer to StorNext Product Alert 34.
- CR 31278 (SR 1119366): Corrected a condition in which "fsrcopy -c ..." failed if SDISK file was missing.
- CR 31440 (SR 1100192): Corrected a situation in which disk I/O error status returns could be lost.
- CR 31441 (SR 1050240): Corrected a condition which prevented one or more clients from attaching properly to the new FSM during failover testing.
- CR 31442 (SR 1078134): Resolved a condition which prevented a client that had a file open for exclusive write from reconnecting to a new FSM.
- CR 31544 (SR 1147310): Resolved an issue in which the external api interface returned the current number of clients instead of the maximum number of clients.

This document also describes supported platforms and system components, as well as currently known issues, issues that were resolved for this release, and known limitations.

Visit www.quantum.com/ServiceandSupport for additional information and updates for StorNext.

Other Changes in This Release

The delivery mechanism for client software has changed for release 3.5.2.1. Client software for all operating systems is now contained on one disk labeled "Client Software and Product Documentation." (Formerly, client software was distributed on the software disks for all operating systems.)

As a result of this change, you must now insert the client software disk, copy the client software from the disk, and then install or upgrade the client packages as described in the *StorNext 3.5.2.1 Installation Guide*.

In addition, client software is no longer distributed in compressed format (such as tar.gz files). Instead, the client software disk contains executable files which, when launched, extract the client software for the selected platform to the location `/tmp/stornext` where you can install the package. Windows client packages have not changed, and are still in .zip format.

For more information and specific installation instructions, see the *StorNext 3.5.2.1 Installation Guide*.

Configuration Requirements

Before installing StorNext 3.5.2.1, note the following configuration requirements:

- In cases where gigabit networking hardware is used and maximum StorNext performance is required, a separate, dedicated switched Ethernet LAN is recommended for the StorNext metadata network. If maximum StorNext performance is not required, shared gigabit networking is acceptable.
- A separate, dedicated switched Ethernet LAN is mandatory for the metadata network if 100 Mbit/s or slower networking hardware is used.
- StorNext does not support file system metadata on the same network as iSCSI, NFS, CIFS, or VLAN data when 100 Mbit/s or slower networking hardware is used.
- The operating system on the metadata controller must always be run in U.S. English.
- For Windows systems (server and client), the operating system must always be run in U.S. English.

Caution: If a Library used by StorNext Storage Manager is connected via a fibre switch, zone the switch to allow only the system(s) running SNSM to have access to the library. This is necessary to ensure that a “rogue” system does not impact the library and cause data loss or corruption. For more information, see StorNext Product Alert 16.

Library Requirements

The following libraries require special configurations to run StorNext.

DAS and Scalar DLC Network-Attached Libraries

Prior to launching the StorNext Configuration Wizard, DAS, and Scalar DLC network-attached libraries must have the DAS client already installed on the appropriate host control computer.

DAS Attached Libraries

For DAS attached libraries, refer to “Installation and Configuration” and “DAS Configuration File Description” in the *DAS Installation and Administration*

Guide. The client name is either the default StorNext server host name or the name selected by the administrator.

StorNext can support LTO-3 WORM media in DAS connected libraries, but WORM media cannot be mixed with other LTO media types in one logical library.

To use LTO-3 WORM media in a logical library, before configuring the library in StorNext, set the environmental variable `XDI_DAS_MAP_LTO_TO_LTOW` in the `/usr/adic/MSM/config/envvar.config` file to the name of the library. The library name must match the name given to the library when configuring it with StorNext. If defining multiple libraries with this environmental variable, separate them with a space. After setting the environmental variable, restart StorNext Storage Manager (SNSM).

Note: SDLC software may not correctly recognize LTO-3 WORM media in the library and instead set it to “unknown media type.” In this case you must manually change the media type to “LTO3” using the SDLC GUI.

Scalar DLC Attached Libraries

For Scalar 10K and Scalar 1000 DLC attached libraries, refer to “Installation and Configuration” and “Client Component Installation” in the *Scalar Distributed Library Controller Reference Manual* (6-00658-02).

The DAS client should be installed during the installation of the Scalar DLC attached libraries. Use this procedure to install the DAS client.

- 1 Select **Clients > Create DAS Client**.

The client name is either the default StorNext server host name or the name selected by the administrator.

- 2 When the DAS client is configured in Scalar DLC, select **Aliasing**.

- 3 Select **sony_ait** as the **Media** aliasing.

- 4 The default value is 8mm.

- 5 Verify that **Element Type** has **AIT** drive selected.

- 6 Click **Change** to execute the changes.

ACSLs Attached Libraries

Due to limitations in the STK ACSLS interface, StorNext supports only single ACS configurations (ACS 0 only). StorNext support requires that the ACSLS client be installed on the appropriate host machine.

Disk Requirements

Disk devices must support, at minimum, the mandatory SCSI commands for block devices as defined by the SCSI Primary Commands-3 standard (SPC-3) and the SCSI Block Commands-2 (SBC-2) standard.

To ensure disk reliability, Quantum recommends that disk devices meet the requirements specified by Windows Hardware Quality Labs (WHQL) testing. However, there is no need to replace non-WHQL certified devices that have been used successfully with StorNext.

Disk devices must be configured with 512-byte or 4096-byte sectors, and the underlying operating system must support the device at the given sector size. StorNext customers that have arrays configured with 4096-byte sectors can use only Windows, Linux and IRIX clients. Customers with 512-byte arrays can use clients for any valid StorNext operating system (i.e., Windows, Linux, or UNIX).

In some cases, non-conforming disk devices can be identified by examining the output of `cvlabel -vvv1`. For example:

```
/dev/rdisk/c1d0p0: Cannot get the disk physical info.
```

If you receive this message, contact your disk vendors to determine whether the disk has the proper level of SCSI support.

Disk Naming Requirements

When naming disks, names should be unique across all SANs. If a client connects to more than one SAN, a conflict will arise if the client sees two disks with the same name.

LDAP Support Requirement

LDAP (Lightweight Directory Access Protocol) support requires Windows Active Directory.

