

SATABoy® SASBoy SASBeast® SASBeast SATABeast® Xi NXS-B60E

Software Manual For all SAS & SATA Storage Products

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About this Software Manual

Important information in this manual appears as:

NOTES – Notes contain important information and useful tips on the operation of Nexsan Disk Storage Products.

CAUTIONS – A Caution must be observed to avoid damage to the equipment.

 $\label{eq:WARNINGS-Warnings} \text{ warnings must be followed carefully to avoid personal injury.}$

All information within this manual is correct at the time of print. Nexsan Technologies is constantly working on new features. As a result, new firmware may be available. Please contact Nexsan Technical Support to check for the latest revision.

NOTE – Nexsan firmware follows a convention whereby a 4-character version number is used. The first character denotes a storage product's controller – 4=ATABoy2S, 5=ATABoy2F, 8=ATABeast, 9=SATABlade, A=ATABoy2x, B=SATABoy, C=SATABeast, D=SATABoy-SCSI, G=SATABeast (4G), H=SATABoy2/SASBoy, K=SATABeast Xi, L=SATABoy2-SH, N=SATABeast2/SASBeast and P=SATABeast 2.5. Note that in newer versions of firmware version Kxxx was merged with Nxxx. This means SATABeast2 and SATABeast Xi now run the same Nxxx firmware. The second digit is a letter representing a bug-fix release letter (e.g. "b" being newer than "a", and the last two digits represent major and minor feature release versions. Major feature versions are often referred to as (e.g.) "6-series" code, where in this case the 6 is the third character of firmware release's filename. File made available for upgrade are usually in the form of a "ZIP" file, and can be found on Nexsan's website, or through Tech Support.

Errata

This version of the Manual covers new AutoMAID features. There is now a new button that appears on the left hand side of the GUI called "Power Settings" that was not present in older firmware and the System Admin options no longer show AutoMAID tab. Some screenshots in this manual may not show this new button.

For Your Own Safety

In the interest of your own safety and perfect performance of your new product and computer system please note the following:

Computer components and disk drives are sensitive to static charge. Take precautions to earth any electrostatic charge from your person before and while handling the components with your hands or any tools. Please use the anti-static wrist-strap shipped with your storage product.

Ensure correct lifting methods are used when handling your storage product. Special care should be taken when removing the unit from its packaging and positioning it to the required location.

When installing storage units as rack-mounted components, ensure that all Nexsan-supplied mounting fixtures are secure. Do not mount units exclusively by the front ears. All bolts and screws should be fully tightened. Failure to comply with this may result in the unit not being fully supported in the rack and could lead to the product dropping out of the rack or falling onto other rack components.

WARNING – ENSURE THAT THE RACK IS SUFFICIENTLY STABLE BY HAVING WALL ANCHORS OR STABILISING LEGS. THIS IS ESPECIALLY IMPORTANT FOR SATABEAST.

WARNING – ALWAYS USE THE SUPPLIED IEC POWER CORDS.

WARNING – OWING TO THERE BEING MULTIPLE POWER CONNECTIONS, YOU MUST REMOVE ALL POWER LEADS TO COMPLETELY ISOLATE THE POWER.

CAUTION – FOR EMR COMPLIANCE, USE FERRITES, IF SUPPLIED.

CAUTION – RISK OF EXPLOSION IF BATTERY IS REPLACED BY INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS PRINTED ON THEM OR IN COMPLIANCE WITH YOUR LOCAL REGULATIONS.

Short Product Description

NOTE – The terms SATABoy and SATABeast are used throughout this manual and in the products' GUIs as generic names for Nexsan's 14 drive and 42 drive storage units. Variants of the controllers used in these products cover Fibre and SAS host interfaces, and controllers designated as "SATABoy2" and "SATABeast2" also support SATA and SAS disk drives. This manual also covers "Xi" variants of the products for use in Apple environments, and the drive expansion unit known as "NXS-B60E".

The SATABeast/SASBeast, SASBoy/SATABoy and NXS-B60E products represent the next generation of high speed, high-capacity disk storage subsystems from Nexsan Technologies. The SATABeast holds a maximum of 42 drives in 4U of rack space and the SATABoy has 14 drives in 3U, both offering unparalleled performance and quality in RAID subsystems. The NXS-B60E holds 60 drives, in 3 "disk modules" of 20 drives in each drawer.

SATABeast and SATABoy high-availability features:

- All main hardware components of SATABeast and SATABoy are pluggable; these include Power Supply Units (PSUs), RAID controller(s) and disks.
- Firmware upgrades can be achieved without loss of access.
- A number of user-selectable failover modes are provided that allow the user to choose between host-based multi-pathing solutions, or simple Active-Passive/Passive-Active operation, through to dual or single controller non-redundant modes.

GUI

SATABeast and SATABoy are configurable through Nexsan's unique Web-based GUI tool. The web interface uses standard HTML and is compatible with all mainstream browsers (Internet Explorer, Netscape, Opera, Mozilla, Firefox, Safari etc) which are not hardware, software or Java[™] runtime specific. Nexsan recommends use of the Storage Manager tool for discovery and setup of the equipment.

Host interfaces

SATABeast and SATABoy provide 2x Fiber Channel and 2x 1G iSCSI ports per controller which can be used simultaneously. Some versions have 2x 12G SAS ports and 2x 1G iSCSI ports per controller. Depending on the model you have, the Fibre ports may be 2G or 4G. More recent units have standardized on 4G ports, while the SATABeast 2.5 controller runs Fiber Channel at 8Gb/s and has SAS-based expansion ports.

