

Nexsan Technologies

Frequently Asked Questions – ATAboy Technology

Functionality

- Q: [What is the ATAboy?](#)
- Q: [What is the ATAboy2?](#)
- Q: [Aren't ATA drives considered less reliable than SCSI or Fibre drives?](#)
- Q: [Is ATAboy architecture based on "off the shelf" ATA chip sets?](#)
- Q: [Aren't ATA based Arrays slow?](#)
- Q: [How many drives do you support with the ATAboy?](#)
- Q: [What configurations are available?](#)
- Q: [How much cache does it support?](#)
- Q: [What Platforms are supported?](#)
- Q: [How does the Tele-guard "Phone Home" feature work?](#)
- Q: [What are the specific Teleguard capabilities?](#)
- Q: [Does the ATAboy use an embedded OS?](#)
- Q: [How do we handle block sizes?](#)
- Q: [ATA drives don't handle bad blocks, how does Nexsan deal with this?](#)
- Q: [How many LUNs are supported?](#)
- Q: [What RAID levels are supported?](#)
- Q: [Do we support Command Queuing?](#)
- Q: [Number of hosts that can be connected per controller?](#)
- Q: [Fibre Channel capability?](#)
- Q: [Fibre Channel Connectivity?](#)
- Q: [Do we support SAN-masking?](#)
- Q: [Support for iSCSI?](#)
- Q: [Do you use Master/Slave drives?](#)
- Q: [What type of connectors is used on the mid-plane?](#)
- Q: [How much power does the ATAboy use?](#)
- Q: [What can be hot swapped on it?](#)
- Q: [Are the drives "Hot Pluggable"?](#)
- Q: [How is firmware upgraded?](#)
- Q: [How is the ATAboy cooled?](#)
- Q: [What is the MTBF of the ATAboy?](#)
- Q: [Is cache backed up by battery?](#)

Product Warranty and Support

Q: [What is the warranty on the ATAboy product?](#)

Glossary

[Array](#)
[Bootable Array Support](#)
[Cache](#)
[Dynamic Array Expansion](#)
[Fault Tolerance](#)
[Hot Spare](#)
[Hot Swap](#)
[Microprocessor](#)
[Mirroring \(RAID 1\)](#)
[Online Capacity Expansion \(O.C.E.\)](#)
[Parity](#)
[RAID Levels](#)
[RAID 0](#)
[RAID 1](#)
[RAID 1+0](#)
[RAID 5](#)

Functionality

Q: What is the ATAboy?

A: ATAboy technology was a 2001 release of product from Nexsan Technologies that incorporates the advanced feature, high performance benefits of our SCSI and Fibre based arrays but at a significant cost advantage. ATAboy uses proprietary controller technology developed by Nexsan to implement lower cost ATA drives in Enterprise solutions.

Q: What is the ATAboy2?

A: ATAboy2 is our 4th generation release and is 3U, 14 disk bays. The ATAboy2F is our dual 2Gb Full fabric version. This technology also incorporates Multi-LUN, Multi-RAID capability, dual host channels per controller, and will support active-active fail over on the controller.

Q: Aren't ATA drives considered less reliable than SCSI or Fibre drives?

A: ATA drives outnumber SCSI and Fibre drives thousands to one and therefore, the manufacturers have a vested interest in maintaining a very high reliability factor with ATA drives. ATA drives generate less heat, have fewer vibration issues, and are used in tens of millions of computer systems, personal video recorders (PVR), most phone systems around the world, medical systems etc. The Maxtor and Hitachi drives Nexsan currently uses have a 1,000,000-hour MTBF. This means that in a 14 drive configuration one drive could fail every five years. Since RAID systems are redundant, this will not result in data loss and the system would automatically rebuild onto the Hot Spare drive.

Q: Is ATAboy architecture based on "off the shelf" ATA chip sets?

A: No. ATAboy is designed using our own proprietary ATA silicon on our RAID controller. Our Controller board was designed to integrate our advanced feature set from our SCSI and Fiber.