Configuring Quantum Libraries for Solaris 10

To ensure that Quantum libraries are recognized and tape drives function properly, follow the configuration procedure below. This procedure works for the PX502 library and other Quantum tape libraries.

Note: You must be using update 4 or newer for Solaris 10 in order for tape drives to function properly.

- 1 Edit the `/etc/driver_aliases` file by removing or commenting out the following ST driver entries (if they exist):
 - `"scsiclass,01"`
 - `"scsiclass,08"`
- 2 Open the `/kernel/drv/sgen.conf` file and verify that the following entries are present in the file, adding them if necessary:
 - `inquiry-config-list="ADIC","*";`
 - `inquiry-config-list="QUANTUM","*";`
 - `inquiry-config-list="HP","*";`
 - `device-type-config-list="changer","sequential";`
- 3 Reboot the Solaris system to unload any drivers that have been loaded.
- 4 After rebooting, enter the following commands to configure and load new sgen drivers:
 - `update_drv -a -i '"scsiclass,01"' sgen`
 - `update_drv -a -i '"scsiclass,08"' sgen`

5 Enter the command "cfgadm -alv". You should see the following entries in the cfgadm list:

```
c2::500e09e00b40a000          connected   configured   unknown
QUANTUM PX500
unavailable med-changer n           /devices/pci@8,700000/fibre-
channel@3/fp@0,0:fc::500e09e00b40a000
c2::500e09e00b40a010          connected   configured   unknown
HP Ultrium 3-SCSI
unavailable tape n           /devices/pci@8,700000/fibre-
channel@3/fp@0,0:fc::500e09e00b40a010
```

Operating System Requirements

[Table 1](#) shows the operating systems, kernel versions, and hardware platforms that support StorNext File System, StorNext Storage Manager, and the StorNext client software.

This table also indicates the platforms that support the following:

- MDC Servers
- File System SAN Clients
- Distributed LAN Servers
- File System LAN Clients
- Storage Manager

Table 1 StorNext Supported Oses and Platforms

StorNext 3.5.2.1 Components Supported Operating Systems and Platforms							
Operating System	Kernel or Release	Platform	MDC Server	File System SAN Client	Distributed LAN Server	File System LAN Client	Storage Manager / SNAPI
Windows Server 2003	R2 SP2	x86 32-bit	✓	✓	✓	✓	
		x86 64-bit	✓	✓	✓	✓	
Windows XP	SP2	x86 32-bit		✓		✓	
		x86 64-bit		✓		✓	
	SP3	x86 32-bit		✓		✓	
		x86 64-bit		✓		✓	
Windows Vista	SP1	x86 32-bit		✓		✓	
		x86 64-bit		✓		✓	
	SP2	x86 32-bit		✓		✓	
		x86 64-bit		✓		✓	
Windows Server 2008	SP1	x86 32-bit		✓		✓	
		x86 64-bit	✓	✓	✓	✓	
	R2	x86 32-bit		✓		✓	
		x86 64-bit	✓	✓	✓	✓	
	SP2	x86 32-bit		✓		✓	
		x86 64-bit	✓	✓	✓	✓	
Windows 7	N / A	x86 32-bit		✓		✓	
		x86 64-bit		✓		✓	

Notes: When adding StorNext Storage Manager to a StorNext File System environment, the metadata controller (MDC) must be moved to a supported platform. If you attempt to install and run a StorNext 3.5.2.1 server that is not supported, you do so at your own risk. Quantum strongly recommends against installing non-supported servers.

* MDC, DLS, and SM not recommended due to memory management issues.

StorNext 3.5.2.1 Components Supported Operating Systems and Platforms (Continued)							
Operating System	Kernel or Release	Platform	MDC Server	File System SAN Client	Distributed LAN Server	File System LAN Client	Storage Manager / SNAPI
RHEL 4 ‡	2.6.9-67.EL (Update 6) †	x86 32-bit	✓	✓	✓	✓	
	2.6.9-78.EL (Update 7) †	x86 32-bit	✓	✓	✓	✓	
	2.6.9-89.EL (Update 8)	x86 32-bit	✓	✓	✓	✓	
	2.6.9-67.EL (Update 6) †	x86 64-bit	✓	✓	✓	✓	
	2.6.9-78.EL (Update 7) †	x86 64-bit	✓	✓	✓	✓	
	2.6.9-89.EL (Update 8)	x86 64-bit	✓	✓	✓	✓	✓**
RHEL 5 ‡	2.6.18-53.EL (Update 1) †	x86 64-bit	✓	✓	✓	✓	✓
	2.6.18-92.EL (Update 2) †	x86 64-bit	✓	✓	✓	✓	✓
	2.6.18-128 (Update 3) †	x86 64-bit	✓	✓	✓	✓	✓
	2.6.18-164.EL (Update 4)	x86 64-bit	✓	✓	✓	✓	✓

** Storage Manager should not be used with earlier service packs for RHEL4 due to a critical tape rewind problem in the RHEL4 kernel. In order to install StorNext Storage Manager on a Red Hat Enterprise Linux 4 system, you MUST first install 2.6.9-98 EL (Update 8).

† All releases of RHEL4 and RHEL5 except RHEL4 Update 8 and RHEL5 Update 4 have a possible silent data corruption issue as documented in Product Alert #20. Quantum recommends that users migrate to RHEL4 Update 8 or RHEL5 Update 4 as soon as possible. Also, note that the “Xen” virtualization software is not supported for RHEL 4 and RHEL 5.

‡ HBA multipath customers: please verify with your HBA vendor that your current multipath driver is supported for any planned Linux OS version/update/service pack level. If your driver is not supported for your planned Linux OS version/update/service pack, the StorNext client or server may not be functional after your Linux upgrade.

Note: For systems running Red Hat Enterprise Linux version 4 or 5, before installing StorNext you must first install the kernel header files (shipped as the kernel-devel-smp or kernel-devel RPM).

For systems running SUSE Linux Enterprise Server, you must first install the kernel source code (typically shipped as the kernel-source RPM).