The products have a sophisticated Host Access Control List mechanism that replaces the older "LUN Masking" system, and xx66 software introduces a new GUI SSL feature for improved security.

AutoMAID Power Saving

Depending on disk drive make and model, up to 3 power-saving modes can be deployed using "Auto-MAID"™. This is done on a per-disk basis, and power savings in some environments are around 50%, and Nexsan recommends you use this feature.

Disk Drives

SASBeast, SASBoy and the NXS-B60E have the ability to mix SATA and SAS drives in a single enclosure. All Nexsan supplied disk drives are fully pre-qualified for use in the system and each shipped drive will have undergone stringent burn-in and quality testing.

Getting Started

The user must first read the relevant Hardware Manuals in order to safely install the unit. This Software Manual assumes that the user has already identified the physical features of their product, such as LEDs, communications ports and the location of major physical subsystems.

Since the SATABeast and SATABoy and variants have a common Operating System and almost identical software features, this manual is appropriate for both systems. Note that screenshots in this manual vary between SATABeast and SATABoy and may not precisely match the GUI for the product you are using. Newer firmware revisions may also affect the features and the GUI layouts.

This manual covers most of the features that can be accessed through the product's web-based GUI, but not all the features need to be setup, or indeed understood, to get the product up and running well enough for most environments.

Basic Setup Procedure

Note that units are shipped, unless to special order, with the following defaults:

- SATABeast has 4-off 10-disk arrays and 2 pool spares.
- SATABoy with a single controller has 1-off 13-disk array, and one pool spare,
- Dual-controller SATABoys have 1-off 7-disk array, 1-off 6-disk array and one pool spare.
- NXS-B60E has no pre-defined RAID configuration.

Take the following steps to get a storage system with your desired RAID and LUN mapping setup:

Set up initial IP access to the unit in order to be able to control it through a browser.

• See "Initial Network Address Setup".

Access the target unit via your browser and notice that a checklist is presented in the GUI. This is designed to show which setup steps have or haven't been completed.

See "<u>Quickstart Configuration Checklist</u>".

Set up detailed network configuration to ensure proper IP connectivity,

See "<u>Configure Network</u>".

Set up time and date in order to ensure events are recorded at the correct time in case problems occur.

• See "Date and Time Settings".

Set up RAID sets using QuickStart if you wish to alter the default RAID settings.

• See "QuickStart".

If an array must to be set up differently to the default (e.g. more volumes per array, setting a different RAID type, or stripe size) go to the Configure RAID pages, and do this manually.

• See "Configure RAID".

Finally, configure which volumes map to which LUNs and setup which hosts have access (e.g. read/write or read-only) to the volumes that have been created.

• See "Configure Volumes".

Initial Network Address Setup

Before you can configure the storage unit via its web interface, you need to set up its IP address. SATABoy and SATABeast controllers ship with a default IP address depending on the slot it is inserted to.

Slot	Default IP Address
0 (top)	10.11.12.13
1 (bottom)	10.11.12.14

It is likely that this address may not be accessible, depending on the IP configuration of your network. To change the IP address there are three main methods;

- Use the Nexsan IP Configuration Tool which can be found on the Manual CD. The tool can also be obtained from the Nexsan website or from Nexsan Technical Support.
- Add a route to access the desired IP address.
- Use the serial port to change the IP address to something suitable.

All methods are acceptable.

NOTE – The GUI has IP connectivity on Net Port 0 only. iSCSI capability is however available on both network ports.

NOTE – Some configuration can be done in the Serial Port, but we always recommend using the web interface. The serial port is likely to have reduced functionality in future firmware.

1) Use of the Nexsan IP Configuration Tool or Storage Manager (Recommended)

The Nexsan IP Tool is a small GUI-based tool that runs under various Windows systems. The tool is available on the CD included with the product. Alternatively, you can obtain and install the tool from the Nexsan website or by calling Technical Support.

The tool works by issuing discovery packets on the local LAN segment, and all Nexsan devices running xx60 firmware or higher will respond to these packets. It can also scan IP address ranges to discover Nexsan storage devices. All discovered units will be listed in the main panel of the tool and the user can setup the desired IP address in each unit. Once this is done, there is no further need to run the tool; all other configuration is done through the web GUI.

The tool is small and self-explanatory but also comes with help information. For storage units that are newly introduced to your network, the IP Tool will show the following:

🔗 Nexsan IP Configurat	tion Tool	1			×
File Help					
RAID Systems:					
S System Name		System ID	Firmware	IP Address	
Blue SATAReast #1		01774196	Ca61 (bota)	172 16 0 140 172 16 0 141	E
Blue SATABeast #1		01784209	Caol (Deta)	172.16.0.140, 172.16.0.141	
BLUE SATABOV #2		015810CD	Bn60	172.16.8.92. 172.16.8.93	
BLUE SATABoy #3		015B130A	Ba61 (beta)	172, 16, 8, 94	
John's SATABeast		0175408C	Ga61 (beta)	172.16.3.20, 172.16.3.22	
Nexsan SATABoy		00731183	Ba61 (beta)	172.16.8.101	
Nexsan SATABoy		01FF00AA	Ba61 (beta)	172.16.8.100	-
A DED CATABoant #2		01641600	CmEO (hota)	170 12 0 114 170 12 0 115	•
Syst URL Con Assi	new Nexsan F ou wish to cor	AID system ha	s been detected on t	es <u>N</u> o	
IP Address			IP Address		
Subnet Mask			Subnet Mask		
Gateway			Gateway		
Primary DNS			Primary DNS		
Secondary DNS			Secondary DNS	5	
Сору Но	st Settings		Reset	Apply Changes	