Q: Aren't ATA based Arrays slow?

A: Mostly yes, but not in the case of ATAboy. We include ultra160 host or dual 2GB Fiber interface connectivity and fourteen ATA133 channels in the new High Density unit. This continues to give the ATAboy leading edge performance. The 14-drive sustains sequential read performance of 125MB/sec using the dual 160MB USCSI or 170MB/sec with 25,000 cached IOPS using our 2Gb Fiber.

Q: How many drives do you support with the ATAboy?

A: We have eight drive and a fourteen drive models. Not all drives are required (three is a minimum).

Q: What configurations are available?

A: We provide Rack mount units (ATAboy is 4U and the ATAboy2 is 3U), 'Rack less' stack units and pedestal.

Q: How much cache does it support?

A: Up to 512MB with 128MB being standard.

Q: What Platforms are supported?

A: Just like the InfiniSAN 2 product, the ATAboy is platform independent. ATAboy design incorporates a 10/100 Ethernet connection that allows the Array to be configured, managed and viewed by any web browser with a simple logon (data is not accessible through this LAN connection). Since there is no "Platform kit" for management, the ATAboy is very easily attached to any SCSI or Fibre port.

Q: How does the Tele-guard "Phone Home" feature work?

A: Since we have intelligence built into our management component of the imbedded web browser, any administrator can configure the ATAboy or InfiniSAN units to email a user, group, cell phone or pager with not only reported failures but pre-emptive failure notifications as well. In the configuration window you simply fill in the name of your email server and a list of recipients along with what you wish to be notified of. Less savvy end-users or those under maintenance contracts can have those notifications go to either the service provider, Nexsan or the Reseller.

Q. What are the specific Teleguard capabilities?

A. Public features are:

- Embedded web server code executes as a low priority task on RAID processor.
- Environmental monitoring of fans and temperature.
- Configure and monitor subsystem using any standard web browser.
- Alerts and warnings sent out using SMTP email alerts with problem summary, hyperlink to the enclosure management page, plus user-defined fields.
- Shows status of disk drives, power supplies, fans, RAID controller. Information is automatically refreshed at a settable interval.
- Single click access to summary of all problems and warnings.
- Statistics screen shows accesses, errors, and retries for each drive.
- Event log for all significant events stored on disk.
- Supports automatic IP address assignment via DHCP, manually using IP Gleaning, over serial port (firmware 4013 or higher), or via web page.
- DNS support for symbolic addresses.
- Extra security feature requires manual confirmation of destructive media operations.

- Password required for destructive or disruptive operations.
- Build RAID sets (and set RAID level and stripe size), partition RAID sets into Volumes, map Volumes to LUNs and Host Ports, and manage Spares for each drive, complete Model Name, Capacity, Serial Number, and Firmware Revision is reported along with errors and retries, if any.
- Most screens have helpful tutorial text at the bottom
- Array is verified before being put into production; automatic "parity scrub" (array verify) is performed as a background task every 24 hours thereafter.
- Graphical progress bar shows completion percentage of RAID build or verify
- Volumes may be given "friendly names"
- Battery-backed Real Time Clock/Calendar is used to time stamp all major events
- Complete hardware status page lists all significant hardware conditions such as voltages, temperature, battery mode, cache settings, network settings, and blower RPM
- Network Statistics page shows transmitted and received packet counts
- Comprehensive Bad Block information pages report re-assigned blocks
- Cache management page allows configuration of Cache as enabled or disabled, or remotely settable via standard SCSI commands
- Network port may be configured to automatically negotiate speed, or speed and half/full duplex may be set manually
- E-Alerts may be sent on errors, or on errors and warnings

Q: Does the ATAboy use an embedded OS?

A: The ATAboy RAID controller does not use a commercial RTOS internally. Instead, it uses a custom-built scheduler package, which is optimized for the ATA RAID design. Much of the logical ATA interface is designed into the FPGA's, which essentially form an intelligent 64-bit PCI to ATA Bridge. In the case of the ATAboy (but not in our other products) the network stack runs on the same processor as the RAID logic, as a background task. The system is tweaked slightly such that even if the RAID is 100% busy, the network gets enough CPU cycles to keep the web GUI pumping.