Caution: Red Hat 5 ships with secure Linux kernel enabled by default. To ensure proper StorNext operation, you must not install Red Hat 5 with secure Linux enabled. The secure Linux kernel must be off, or the file system could fail to start.

StorNext 3.5.2.1 Components Supported Operating Systems and Platforms (Continued)							
Operating System	Kernel or Release	Platform	MDC Server	File System SAN Client	Distributed LAN Server	File System LAN Client	Storage Manager / SNAPI
SLES 10 †† ± ***	2.6.16-46-0.12 (SP1)	x86 32-bit		✓		✓	
	2.6.16.60-0.27 (SP2)	x86 32-bit		✓		✓	
	2.6.16.60-0.54.5 (SP3)	x86 32-bit		✓		✓	
	2.6.16-46-0.12 (SP1)	x86 64-bit	✓	✓	✓	✓	✓
	2.6.16.60-0.27 (SP2)	x86 64-bit	✓	✓	✓	✓	✓
	2.6.16.60-0.54.5 (SP3)	x86 64-bit	✓	✓	✓	✓	✓
	2.6.16-46-0.12 (SP1)	Itanium 64-bit	✓	✓			
	2.6.16.60-0.27 (SP2)	Itanium 64-bit	✓	✓			
	2.6.16.60-0.54.5 (SP3)	Itanium 64-bit	✓	✓			
SLES 11 ± ***	2.6.27.19-5	x86 64-bit		✓		✓	
		Itanium 64-bit	✓	✓			

†† SLES 10 SP1 (and earlier) and SP2 kernels earlier than 37 are sensitive to the same silent data corruption issue documented in Product Alert #20. The problem has been fixed in SP2 that includes level 2.6.16.60-0.37_f594963d, in SLES 10 SP3, and in the SLES 11 releases. There is no recommended workaround at this time.

‡ HBA multipath customers: please verify with your HBA vendor that your current multipath driver is supported for any planned Linux OS version/update/service pack level. If your driver is not supported for your planned Linux OS version/update/service pack, the StorNext client or server may not be functional after your Linux upgrade.

***A "roll" of a particular digit is not indicative that a new SLES service pack has been declared by Novell. The kernel revisions listed in this document are typically (but not always), the first kernel revision of the service pack. Later revisions within the service pack are typically, but not always, supported.

StorNext 3.5.2.1 Components Supported Operating Systems and Platforms (Continued)							
Operating System	Kernel or Release	Platform	MDC Server	File System SAN Client	Distributed LAN Server	File System LAN Client	Storage Manager / SNAPI
Sun Solaris 10	Generic 120011-14	sparc 64-bit	✓	✓			✓
	Generic 127128-11	Opteron x86 64-bit		✓		✓	
		Intel x86 64-bit		✓		✓	
SGI-IRIX	6.5.30	64-bit MIPS		✓			
IBM AIX	5.3	64-bit Power Architecture		✓			
HP-UX	11i v2	Itanium 64-bit		✓			
Apple Xsan	MacOS X 10.5.5 w/Xsan 2.1.1, StorNext MDC ‡	x86 32-bit		✓			
(Apple Leopard machines run with 32-bit kernel, 64-bit user)	MacOS X 10.6 w/Xsan 2.2, StorNext MDC	x86 32-bit		✓			
		x86 64-bit		✓			
	MacOS X 10.6 w/Xsan 2.2.1, StorNext MDC	x86 32-bit		✓			
		x86 64-bit		✓			

‡ Releases earlier than MacOS X 10.5.5 may have limited Windows Access Control Lists (ACL) functionality.

Note: GNU tar is required on Solaris systems. In addition, for systems running Solaris 10, install the Recommended Patch Cluster (dated March 10, 2006 or later) before installing StorNext. To enable support for LUNs greater than 2TB on Solaris 10, the following patches are required:

- 118822-23 (or greater) Kernel Patch
- 118996-03 (or greater) Format Patch
- 119374-07 (or greater) SD and SSD Patch
- 120998-01 (or greater) SD Headers Patch

Supported Libraries and Tape Drives

Libraries and tape drives supported for use with StorNext 3.5.2.1 are presented in [Table 2](#). Where applicable, minimum firmware levels for libraries are provided.

Table 2 StorNext Supported Libraries and Tape Drives

StorNext 3.5.2.1 Supported Libraries and Tape Drives					
Vendor Library Family	Libraries	Enforced Minimum / Recently Tested Library Firmware Level	Drive Types	Enforced Minimum / Recently Tested Drive Firmware Level	Notes
Quantum / ADIC	Scalar i500	Minimum: 140G	IBM LTO-1		Library firmware upgrade may be required for LTO-3 WORM support 420G.GS00400
			IBM LTO-2		
			IBM LTO-3		
			IBM LTO-4		
			BM LTO-3 WORM		
			IBM LTO-4 WORM		
			HP LTO-4		
	Scalar i2000	Minimum: 120A Minimum (IBM LTO-3, IBM LTO-3 WORM): 300A Minimum (IBM LTO-4, IBM LTO-4 WORM) 540A Minimum: 7404 i/o blades and i6.5 require 590A	IBM LTO-1		See library firmware requirement
			IBM LTO-2		
			IBM LTO-3		
			IBM LTO-4		
			IBM LTO-3 WORM		
			IBM LTO-4 WORM		
			HP LTO-4		
			HP LTO-4 WORM		
			DLT-S4	Minimum: 1F1F	
	Scalar 24	Minimum: 107A.GY0002	IBM LTO-1		Not including WORM
			IBM LTO-2		
			IBM LTO-3		
			IBM LTO-4		
	Scalar i40	Tested: 101G.GS005	HP LTO-4		
	Scalar 50	Minimum: 002A	HP LTO-4		
	Scalar 100	Minimum: 2.05.0003	IBM LTO-1		Not including WORM NOTE: 2.10.0013 is bad firmware
			IBM LTO-2		
			IBM LTO-3		
			AIT-2		
	Scalar 1000	Minimum: 3.00.0017	IBM LTO-2		
			IBM 3590B1A		
AIT-1					
Scalar 10K	Minimum: 110A.00001 Minimum (IBM LTO-3, Minimum (IBM LTO-4,	IBM LTO-1		See library firmware requirement	Must use SDLC/SCSI target or SCSI direct attached. DAS/ACI is no longer supported.
		IBM LTO-2			
		IBM LTO-3			
		IBM LTO-4			
		IBM LTO-3 WORM			
		AIT-2			
		AIT-2 WORM			

Note: Before using DLT cleaning with DLT-S4 or SDLT 600 drives, configure the library (Scalar i2000 or PX720) to disable reporting of the media ID. If media ID reporting is not disabled, StorNext will not recognize the cleaning media (SDLT type 1).