Click on "Yes" to continue and set up the IP parameters on your SATABeast or SATABoy. See below for an example of a unit that is being set up. Complete filling in the required settings (in orange text),

🔗 Nexsan IP Configurat	ion Tool				x
File Help					
RAID Systems:					
S System Name		System ID	Firmware	IP Address	*
John's SATABoy		01111026	Ba61 (beta)	172.16.3.10, 172.16.3.12	-
Nexsan SATABeast		017640C8	Ga61	10.11.12.13, 10.11.12.14	
Nexsan SATABeast		01814673	Ga61 (beta)	172.16.8.132	
Nexsan SATABeast		027942EC	Cn60	172.16.10.70	-
Nexsan SATABoy		01761C32	Bn60	172.16.8.204, 172.16.8.205	
Nexsan SATABoy		01791D38	Ba61 (beta)	172.16.8.95	
Nexsan SATABoyS		01641001	Da61 (beta)	172.16.8.105	-
Movern CATABouC		0100014	Daci (bata)	170 12 0 104	
Status: IP NOT System ID: 017640 URL: http://1	SET C8 (SATABeast) 0.11.12.13			Beacon	
Controller 0 Net 0 Assign IP address:	 Use DHCP Use Static IP 		-Controller 1 Net 0 Assign IP address	 Use DHCP Use Static IP 	
IP Address	172 . 16 .	8 . 142	IP Address	10 . 11 . 12 . 14	
Subnet Mask	255 . 255 .	0.0	Subnet Mask	255 . 0 . 0 . 0	
Gateway	172 . 16 .	1 . 1	Gateway		
Primary DNS	172 . 16 .	1.2	Primary DNS		
Secondary DNS	172 . 16 .	1 . 13	Secondary DN	IS · · ·	
Сору Но	st Settings	Rese	et	Apply Changes	

When complete, you'll see something similar to the following, and you can click on the URL link to launch a browser session to your unit:

S System Name		System ID	Firmware	IP Address
Internal I T SATAR	aact 1 - Drima	01764059	Cm60	172 16 10 222 172 16 10 223
Internal I T SATABE Internal I T SATABE	east 2 - Seco	0176410E	Gm60	172.16.10.222, 172.10.10.223
Nexsan SATABeast	ust 2 Secon	017640C8	Ga61	172, 16, 8, 142, 172, 16, 8, 143
Nexsan SATABeast		017842DA	Ga61 (beta)	172.16.8.130, 172.16.8.131
Nexsan SATABoy		01571061	Ba61 (dev)	172.16.8.200, 172.16.8.201
YELLOW SATABeas	t #1	01008086	Ga61 (beta)	172.16.8.192, 172.16.8.193
YELLOW SATABeas	t #3	017842D6	Gn60	172.16.8.196, 172.16.8.197
RAID System System: Nexsa Status: OK System ID: 017640 URL: http://	n SATABeast 0C8 (SATABeast) 172. 16.8. 142			Beacon
RAID System System: Nexsa Status: OK System ID: 017640 URL: http:// Controller 0 Net 0 Assign IP address:	n SATABeast DC8 (SATABeast) 172.16.8,142		Controller 1 Net 0 Assign IP address	Beacon
RAID System System: Nexsa Status: OK System ID: 017640 URL: http:// Controller 0 Net 0 Assign IP address:	n SATABeast DC8 (SATABeast) 172. 16.8. 142 Use DHCP O Use Static IP		Controller 1 Net 0 Assign IP address	Beacon : Ouse DHCP Ouse Static IP
RAID System System: Nexsa Status: OK System ID: 017640 URL: http:// Controller 0 Net 0 Assign IP address: IP Address	n SATABeast DC8 (SATABeast) 172. 16.8. 142 Use DHCP Use Static IP 172. 16 .	8 . 142	Controller 1 Net 0 Assign IP address IP Address	Beacon O Use DHCP Image: Use Static IP 172 . 16 . 8 . 143
RAID System System: Nexsa Status: OK System ID: 017640 URL: http:// Controller 0 Net 0 Assign IP address: IP Address Subnet Mask	n SATABeast DC8 (SATABeast) 172. 16.8. 142 O Use DHCP O Use Static IP 172. 16. 255. 255.	8 . 142 0 . 0	Controller 1 Net 0 Assign IP address IP Address Subnet Mask	Beacon Use DHCP Ise Static IP 172 . 16 . 8 . 143 255 . 255 . 0 . 0
RAID System System: Nexsa Status: OK System ID: 017640 URL: http:// Controller 0 Net 0 Assign IP address: IP Address Subnet Mask Gateway	n SATABeast DC8 (SATABeast) 172. 16.8. 142 Use DHCP Use Static IP 172. 16 . 255. 255. 172. 16 .	8 . 142 0 . 0 1 . 1	Controller 1 Net 0 Assign IP address IP Address Subnet Mask Gateway	Beacon Ise DHCP Ise Static IP 172 . 16 . 8 . 143 255 . 255 . 0 . 0 172 . 16 . 1 . 1
RAID System System: Nexsa Status: OK System ID: 017640 URL: http:// Controller 0 Net 0 Assign IP address: IP Address Subnet Mask Gateway Primary DNS	n SATABeast DC8 (SATABeast) 172. 16.8. 142 O Use DHCP O Use Static IP 172. 16. 255. 255. 172. 16. 172. 16.	8 . 142 0 . 0 1 . 1 1 . 2	Controller 1 Net 0 Assign IP address IP Address Subnet Mask Gateway Primary DNS	Beacon Use DHCP Ise Static IP 172 . 16 . 8 . 143 255 . 255 . 0 . 0 172 . 16 . 1 . 1 172 . 16 . 1 . 2

2) Add a route to access the desired IP address

To add a route to access the desired IP address you must have access to the CLI (command line interface) or a shell window / terminal. Type the following line, according to your OS to add the route: **Windows:** route add 10.11.12.13 mask 255.255.255.255 </ **Workstation IP number> Linux:** /sbin/route add 10.11.12.13 mask 255.255.255.255

Solaris:
route add 10.11.12.13 mask 255.255.255.255

Replace <Workstation IP number> with the IP address of the workstation you are using.