Q: How do we handle block sizes?

A: The ATAboy only works with fixed 512 byte sectors. However, you can request any number of these in a single transfer, and host operating systems typically request 32 or more sectors at a time. We often test using 512K transfers. Note that if you are testing with Windows NT you usually have to edit the registry to make it transfer more than 32K in a single operation. The changes required depend upon the HBA you are using.

Q: ATA drives don't handle bad blocks, how does Nexsan deal with this?

A: One of the concerns of using ATA drives in "Enterprise environments" is the lack of bad block management. The innovative design of the ATAboy controllers maps and manages all bad blocks and allows, through our GUI, the administrator to view them.

Q: [How many LUNs are supported?](#)

A: ATABoy2 supports 8 LUNS per host or 16 LUNS per unit and the ATABoy2F (fiber unit) supports 16 LUNS per host or 32 LUNS per controller unit. The eight-drive 4U unit supports a single LUN.

Q: [What RAID levels are supported?](#)

A: ATABoy supports 0, 4 & 5.

Q: [Do we support Command Queuing?](#)

A: The ATABoy products support command queuing from the host in our controller design.

Q: [Number of hosts that can be connected per controller?](#)

A: The 14-drive ATABoy2 supports two hosts with daisy chaining capability. The 8-drive ATABoy supports one host channel.

Q: [Fibre Channel capability?](#)

A: We have two fibre channel host ports, which can be individually set to 1Gb, 2Gb or auto-negotiate. These two ports are completely independent. The dual controller version features four host ports. ATABoy2F supports 126 simultaneous 'login-ins'. We support reserve/release on a per-LUN basis, and this operates across all host ports.

Q: [Fibre Channel Connectivity?](#)

A: The ATABoy2F, our Fibre Channel Version, uses pluggable SFP transceivers but can accept any standard type. These SFP are short wave LC optical. Our units can be configured in fabric mode, point-to-point, or arbitrated loop and are individually configurable per host port from our GUI. The controller has one WWN with two unique port names assigned to the two ports.

Q: [Do we support SAN-masking?](#)

A: Yes

Q: [Support for iSCSI?](#)

A: Yes, our Veriture-iP "Storage Concentrator" in front of our ATABoy2 storage arrays.

Q: [Do you use Master/Slave drives?](#)

A: We only use one drive per ATA channel since we view using two in a Master/Slave environment would reduce performance, reduce reliability, and preclude hot plugging. Each disk drive has its own private bus.

Q: [What type of connectors is used on the mid-plane?](#)

A: An innovation we added to the 14 drive unit is that we have a custom-designed, unitized, disk drive docking connector which blind mates with Hitachi or Maxtor ATA drives without the use of expensive and unreliable intermediate connectors these connectors are rated at 1,500 insertions.

Q: [How much power does the ATAboy use?](#)

A: An 8-drive ATAboy is about 140 watts (200 VA or 480 BTU/hr), and a 14-drive is about 200 watts (286 VA or 683 BTU/hr).

Q: [What can be hot swapped on it?](#)

A: All the modules are hot swappable except the mid-plane which is bolted into the center of the unit. Single controller units cannot have the controller removed since there is no fail over controller to maintain operation. The ATAboy2 and 2F are designed to implement dual controllers in Q3 03.

Q: [Are the drives "Hot Pluggable"?](#)

A: Removing and inserting drives in most, if not all other, ATA arrays on the market is problematic due to the inability to power down a drive via command. Secondly, insertion or removal of an ATA drive onto a hot power bus causes power surges that can damage to any of the drives on that power bus. This is a primary reason why other ATA arrays are not considered "enterprise class". Nexsan shuts down power to a defective drive, via our patented chip technology, upon failure and does not reapply power to an inserted drive until it has been completely seated and verified as an ATA-6 drive.