StorNext 3.5.2.1 Supported Libraries and Tape Drives (Continued)					
Vendor Library Family	Libraries	Enforced Minimum / Recently Tested Library Firmware Level	Drive Types	Enforced Minimum / Recently Tested Drive Firmware Level	Notes
Quantum / ADIC	PX500	Minimum: 001A	HP LTO-3		Not including WORM 30.0
	PX720	Minimum: 4.00	HP LTO-2		Not including WORM
			HP LTO-3		
			DLT-S4		
DXI 7500	Recently Tested: 05.02.084	Supported emulations include: DLT7000, SDLT320, SDLT600, DLT-S4, Quantum/Certance LTO-2, 3, HP LTO-1, 2, 3, 4, IBM LTO-1, 2, 3, 4			
Dell	PV136T	Minimum: 3.11	IBM LTO-2		
			IBM LTO-3		
			IBM LTO-4		
HP	ESL E Series	Minimum: 4.10	HP LTO-3		
			HP LTO-4		
	MSL 6000	Minimum: 0507	HP LTO-2		
			HP LTO-3		
			HP LTO-4		
	MSL G3 Series (2024/4048/8096)	Minimum 2024: 0370 (3.70) Minimum 4048: 0600 (6.00) Minimum 8096: 0850 (8.50)	HP LTO-2		Including Regular and WORM
			HP LTO-3		
			HP LTO-4		
EML E-Series	Minimum: 1070	HP LTO-3		LTO-4 WORM added to matrix at SN 3.5.1; it was validated earlier but missing from earlier release matrices	
		HP LTO-4			
		LTO-4 WORM			
IBM	TS3500	Minimum: 4680	IBM LTO-2		Clarifications added to capture IBM 3592 and TS1120 model naming scheme
			IBM LTO-3		
			IBM LTO-4		
			IBM 3592 (J1A and E05)		
			IBM TS1120 (E05)		
Qualstar	XLS	Minimum: 0880	IBM LTO-3		
			IBM LTO-4		
Sony	Petasite CSM-200	Minimum: 6.30	IBM LTO-4 drive (T1600)		
Spectralogic	T-Series	Recently Tested: 2000	LTO-3	Vendor supported: 93G0	See Bulletin 46. Library firmware is known as BlueScale 11.
			LTO-4	Recently tested: 97F9	

Note: Before using DLT cleaning with DLT-S4 or SDLT 600 drives, configure the library (Scalar i2000 or PX720) to disable reporting of the media ID. If media ID reporting is not disabled, StorNext will not recognize the cleaning media (SDLT type 1).

StorNext 3.5.2.1 Supported Libraries and Tape Drives (Continued)					
Vendor Library Family	Libraries	Enforced Minimum / Recently Tested Library Firmware Level	Drive Types	Enforced Minimum / Recently Tested Drive Firmware Level	Notes
Sun / StorageTek SCSI/FC Libraries	L180/ L700/ L1400	Minimum: 3.18.02	T9840C		
			T9840D		
			T10000A		See Note 2
			T10000B	See Note 4	See Notes 2 and 3
			HP LTO-3		
			HP LTO-4		
			IBM LTO-3		
	IBM LTO-4				
	SL3000	Minimum: 2.30	T9840C		
			T9840D		
			T10000A		See Note 2
			T10000B	See Note 4 Firmware 2.35 is required to prevent a tape cleaning problem introduced with 1.38.209.	See Notes 2 and 3
			HP LTO-3		
			HP LTO-4		
			IBM LTO-3		
	IBM LTO-4				
	SL500	Minimum: 1373	HP LTO-3		
			HP LTO-4		
			IBM LTO-3		
IBM LTO-4					
9740	Minimum: 2000	Sun/STK 9840		Obsolete	
		Sun/STK 9940			
Sun / StorageTek ACSLS (pre-7.3) Libraries See Note 5	9310	Minimum: None	T10000 Rev A		
	9710	Minimum: None			
	9740	Minimum: 2000			
	L5500	Minimum: None			
	L700	Minimum: 2.36	Sun/STK 9840, Sun/STK 9940, Sun/STK 9940B, T10000 Rev A, HP LTO-2, HP LTO-4, IBM LTO-2, IBM LTO-3, IBM LTO-4		See Note 3
	L180	Minimum: 2.00			
	SL8500				
SL500	Minimum: 10.67			Not including WORM	

Note 1: The Sun / StorageTek FC and ACSLS sections have been modified to include drive and library permutations that are "paper certified" based on testing that has been performed and validated by Sun/STK.

Note 2: Tape cleaning problem introduced with 1.38.209, special fix at RA1.38.209. 1.40.x firmware level where fix was rolled forward has not been determined yet.

Note 3: When using T10000 drives, the STK library parameter "Fastload" must be set to "OFF".

Note 4: Minimum: RA1.38.209, but note that 1.38.209 manifests a tape cleaning issue. Recently tested: 1.40.208 (with tape cleaning failure)

Note 5: ACSLS versions prior to ACSLS 7.3 have not been tested with this release.