To add a route for the controller in Slot 1 you will need to change the "route add" IP address to 10.11.12.14

3) Use the serial port to change the IP address

Alternatively, you can use the serial port of your computer, sometimes known as a COM port, with the supplied DB9 cable. This cable is known as a null modem cable, unlike a straight-through cable a null modem cable has lines 2 and 3 crossed. The serial port functionality is subject to change and should not be used for scripted control mechanisms.

The instructions below are for using Hyper Terminal. Alternatively, you can use any terminal emulation program.

NOTE – Hyper Terminal is not now supplied with MS Windows. It may be downloaded free from Hillgrave.

First, ensure that the serial cable is connected to the storage unit and to an available serial port on your computer. Open Hyper Terminal and choose to create a new connection. Name the connection "SATABeast" or some other identifiable name. Then click "OK" to progress to the next dialogue box.

Connection Description	? ×
New Connection	
Enter a name and choose an icon for the connectio	n:
Name:	
SATABeast	
Icon:	
N 📚 🧇 🖳 🍪 🕻	2
ОК	Cancel

Select the computer's COM port that has the serial cable inserted and click "OK" to continue.

Connect To	<u>? ×</u>
🧞 SATABe	past
Enter details for	the phone number that you want to dial:
Country/region:	United States (1)
Area code:	01332
Phone number:	
Connect using:	COM1
	OK Cancel

Choose 115200 bits per second, 8 data bits, 1 stop bit, no parity bits and set Flow control to "None", then click "OK" to connect.

COM1 Properties			<u>?</u> ×
Port Settings			
			_
Bits per second:	115200	•	
Data bits:	8	•	
Parity:	None	•	
Stop bits:	1	•	
Flow control:	None	•	
		Restore Defaults	 ;
0	K Cano	cel Ap	ply

Now that the port is connected you may need to press the return key or Ctrl+R to activate the serial port interface. You should then see the following screen:

SATABeast system	management	console	(c) Nexsan	Technologies	ALL OK
Main Menu					
Information Configure RAID Configure volumes Configure fibre Configure iSCSI Configure network Configure cache Configure E - alerts Configure SNMP System admin					
11:32:31 Pr 'Cntrl R' - Ref	ess 'returi resh, 'Cnti	n'to ope -1 A'– F	en a new mer NSI/VT100,	nu 28-F 'Cntrl B' - Colour	eb-2007_

The serial port menu system can easily be navigated using the cursor (arrow) buttons on your keyboard. There are also some special functions that are listed at the bottom of the terminal screen such as Ctrl+R to refresh the screen. There are also options to switch between ANSI and VT100 modes and to toggle between black and white and colour.

To edit the network configuration, use the cursor keys to select the "Configure network" option and press return

Main M	enu
Information	AID
Configure R	olumes
Configure v	ibre
Configure f	SCSI
Configure i	etwork
Configure n	ache
Configure C	- alerts
Configure S	NMP
System admi	n

Then select "Set static IP address" and press return.

Type in the desired IP address in the input box.

Enter the netwo	⁻k IP	address	for	the	GUI
>172.16 .1 .21)				

Press return. Now the new IP address is saved. Select the "Apply new settings" option or reboot the unit for the change to take effect.

Connecting Your Web Browser with the Storage Unit

After the initial IP address has been set up in the unit, you will be able to use the web interface to continue the configuration of the system. You must type the IP address of the unit into your Internet Browser (i.e. Microsoft Internet Explorer or Netscape Communicator).

🗿 Co	pyrigl	ht Nexs	an Technol	ogies - Micros	soft Interne
File	Edit	View	Favorites	Tools Help	
ф Ва	ack 🔻	÷ -	🗵 🗹	Q Search	🙀 Favorite
Addre	ess 🗌	10.11.	12.13		

When you press return or click the GO button in the browser, it should load the unit's login page shown below (graphics may vary slightly depending the firmware version). You will need to click the login button to continue; by default there is no username, nor password.



NOTE – If you use Storage Manager, this page is skipped. On an uninitialized unit you will see the "Quickstart Configuration Checklist" as the first page.

After clicking on the "Click Here To Login" button, you will see the "<u>Quickstart Configuration Checklist</u>" as the first page on an uninitialized unit. Thereafter, when logging in, the product's Home Page will load – see "<u>Home Page</u>".

GUI Menu Structure Details

Introduction

The MAIN MENU, located to the left hand side of each displayed page, is the initial access point to every other page within the GUI system. Selecting RAID INFORMATION, the second example shown below, will by default show the RAID ARRAY page (the first tab) with all the Access Tabs to each subsequent page within the RAID INFORMATION area also shown at the top of that page.