Q: [How is firmware upgraded?](#)

A: Firmware can be transferred by FTP to the ATAboy. It takes about 10 minutes. Once new firmware is installed the unit needs to be rebooted to allow the firmware to be loaded in memory.

Q: [How is the ATAboy cooled?](#)

A: The 8-drive ATAboy has two huge centrifugal blowers, one in each PSU module. Air comes in the front, through the mid-plane, and out the PSU. The RAID controller has an additional fan to cool the CPU but this is mainly a precaution, as it does not get very hot. The 14-drive ATAboy has centrifugal blowers in the PSU modules, and each RAID controller has its own blower. Like the 8-drive, air flows through the mid-plane, and out the PSU and RAID modules. The ATAboy does not get very hot -- the drives dissipate about half the power of their SCSI/FC cousins.

Q: [What is the MTBF of the ATAboy?](#)

A: The overall MTBF calculation of the ATAboy is dominated by the MTBF of the blowers/fans, or about 45,000 hours. However, these are redundant

components, the failure of which does not impact operation. The MTBF of the RAID controller is at least 100,000 hours.

Q: Is cache backed up by battery?

A: Yes the battery pack is a NiMH pack made of six 1.2-volt cells, nominal 1600 mAh capacity. There is a NTC thermistor in the pack to control the charging circuit. There is also a self-healing fuse, which prevents runaway charging or discharging. The battery pack will protect the cache memory contents for at least 72 hours in the event of sudden power loss.

Product Warranty and Support

Q: What is the warranty on the ATAboy product?

A: All Nexsan Storage products come with a three-year advance replacement warranty program and 24-hour telephone assistance to our partners or end users free of charge. A 7x24 On-Site maintenance option is also available.

As our Premiere program Nexsan Technologies has developed our innovative On-Location Pre-Exchange program that our customers believe is significantly better than traditional On-Site maintenance programs.

Glossary

Array:

Two or more hard disk drives grouped together to appear as a single device to the host computer.

Bootable Array Support:

Is the ability to make computer systems boot from a RAID array instead of from a stand-alone (single) disk.

Cache:

Is a temporary, fast storage area that holds data from a slower storage device for faster access. Cache storage is normally transparent to the accessing device.

Co-processor:

Is a processor that resides on an array that relieves the host CPU from executing processor-intensive operations such as RAID 5 parity calculations and secondary RAID 1 writes.

Dynamic Array Expansion:

See "Online Capacity Expansion"

Fault Tolerance:

Is the ability of a system to continue to perform its functions even when one or more components have failed.

Hot Spare:

Are spare hard drive(s), which will automatically be used to replace the failed member of a redundant disk array.

Hot Swap:

Is the ability to remove any failed component of a disk array and replace it without bringing down the server or interrupting data operation.

Microprocessor:

Is a processor on the RAID controller, which performs all RAID management functions and therefore alleviate the requirement of the host CPU to manage those functions.

Mirroring (RAID 1):

Provides data protection by duplicating all data from one set of drives in a LUN to another set or LUN.

Online Capacity Expansion (O.C.E.):

Is a process for adding storage capacity to an existing RAID array without having to take the server offline. Also known as Dynamic Array Expansion.

Parity:

Is a form of data protection used by RAID levels 3, 4, 5 & 6 to recreate the data of a failed drive in a disk array.

RAID Levels:

Numbered 0 through 6 plus combinations therein such as RAID 1+0; often called RAID 10. RAID levels refer to different array architectures that offer various advantages in terms of data availability, cost and performance. RAID levels 1, 5 & 1+0 are the most commonly used.

RAID 0:

Spreads data evenly over multiple drives to enhance performance. Because there is no redundancy scheme, it does not provide data protection.

RAID 1:

See "Mirroring"

RAID 1+0:

Combines RAID 0 (data striping) and RAID 1 (disk mirroring).

RAID 5:

Combines data striping (for enhanced performance) with distributed parity (for data protection) to provide a recovery path in case of failure.