StorNext 3.5.2.1 Supported Libraries and Tape Drives (Continued)					
Vendor Library Family	Libraries	Enforced Minimum / Recently Tested Library Firmware Level	Drive Types	Enforced Minimum / Recently Tested Drive Firmware Level	Notes
Sun / StorageTek ACSLS 7.3 Libraries See Notes 1 and 5	L180/ L700/ L1400	Minimum: 3.18.02	T9840C		
			T9840D		
			T10000A		See Note 2
			T10000B	See Note 4	See Notes 2 and 3
			HP LTO-3		
			HP LTO-4		
			IBM LTO-3		
			IBM LTO-4		
	SL3000	Minimum: 0230	T9840C		
			T9840D		
			T10000A		See Note 2
			T10000B	1.44 See Note 4	See Notes 2 and 3
			HP LTO-3		
			HP LTO-4		
			IBM LTO-3		
			IBM LTO-4		
	SL500	Minimum: 1373	HP LTO-3		
			HP LTO-4		
			IBM LTO-3		
			IBM LTO-4		
	SL8500	Minimum: 4.14 Recently Tested: 4.70	T9840C		
			T9840D		
			T10000A		See Note 2
			T10000B	1.44 See Note 4	See Notes 2 and 3
			HP LTO-3		
			HP LTO-4		
			IBM LTO-3		
			IBM LTO-4		

- Note 1: The Sun / StorageTek FC and ACSLS sections have been modified to include drive and library permutations that are "paper certified" based on testing that has been performed and validated by Sun/STK.
- Note 2: Tape cleaning problem introduced with 1.38.209, special fix at RA1.38.209. 1.40.x firmware level where fix was rolled forward has not been determined yet.
- Note 3: When using T10000 drives, the STK library parameter "Fastload" must be set to "OFF".
- Note 4: Minimum: RA1.38.209, but note that 1.38.209 manifests a tape cleaning issue. Recently tested: 1.40.208 (with tape cleaning failure)
- Note 5: ACSLS versions prior to ACSLS 7.3 have not been tested with this release.

Minimum Firmware Levels for StorNext Drives

Where applicable, the minimum firmware levels for StorNext-supported drives are shown in [Table 3](#).

Table 3 Minimum Firmware Levels for Drives

StorNext 3.5.2.1 Minimum Firmware Levels for Drives		
Drive Type	Minimum Drive Firmware Level	Notes
IBM LTO-1	25D4	a.k.a. ULT3580-TD1 and Ultrium-TD1
IBM LTO-2	3AY4	a.k.a. ULT3580-TD2 and Ultrium-TD2
IBM LTO-3 IBM LTO-3 WORM	4C17	a.k.a. ULT3580-TD3 and Ultrium-TD3
IBM LTO-4	71G0	a.k.a. ULT3580-TD4 and Ultrium-TD4

Note: When using IBM ULTRIUM-TD3 drives with SUSE Linux Enterprise Server 10, you must upgrade the drive firmware to version 64D0 or later.

Supported System Components

System components that are supported for use with StorNext 3.5.2.1 are presented in [Table 4](#).

Table 4 StorNext Supported System Components

Component	Description
Tested Browsers	Internet Explorer 6.0 or later (up to 8.x) Mozilla Firefox 2.0 or later (up to 3.x) (Minimum browser resolution: 800x600) NOTE: Disable pop-up blockers.

Component	Description
LTO-1 Media and LTO-3 or LTO-4 Tape Drive Compatibility	<p>LTO-1 media in a library containing LTO-3 or LTO-4 drives are considered for store requests unless they are logically marked as write protected. When LTO-1 media is mounted in an LTO-3 or LTO-4 drive, StorNext marks the media as write protected. Quantum recommends circumventing LTO-1 media for store requests by following this procedure:</p> <ol style="list-style-type: none"> 1 From the SNSM home page, choose Attributes from the Media menu. 2 On the Change Media Attributes window, select the LTO-1 media from the list. 3 Click the Write Protect option. 4 Click Apply to make the change. 5 Repeat the process for each piece of LTO-1 media. <p>NOTES: A similar issue exists for LTO-2 media in a library containing LTO-4 tape drives. LTO-3 drives can read but not write LTO-1 tapes. LTO-4 drives can read but not write LTO-2 tapes, and also cannot read LTO-1 tapes at all.</p>
NFS	<p>Version 3</p> <p>NOTE: An NFS server that exports a StorNext file system with the default export options may not flush data to disk immediately when an NFS client requests it. This could result in loss of data if the NFS server crashes after the client has written data, but before the data has reached the disk.</p> <p>This issue may be addressed in a future StorNext release. As a workaround, add the <code>no_wdelay</code> option to each line in the <code>/etc/exports</code> file that references a StorNext file system. For example, typical export options would be <code>(rw, sync, no_wdelay)</code>.</p>
Addressable Power Switch	<p>WTI RPS-10m WTI IPS-800</p> <p>The RPS-10m (master) is supported. The RPS-10s (slave) is not supported.</p>
LDAP	<p>LDAP (Lightweight Directory Access Protocol) support requires Windows Active Directory.</p>

Hardware Requirements

To successfully install StorNext 3.5.2.1, the following hardware requirements must be met:

- [StorNext File System and Storage Manager Requirements](#) on page 17
- [StorNext Client Software Requirements](#) on page 18.

Note: The following requirements are for running StorNext only. Running additional software (including the StorNext client software) requires additional RAM and disk space.

StorNext File System and Storage Manager Requirements

The hardware requirements for StorNext File System and Storage Manager are presented in [Table 5](#).

Table 5 File System and Storage Manager Hardware Requirements

No. of File Systems	RAM	File System Disk Space	Storage Manager Disk Space
1–4*	2 GB	2 GB	For application binaries, log files, and documentation: up to 30GB (depending on system activity) For support directories: 3 GB per million files stored
5–8**	4 GB	4 GB	

*Two or more CPU cores are recommended for best performance.