Each title of the MAIN MENU is shown below with its relevant Tabs. Once a section from the MAIN MENU has been selected, any one of its tabs may then be selected. Note that the sections of the MAIN MENU entitled HOME and LOG OFF have no tabs associated with them. Most pages (selected via a tab) are described within the main body of this manual.

Please look through the following screenshots taken from a SATABeast unit, in order to familiarize yourself with the general layout of the GUI.

Quickstart Configuration Checklist

Normally this is the first page you see when accessing an uninitialized SATABeast or SATABoy unit, after you login. The page reminds you to set up the following things:

- Set an admin password for security.
- Set up a friendly name for the system.
- Configure Network settings.

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- Configure RAID arrays.
- Configure Volumes.

Storage Manager - [Nexsan]	n RAID Storage\Fa	avorites\SATABeast]		
File Action View Help				
🗢 🔿 🙋 🖬 🚺 🖬				
nexsan	A		6	ALL OK
Home		Check		
RAID Information	Basic Ex	pert List		
System Information			Quick Start	t
Configure RAID			onfiguration Ch	ecklist
Configure Volumes			A nexs	an
Config Host Access			TICHNO	LOGIES
System Admin		S	ΔΤΔΒε	pact
Configure Network				
Quick Start 🛛 🕞				E
Technical Support	Welcome t	to the Nexsan SATABeast. This c	hecklist will help yo	u to correctly set up your RAID system.
Log Off	To hide th	is checklist in the future, unsele	ct 'Show the configu	uration checklist on home page' at the bottom
	and click	Close Checklist. The checklist v	viii aiways remain av	valiable via the Quick Start menu on the left.
			Cocurity/	
		Current 'ADMIN' password re	auirement	Not required
		Current 'USER' password req	uirement	Not required
	!	It is recommended that you as unauthorised changes.	sign an 'ADMIN' pas:	sword to protect the RAID system against
			Change Secur	nty Settings
			System Name	e
		RAID system name		SATABeast
	1	It is recommended that you as: identify the system in e-alerts,	sign a friendly name the web CUI, and m	to each RAID system. This name is used to anagement applications.
			Set System	n Name
			Network Setting	gs
		Controller 0 - Net 0 port state	us	Link Up, IP address 172.16.8.142
		Controller 1 - Net 0 port stat	us	Link Up, Ir address 1/2.16.8.143
		It is recommended that you co	nnect the manageme	ent network port (Net 0) of both controllers to

The page shown has already had some items setup – the first time through, you will have several items that need attention. Scrolling further down the page, you can see information about whether you have configured arrays and volumes or not.

🛞 Storage Manager - [Nexsan RAID) Storage\Fa	avorites\SATABeast]		x		
File Action View Help						
🗢 🔿 🖄 🖬 🚺 🖬						
nexsan			<u> </u>	<u>L OK</u>		
Home		Net	work Settings	*		
RAID Information		Controller 0 - Net 0 port status	Link Up, IP address 172.16.8.142			
System Information		Controller 1 - Net 0 port status	Link Up, IP address 172.16.8.143			
Configure RAID		It is recommended that you connect th	ne management network port (Net 0) of both controllers to			
Configure Volumes		your network and assign a valid IP add	ress, netmask, and gateway.			
Config Host Access		(Change Network Settings			
System Admin						
Configure Network						
Quick Start 🕞		Arra	Y Configuration			
Technical Support		Configured RAID arrays	1 x 9-disk RAID5, 1999.9 GB			
Log Off	√	If the array configuration above does not suit your requirements, you can select an alternate configuration by clicking the button below. To configure the RAID manually, use the 'Configure RAID' link on the left.				
		CI	nange Array Configuration			
		Volume Cor	figuration and Access			
		Configured volumes	1 x 1100.0 GB (Fibre) 2 x 2199.0 GB (Fibre) 1 x 50.9 GB (Fibre)			
		Volume mapping scheme	Non-redundant			
		Volume access control	Restricted access			
		If the volume configuration above does not suit your requirements, you can change the volume mapping and access control by clicking the button below. To add or delete volumes, use the 'Configure Volumes' link on the left.				
		\Box Show the config	uration checklist on home page			
		C	ose Checklist			
				-		

Note that at the bottom of the page, you can choose whether you want to see the checklist again.

To learn more about QuickStart, see the section "QuickStart".

Home Page

Home Page with "All OK" Status

The Home Page provides a quick summary of the state of your storage unit, including environmental readings such as temperatures, fan status and PSU voltages. Basically, if everything working correctly, you'll see a green tick in the top right corner. If there are problems requiring your attention, you'll see a red "failure" cross – see "Home Page with "Failure" Status". Note that for a SATABeast 2.5 system connected to an NXS-B60E unit, you will see the "enclosure view" on the home page, and you can choose which physical enclosure to view in detail by clicking on it.



Home Page with "Failure" Status

In the event of any failures, a typical system could look like this, with red graphics and text:

NOTE - The problem is because of a failed disk, shown in the screenshot after the one below.



The alarm will sound, but it can be silenced by pressing the "Silence Alarm" button. You can check the details of the problem by either pressing the "Problem Summary" button on the page above, or by pressing the red cross graphic or FAILURE text at the top right.

NOTE - If you silence the alarm, then you'll see message confirming the alarm has stopped, and then by pressing the "Back" button, you'll return to page above.

For a SATABeast 2.5 system connected to an NXS-B60E unit, you will see the enclosure view on the home page as shown below:



If you chose to check the details of the problem, the following page will appear and will summarize every problem. Note the example below is still showing the option to silence the alarm, but these buttons disappear if the alarm has previously been silenced.

😭 Storage Manager - [Nexsa	n RAID Storage\Other Systems\Orange SATABeast #1]
File Action View Help	
🗢 🄿 🖄 🖬 🚺 🖬	
e nexsan	A
Home	System Enviro Network Network Network
RAID Information	Info Info Info Services Stats Problems Log View Key
System Information 🕟	Summary of System Problems
Configure RAID	
Configure Volumes	
Config Host Access	
Power Settings	Number Description
System Admin	1 RAID array#2 on controller 1 is in a critical / degraded state
Configure Network	Beacon
Quick Start	
Log Off	
	Help Clicking on the Beacon button will cause the front panel leds to flash green for one minute.
	Note - the audible alarm is sounding due to at least one problem.
	Problem Summary Silence Alarm

In the event of unexpected or inexplicable failures, contact Nexsan Technical Support or your reseller.

RAID Information

RAID Array Information

This page shows a summary for each array that has been set up, even if the array is not fully constructed. If an array is working correctly, then a graphic showing a stack of disk drives with a green bar, will be displayed. An array may be in other states, such as "Reconstructing" following a problem, in which case a flashing icon will be shown.

NOTE – This screenshot shows a typical RAID configuration, but is not necessarily what the user first sees on a new unit.



The information displayed is as follows:

Array name - User defined friendly label for the array.

Array number – Friendly reference number, normally given in order of creation.

Configured owner – Displays the configured owner controller of the RAID array.

Current owner – Displays the current owner of the RAID array, this may be different from the configured owner if a controller has failed.

Array status / health – Current health status – Fault Tolerant, Not Fault Tolerant, Critical or Offline.

RAID level – Displays the RAID level of the array.

Array capacity – Displays the array's usable size in GBytes.

No. of members – Displays the number of disks in the array.

No. of spares – Displays the total number of spares available for the array.

No. of volumes – Displays the total number of configured volumes on this array.

Data stripe size – Displays the stripe size for the array.

Write cache – Displays if write cache is enabled or not, and FUA status.

Write cache size – Displays the amount of write cache available.

Rebuild priority – Displays the user definable rebuild rate.

Verify utility - Display the user-set disk verification tests that will run, and how often they run.

Verify due – Displays when the next verification will be performed.

Number of reads – Displays number of reads from the array.

Number of writes – Displays number of writes to the array.

Created – Displays the date and time that the array was created.

Progress

The progress page shows the progress of active RAID array utilities.

Storage Manager - [Nexsan	RAID Storage\Other Systems\YELLOW SATABeast #1]	
File Action View Help		
🗢 🄿 🖄 📰 🚺 🖬		
nexsan		
Home	RAID Array Progress Volumes Disk Disk Fibre iSCSI Host Drives Stats Info Info Stats	System Nav
System Information	RAID Information RAID Array Utility Progress	?
Configure RAID		
Configure Volumes	Arrav #1	
Config Host Access	Array number : 1, Controller 0	
Power Settings	Utility -	
System Admin		
Configure Network	0%	100%
Quick Start		
Technical Support	Array #2	
Log Off	Array number : 2, Controller 1	
	Progress % -	
	0%	100%
	Help	
	Note - if web page auto refresh is not enabled, you will need the page or click <u>here</u> to see the current status.	to refresh

The progress of the following processes can be viewed at this page:

- Array Construct (create).
- Array Reconstruct (rebuild).
- Surface Scan.
- Parity Scrub.

The page below shows the progress of an array (Array #4) that is being rebuilt after a disk failure:

Storage Manager - [Nexsan RAIL	Storage\Favorites\SATABeast]		
File Action View Help			
🗢 🔿 🖄 🖬 🚺 🖬			
			FAILURE
Home	Progress %	-	A
RAID Information	0%	100%	5
System Information			
Configure RAID		Array #2	
Configure Volumes	Array	number : 3, Controller 0	
Config Host Access	Utility	-	
System Admin	Progress %	-	
Configure Network	0%	100%	6
Quick Start			
Technical Support			
Log Off	Array	Array #4 number : 4, Controller 1	
	Utility	Array reconstruct	
	Progress %	30%	
	09/	100%	
	0%	100%	
		Help	
	Note – if web page auto refres or click <u>here</u> to see the curren	h is not enabled, you will need to refresh t status.	the page

Volumes

The Volumes page displays the configured volumes for each array.



Clicking the "Next" arrow in the table will display the following page to reveal more information about a particular volume, such as LUN mapping and host access to the volumes. Click on the left-pointing arrow on the top left of the page to return to the main Volumes page.