**Two or more CPU cores are required for best performance.

Note: If a file system uses deduplicated storage disks (DDisks), note the following additional requirements:

- Requires 2 GB RAM per DDisk in addition to the base RAM noted in [Table 5](#).
 - Requires an additional 5GB of disk space for application binaries and log files.
 - Deduplication is supported only for file systems running on a Linux operating system (x86 32-bit or x86 64-bit).
 - An Intel Pentium 4 or later processor (or an equivalent AMD processor) is required. For best performance, Quantum recommends an extra CPU per DDisk.
-

StorNext Client Software Requirements

To install and run the StorNext client software, the client system must meet the following minimum hardware requirements.

For SAN (FC-attached) clients or for Distributed LAN Clients:

- 1 GB RAM
- 500 MB available hard disk space

For SAN clients acting as a Distributed LAN Server:

- 2 GB RAM
- 500 MB available hard disk space

Note: Distributed LAN servers may require additional RAM depending on the number of file systems, Distributed LAN Clients, and NICs used. See [Distributed LAN Server Memory Tuning](#) in the StorNext User's Guide for Distributed LAN Server memory tuning guidelines.

Resolved Issues

The following sections list resolved issues in this release of StorNext:

- [StorNext File System Resolved Issues](#) on page 18
- [StorNext Storage Manager Resolved Issues](#) on page 19
- [StorNext GUI and Installation Resolved Issues](#) on page 20

Note: There is no change to cryptographic functionality in StorNext release 3.5.2.1.

StorNext File System Resolved Issues

[Table 6](#) lists resolved issues that are specific to StorNext File System.

Table 6 StorNext File System Resolved Issues

Operating System	CR Number	SR Number	Description
Linux	31440	1100192	Corrected a situation in which disk I/O error status returns could be lost.

Operating System	CR Number	SR Number	Description
All	31279	1119366	Corrected an issue which caused data corruption with large mixed data/metadata stripe groups.
	31280	1119366	Resolved a condition in which cvfsck cast to int resulted in an endless loop.
	31441	1050240	Corrected a condition which prevented one or more clients from attaching properly to the new FSM during failover testing.
	31442	1078134	Resolved a condition which prevented a client that had a file open for exclusive write from reconnecting to a new FSM.
	31544	1147310	Resolved an issue in which the external api interface returned the current number of clients instead of the maximum number of clients.

StorNext Storage Manager Resolved Issues

[Table 7](#) lists resolved issues that are specific to StorNext Storage Manager.

Table 7 StorNext Storage Manager Resolved Issues

Operating System	CR Number	SR Number	Description
All	31276	1113942	Resolved an issue in which using large values for POL_STORE_RESP_ABORT_TIME caused integer overflow.
	31277	1113942	Corrected a condition which prevented retrieving files from available copies stored on SDISK.
	31278	1119366	Corrected a condition in which running "fsrmcopy -c ..." failed if SDISK file was missing.

StorNext GUI and Installation Resolved Issues

[Table 8](#) lists resolved issues that are specific to the StorNext GUI or the installation process.

Table 8 StorNext GUI and Installation Resolved Issues

Operating System	CR Number	SR Number	Description
All	31283	n/a	The StorNext GUI now supports new installation files via the client download interface.
	31425	n/a	Changes were made to the installation program to accommodate a CLIENTS directory residing on a different disk.

Known Issues

The following sections list known issues in this release of StorNext, as well as associated workarounds, where applicable:

- [StorNext File System Known Issues](#) on page 21
- [StorNext Storage Manager Known Issues](#) on page 24
- [StorNext GUI Known Issues](#) on page 25
- [StorNext Installation Known Issues](#) on page 27

StorNext File System Known Issues

[Table 9](#) lists known issues that are specific to StorNext File System.

Table 9 StorNext File System
Known Issues

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
HP-UX	24309	n/a	If the <code>cvpaths</code> file contains an invalid wild-card specification (that is, a wild-card pattern that does not include a leading <code>'/</code> character), the <code>fspm</code> process could panic and the <code>cvlabel</code> command might fail with a core dump.	This issue will be addressed in a future StorNext release.
Solaris	24331	755956	Running an anonymous FTP server inside of a StorNext file system could cause a system to crash with the following error: CVFS ASSERTION FAILED: <code>f_cvp->cv_opencnt == 0</code>	This issue will be addressed in a future StorNext release. To work around this issue, install Very Secure FTP Daemon (<code>vsftpd</code>) and use it instead of the FTP daemon (<code>in.ftpd</code>) that is shipped with Solaris.
	24563	n/a	Solaris hosts may need to rescan disk devices after StorNext labels have been applied. In particular, when a StorNext label is put on a LUN less than 1TB in size, Solaris hosts will not be able to use that LUN until they have done a device rescan. A device rescan is accomplished with a boot flag: <code>reboot -- -r</code>	This issue will be addressed in a future StorNext release. In the meantime, work around this issue by rescanning devices using the boot flag <code>reboot -- -r</code> If the labeling operation was performed on a Solaris host, that host does not need to do the rescan. However, some intermediate versions of the Solaris 10 Kernel Jumbo Patch break the necessary functionality to support this; please be sure you have applied the latest Solaris 10 Kernel Jumbo Patch before labeling any StorNext LUNs.

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
Linux	23661	958244	StorNext File System does not support the Linux <code>sendfile()</code> system call. This issue causes Apache web servers to deliver blank pages when content resides on StorNext file systems. This issue also affects Samba servers running on Linux.	The workaround is to disable <code>sendfile</code> usage by adding the following entry into the Apache configuration file <code>httpd.conf</code> : <code>EnableSendfile off</code> The workaround for Samba servers is to add the following line into the configuration file: <code>sendfile=no</code>
	25864	n/a	An NFS server that exports a StorNext file system with the default export options may not flush data to disk immediately when an NFS client requests it. This could result in loss of data if the NFS server crashes after the client has written data, but before the data has reached the disk.	This issue may be addressed in a future StorNext release. As a workaround, add the <code>no_wdelay</code> option to each line in the <code>/etc/exports</code> file that references a StorNext file system. For example, typical export options would be <code>(rw, sync, no_wdelay)</code> .
	26321	n/a	Due to the way Linux handles errors, the appearance of SCSI "No Sense" messages in system logs can indicate possible data corruption on disk devices. This affects StorNext users on Red Hat 4, Red Hat 5, SuSe 9, and SuSe 10.	This issue is not caused by StorNext, and is described in detail in StorNext Product Alert 20. For additional information, see Red Hat 4 CR 480666, Red Hat 5 CR 468088, and SuSE 10 CR 440381.
Windows	25707	n/a	Running the command <code>df</code> showed mapped drives but not the mapped folders and directories for <code>cvfs</code> and <code>ntfs</code> file systems.	The workaround is to use the command <code>mountvol</code> , which shows the directories and folders in the file system that are mount points.