😭 Storage Manager - [Nexsar	n RAID Storage\C	Ither Systems\YE	LLOW SATABeast #	1]				
File Action View Help								
🗢 🔿 🖄 🖬 🚺 🗊								
nexsan	R							VALL O
Home	PAID		Dick Di	- k	Fibra i	5C51 Ha	ct 51	(stom
RAID Information 🔹 🕨	Array	gress Volume	S Drives St	its	Info	Info Sta	its I	Nav
System Information	¢		RAID	Inte	ormation gical Vol	umes		
Configure RAID			comgure		gical voi	unics		<u>Next ></u>
Configure Volumes				_				
Config Host Access		Volume LUN	I Mapping		Fil 9 Host 0	0 Host 1	Net	ISCSI
Power Settings		1: 'Volume #	1'		• Host o	• nost 1		
System Admin		Array: 'Array	#1' ,	CU	LUN 0	LUN 0		
Configure Network		Capacity: 2.3	BTB (2212.0	C1	LUN 0	LUN 0		
	G	iB)						
Quick Start	Туре			Hos	t			Access
Technical Support								
Log Off		Default Acc	ess (default be	ehavio	our for new	initiators)		None
			Crew	120	D Cuultabl			
	- Fibro	Host 'Host #	Grou ≢14 (Fibre) WW	PN: 2	1-00-00-E)-8B-1E-70	-E4	Road/Write
		win2008 104	1'					Ready Write
			0	ther	Hosts			
	0 iSCSI	Host #1 (iS	- CSI) iqn.1991-0	5.cor	n.microsoft	:nexsan-z8i	iazxgj	None
	● iSCSI	Host #2 (iS	CSI) iqn.1991-0	5.cor	n.microsoft	:dvt06-		None
	iscsi	5201zdwc1 Host #3 (iS0	CSI) ian.1991-0	5.cor	n.microsoft	:kev-nc		None
	0 iSCSI	Host #4 (iSt	CSI) iqn.1991-0	5.cor	n.microsoft	:super-serv	/er	None
	● iSCSI	Host #5 (iS	CSI) iqn.com.ibi	n.isto	szx1g205.	hostid.09ba	af54f]	None
	0 iSCSI	Host #6 (iS	CSI) iqn.com.ibi	n.isto	szx1g205.	hostid.09ba	af54f	None
	● iSCSI	Host #7 (iS	CSI) iqn.2005-0	3.cor	n.redhat:01	a27be8f82	24b0	None
	0 iSCSI	Host #8 (iS	CSI) iqn.1991-0	5.cor	n.microsoft	:d9vszjc1		None
	0 iSCSI	Host #9 (iSo	CSI) iqn.1996-0	4.de.	suse:01:ae	d39b25ae7	b	None
	0 iSCSI	Host #10 (is	5CSI) iqn.1996-	04.de	e.suse:01:b	886967a4d	3a	None
	0 iSCSI	Host #11 (is	5CSI) iqn.1991-	05.co	om.microsof	t:win-eqr0	pia3nr2	None
	● Fibre	Host #12 (F	ibre) WWPN: 21	-FC-	00-C0-DD-	03-DD-EC		None
	♥ Fibre	Host #13 (F	ibre) WWPN: 2	L-03-	00-E0-8B-7	/E-70-E4		None

Clicking Next or Previous will allow you to view the details for each volume. Click on the left-pointing arrow on the top left of the page to return to the main Volumes page.

The main Volumes page also offers these links:

- Click here to view volume access summary.
- Click here to view detailed volume layout.

See below for further information.

Volume Access Summary

If you select "Volume Access Summary", you can see a summary of which hosts have access to each of the mapped volumes.



Scrolling down the page reveals the following legend:

Storage Manager - [Nexsan RAI	D Storage\Other Systems	s\YELLOW SATABeast #1]	
File Action View Help			
🗢 🔿 🔁 🖬 🚺 🖬			
nexsan			ALL OK
Home			^
RAID Information		Help	
Confirme BAID		_	
Configure RAID	The icons abov	e indicate what access a given host has to a given volume	
Configure Volumes	Hover the mound	se cursor over an icon to see a tooltip with additional	
Config Host Access			_
Power Settings	Icon	Description	
System Admin		Access denied	
Configure Network	•	Read/Write access	
Quick Start	•	Read/Write access, but the host is not connected to a port with a LUN mapped to that volume	
Log Off	0	Read/Write access, but the host is currently not connected or offline	
	Θ	Read Only access	
	Θ	Read Only access, but the host is not connected to a port with a LUN mapped to that volume	t 🗉
	۲	Read Only access, but the host is currently not connected or offline	1
			Ψ.

Detailed Volume Layout

The example below shows a volume in the array that is using 25% of the free space. If not all of the array has been mapped to a volume, you can create more volumes on the array.



The top section of the page shows the capacity information regarding "Array #1". Beneath this is the volume information.

The information displayed is as follows:

Volume name Volume capacity	 User defined friendly name for the volume. Capacity of the volume, in brackets the binary size of the volume is also shown.
% of total array used	- Displays the percentage of the entire capacity of the array that this volume uses.
Number of bad blocks	- Displays the number of blocks on the array that cannot be read or written owing to
media issues.	
LUN mapping	 Clicking the link shows the LUN masking properties of this volume.
Volume serial number specialist SCSI tasks.	 Displays the volume serial number. This information may be required for some
Volume created	 Displays the time and date that the volume was created.

Disk Drives

The Disk Drives page shows all the disks in the system and all useful information about each disk.



The information displayed is as follows:

Status – Displays the array the disk belongs to and the AutoMAID status of the disk.

Model – Displays the manufacturer's model number for the disk drive.

Capacity - Displays the raw capacity of the disk drive.

Serial Number – Displays the serial number of the drive.

Firmware – Displays the current firmware level of the drive.

NOTE – When in active-active mode the owner controller number will be shown for each disk, for example (C0) means the disk belongs to controller 0.

Disk Statistics

The Disk Statistics page shows data on how often individual disks are accessed and how many retries have been performed in order to recover data. By hovering the mouse pointer over the "i" icons (adjacent to the disk number) detailed information about the disk will be shown.