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
Windows	15032	n/a	<p>If you are using Promise RAID controllers on a Windows Server 2008 64-bit system, you must install Promise's PerfectPath software. If you do not install this software, you will be unable to use your Windows Server 2008 system.</p>	<p>Promise is working on a solution to this problem, but in the meantime they have provided the following workaround:</p> <ol style="list-style-type: none"> 1. Install the PerfectPath software on your Windows Server 2008 64-bit system. 2. Restart your system. The login prompt will <i>not</i> appear after you restart. Instead, the Windows Boot Manager screen appears showing an error message: "Windows cannot verify the digital signature for this file" (\Windows\system32\DRIVERS\ perfectpathdsm.sys) 3. From the Windows Boot Manager screen, press Enter to continue. A second Windows Boot Manager screen appears, asking you to choose an operating system or specify an advanced option. 4. On the second Windows Boot Manager screen, press F8 to specify advanced options. The Advanced Boot Options screen appears. 5. On the Advanced Boot Options screen, use the arrow keys to choose the option Disable Driver Signature Enforcement. Choosing this option will cause the system to display the login prompt normally after you reboot. 6. Restart your system.

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
All	26114	n/a	Running <code>cvfsck</code> can crash when a data file is empty.	This issue will be addressed in a future StorNext release.
	27483	983534	The management utility <code>cvadmin</code> allows downing the metadata and journal stripe groups while the file system is active. This allows files to be created on a client until the FSM needs to access the metadata, at which point an ENOSPACE error is generated.	This issue will be addressed in a future StorNext release to prevent <code>cvadmin</code> from allowing stripe groups that have metadata and journaling associated with them to be downed while the file system is active.
	25836	898484	Failover on stripe groups is not currently supported.	This enhancement request may be considered in a future StorNext release.

StorNext Storage Manager Known Issues

[Table 10](#) lists known issues that are specific to StorNext Storage Manager.

Table 10 StorNext Storage Manager Known Issues

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
All	26115	n/a	Failover did not execute properly after an upgrade.	This issue will be addressed in a future StorNext release.
	30877	1071576	When performing offline disk expansion (that is, adding a disk to an existing stripe group while I/O is stopped on the clients), clients locked up until the machines were rebooted.	This issue will be addressed in a future StorNext release. To avoid this issue, Quantum recommends unmounting the file system before the MDC does the offline disk expansion. After the expansion is complete, refresh disks before mounting the file system again.

StorNext GUI Known Issues

[Table 11](#) lists known issues that are specific to the StorNext GUI process.

Table 11 StorNext GUI Known Issues

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
Linux	25685	n/a	The StorNext GUI will label all disks in a stripe group according to the single label type (EFI or VTOC) specified per stripe group. The GUI will overwrite any pre-existing labels if (and <i>only</i> if) the label type is changed from VTOC to EFI or vice versa.	This issue will be addressed in a future StorNext release.

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
All	29577	1045100	<p>After following the procedure in the StorNext User's Guide for deleting an affinity through the StorNext GUI, at least one StorNext user has reported being unable to save a new or modified file to the directory that contained the deleted affinity.</p>	<p>This issue will be addressed in a future StorNext release.</p> <p>Until this issue is resolved, you can use this alternate procedure to delete affinities from the command line.</p> <ol style="list-style-type: none"> 1 Unmount the file system. 2 Stop the file system. 3 Change the file system stripe group <code>Exclusive</code> parameter to <code>No</code>. 4 Start the file system. 5 Mount the file system. 6 Run <code>cvaffinity -l</code> to find the top directory with the affinity you want to delete. 7 Remove the affinity by running the following commands: <pre># find [dir with affinity] -type d -exec cvaffinity -d {} \;</pre> <pre># find [dir with affinity] -type f -exec cvaffinity -d {} \;</pre> 8 Use the command <code>"cvaffinity -l [dir_name]"</code> or <code>"cvaffinity -l [file_name]"</code> to verify that the affinity has been deleted.

StorNext Installation Known Issues

[Table 12](#) lists known issues that are specific to the StorNext installation process.

Table 12 StorNext Installation
 Known Issues

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
Linux (RHEL4 and RHEL5 only)	24692	n/a	When you mount a CD in a Red Hat 4 or 5 system, CDs are mounted by default with a noexec (non-executable) option which prevents you from proceeding with the StorNext installation.	Remount the CD by typing <code>mount -o remount, exec ...</code> Alternatively, mount the CD to a different directory by typing the following: <pre># mkdir /mnt/MOUNT_PATH # mount /dev/cdrom /mnt/MOUNT_PATH # cd /mnt/MOUNT_PATH</pre>
Windows	25777	n/a	Including the <code>.auth_secret</code> file in a non-XSan environment causes the file system to not communicate with the FSMPPM.	This issue will be addressed in a future StorNext release. The workaround is to remove or change the name of the <code>.auth_secret</code> file, providing the client is connecting to a non-Xsan metadata controller. This workaround will not work if the client is connecting to an XSan and a non-XSan metadata controller.

Operating System	CR Number	SR Number	Description	Workaround (if applicable)
Windows	25866	n/a	StorNext upgrades on Vista machines can fail in the middle of installation. This problem is caused by the way Windows Vista handles software upgrades. A related error is described in Microsoft article 263253.	<p>Microsoft has a utility called the Windows Installer Cleanup Utility that removes files left behind by incomplete installations. Access the Microsoft website and search for article ID 290301.</p> <p>To work around this issue, follow these steps:</p> <ol style="list-style-type: none"> 1. Click Start, and then click Run. 2. In the Open box, type Regedit and then click OK. 3. On the Edit menu, click Find. 4. In the Find what box, type Snfs_XXX.dat and then click Find Next. 5. If the search result selects a string value called PackageName, continue with these steps. Otherwise, repeat steps 3-4. 6. Double-click the PackageName string value. 7. In the Value data box, change the installation directory path to the new pathname. For example if the old installation directory path contained OCT10, change that to the current path (e.g, NOV12.) 8. On the Registry menu, click Exit.
All	25192	n/a	VMware snapshots may not be used for virtual machines running StorNext. StorNext does not currently process the loss of state synchronization when a snapshot is restored, so incorrect behavior may result.	This issue may be addressed in a future StorNext release.

Operating Guidelines and Limitations

[Table 13](#) lists updated information and guidelines for running StorNext, as well as known limitations in this release.

Table 13 StorNext Operating Guidelines and Limitations

Operating System / Affected Component	Description
Windows	<p>In StorNext releases prior to 3.5, the StorNext Windows client attempted to keep the UNIX uid, gid and mode bits synchronized with similar fields in the Windows security descriptor. However, these Windows and UNIX fields were often not synchronized correctly due to mapping and other problems. One consequence of this problem was that changing the owner in Windows incorrectly changed the UNIX uid and file permissions and propagated these errors into sub-directories.</p> <p>Beginning with release 3.5, the StorNext Windows client sets the UNIX uid, gid and mode bits only when Windows creates a file. The StorNext Windows client will no longer change the Unix uid, gid or mode bits when a Windows user changes the Windows security descriptor or Read-Only file attribute.</p> <p>If you change the UNIX mode bits and the file is accessible from Windows, you must change the Windows security descriptor (if Windows Security is configured On) or Read-Only file attribute to ensure the change is reflected on both Windows and UNIX.</p> <hr/> <p>When a StorNext file system is mounted to a drive letter or a directory, configure the Windows backup utility to NOT include the StorNext file system.</p>

Operating System / Affected Component	Description
Windows	<p>If you are using the StorNext client software with Windows Server 2003, Windows Server 2008, Windows XP, or Windows Vista, turn off the Recycle Bin in the StorNext file systems mapped on the Windows machine.</p> <p>You must disable the Recycle Bin for the drive on which a StorNext file system is mounted. Also, each occurrence of file system remapping (unmounting/mounting) will require disabling the Recycle Bin. For example, if you mount a file system on E: (and disable the Recycle Bin for that drive) and then remap the file system to F:, you must then disable the Recycle Bin on the F: drive.</p> <p>As of release 3.5, StorNext supports mounting file systems to a directory. For Windows Server 2003 and Windows XP you must disable the Recycle Bin for the root drive letter of the directory-mounted file system. (For example: For C:\MOUNT\File_System you would disable the Recycle Bin for the C: drive.) For Windows Server 2008 and Windows Vista you must disable each directory-mounted file system.</p> <p>For Windows Server 2003 or Windows XP:</p> <ol style="list-style-type: none"> 1 On the Windows client machine, right-click the Recycle Bin icon on the desktop and then click Properties. 2 Click Global. 3 Click Configure drives independently. 4 Click the Local Disk tab that corresponds to the mapped or directory-mounted file system. 5 Click the checkbox Do not move files to the Recycle Bin. Remove files immediately when deleted. 6 Click Apply, and then click OK. <p>For Windows Server 2008 and Windows Vista:</p> <ol style="list-style-type: none"> 1 On the Windows client machine, right-click the Recycle Bin icon on the desktop and then click Properties. 2 Click the General tab. 3 Select the mapped drive that corresponds to the StorNext mapped file system. For directory-mounted file systems, select the file system from the list. 4 Choose the option Do not move files to the Recycle Bin. Remove files immediately when deleted. 5 Click Apply. 6 Repeat steps 3-5 for each remaining directory-mounted file system. 7 When finished, click OK.

Operating System / Affected Component	Description
All	<p>Be aware of the following limitations regarding file systems and stripe groups:</p> <ul style="list-style-type: none"> The maximum number of disks per file system is 512 The maximum number of disks per data stripe group is 128 The maximum number of stripe groups per file system is 256 The maximum number of tape drives is 256 <hr/> <p>For managed file systems only, the maximum recommended directory capacity is 50,000 files per single directory. (This recommendation does not apply to unmanaged file systems.)</p> <hr/> <p>Quantum recommends making two or more backup copies to minimize vulnerability to data loss in the event of hardware failure.</p> <hr/> <p>The StorNext Cluster-Wide Central Control file (nss_ctl.xml) is used to enforce the cluster-wide security control on StorNext nodes (client nodes, fsm nodes, and nodes running cvadmin). This file is placed on an nss coordinator server.</p> <p>Currently the nss coordinator server capable of parsing this xml file must be on the Linux platform.</p>

Documentation

The following documents are currently available for StorNext products:

Document Number	Document Title
6-01658-12	<i>StorNext User's Guide</i>
6-00360-21	<i>StorNext Installation Guide</i>
6-01376-16	<i>StorNext File System Tuning Guide</i>
6-01620-15	<i>StorNext Upgrade Guide</i>
6-01688-12	<i>StorNext CLI Reference Guide</i>
6-00361-41	<i>StorNext File System Quick Reference Guide</i>
6-00361-42	<i>StorNext Storage Manager Quick Reference Guide</i>

Contacting Quantum

More information about StorNext is available on the Service and Support website at www.quantum.com/support. The Service and Support Website contains a collection of information, including answers to frequently asked questions (FAQs). You can also access software, firmware, and drivers through this site.

For further assistance, or if training is desired, contact Quantum:

Quantum Technical Assistance Center in the USA:	+1 800-284-5101
For additional contact information:	www.quantum.com/support
To open a Service Request:	www.quantum.com/osr

For the most updated information on Quantum Global Services, please visit: www.quantum.com/support