😭 Storage Manager - [Nexsa	n RAID Storage\Favorites\YEL	LOW SAT	ABeast #1]					23
File Action View Help									
🗢 🔿 🖄 🖬 🚺 🖬									
nexsan					-				. ок
Home				D : 1					
RAID Information 🔹 🕟	Array Progress Volu	umes D	rives	Disk Stats	Info I	nfo Sta	st Syst ts Na	em v	
System Information			RA	ID Info Nick Sta	rmation tistics			?	
Configure RAID			L	nsk sta	usucs			0	
Configure Volumes	Disk		IOs		Transfe	r Retries	Media	Retries	
Config Host Access	Number	Read	Write	Others	Read	Write	Read	Write	
Power Settings	Disk1 (C0) 🕕	0	0	1206	0	0	0	0	:
Contorn Admin	Disk2 (C0) 🕕	1	0	1193	0	0	0	0	
System Admin	Disk3 (C0) 🕕	0	0	1192	0	0	0	0	
Configure Network	Disk4 (C0) U	0	0	1192	0	0	0	0	
Quick Start		0	0	1192	0	0	0	0	
Technical Support		0	0	1192	0	0	0	0	
Log Off		0	0	1192	0	0	0	0	
		0	0	1192	0	0	0	0	
		0	0	1192	0	0	0	0	
		0	0	1192	0	0	0	0	
		0	0	1192	0	0	0	0	
	Disk13 (C0)	0	0	1192	0	0	0	0	
	Disk14 (C0)	0	0	1192	0	0	0	0	
	Disk15 (C0)	0	0	1192	0	0	0	0	
	Disk16 (C1)	0	0	1090	0	0	0	0	
	Disk17 (C0)	0	0	1192	0	0	0	0	
	Disk18 (C1)	1	0	1084	0	0	0	0	
	Disk19 (C0)	0	0	1192	0	0	0	0	
	Disk20 (C1)	0	0	1084	0	0	0	0	
	Disk21 (C0)	0	0	1192	0	0	0	0	
	Disk22 (C1)	0	0	1084	0	0	0	0	
	Disk23 (C0)	0	0	1192	0	0	0	0	

The information displayed is as follows:

IOs, Read - shows the number of reads executed on each disk due to array access from attached hosts.

IOs, Write – this shows the number of writes executed on each disk due to array access from attached hosts.

IOs, Others – this shows the number of disk IOs executed on each disk that are not due to array access i.e. from the RAID controller itself.

Transfer Retries, Read – this shows the number of times overall, for each disk, that the RAID controller has had to retry in order to read a block of data due to interface data transfer problems.

Transfer Retries, Write – this shows the number of times overall, for each disk, that the RAID controller has had to retry in order to write a block of data due to interface data transfer problems.

Media Retries, Read – this shows the number of times overall, for each disk, that the RAID controller has had to retry in order to read a block of data due to disk media / surface problems.

Media Retries, Write – this shows the number of times overall, for each disk, that the RAID controller has had to retry in order to write a block of data due to disk media / surface problems.

When in active-active mode the controller number will be shown next to the disk. (C0) means the disk is owned by controller 0 and (C1) means the disk is owned by controller 1.

Fibre Information

This page provides a summary for each fibre port on each controller in the system.



The information displayed is as follows:

Fibre Port Name – Shows the address of the Fibre Port. A Fibre port is what an initiator connects to and is contained within the Fibre node.

Fibre Node Name – Displays the address of the Fibre Node. A Fibre Node is the address of the enclosure and is capable of supporting multiple ports.

Fibre Loop State – Displays the status of the Fibre Loop; status is either UP or DOWN.

SFP Information – Displays the make and model of installed SFP.

Topology - Displays the current topology - loop or point-to-point, see "

Fiber Channel Topologies".

Loop ID – Shows the loop address (if in loop mode).

Port ID – Shows the port ID (if in Point-to-point mode).

Link Speed – Shows the current Fiber Channel link speed.

NOTE – When in active-active mode all ports will be shown. Ports with a grey background are the passive ports. These will become active if one of the controllers fails.

iSCSI Information

This page provides a summary for each iSCSI port on each controller in the system.

😭 Storage Manager - [Nexsan	RAID Storage	e\Favorites\	YELLOW SATABeast #1]					x	
File Action View Help									
🗢 🄿 🖄 🖬 🛛 🖬									
ne <u>xsan</u>	A							<u>.L OK</u>	
Home RAID Information	RAID Array	Progress	olumes Disk Disk Fibre Drives Stats Info	iSCSI Info	Host Stats	System Nav		n	
System Information			RAID Informa	ntion				- 11	
Configure RAID			iSCSI Informa	ation					
Configure KAID	Contro	oller 0	iSCSI - Net 0		i	SCSI - N	et 1	-	
Configure Volumes	Current	State	Enabled	Enab	led	5051 N	eti	- 1	
Config Host Access	Target N	ame	iqn.1999-02.com.nexsan:p0: satabeast:07008086	iqn.1 satal	999-02.0	com.nex: 7008086	san:p1:		
Power Settings	IP addre	55	172.16.8.192	172.1	16.7.192	!			
System Admin	TCP port		3260	3260					
Configure Network	Contro	oller 1	iSCSI - Net 0		i	SCSI - N	let 1		
Quick Start	Current	State	Enabled	Enab	led				
Technical Support	Target N	ame	Iqn.1999-02.com.nexsan:p2: satabeast:07008086	iqn.1999-02.com.nexsan:p3: satabeast:07008086					
Log Off	IP addre	55	172.16.8.193	172.3	172.16.7.193				
	TCP port		3260	3260					
								=	
	Status		Host Name	Config	C0:N0	C0:N1	C1:N0	C1	
	● iSCSI	Host #1 05.com.	(iSCSI) iqn.1991- microsoft:nexsan-z8iazxgj	-	•	0	•	- (
	• iSCSI	Host #2 05.com.	(iSCSI) iqn.1991- microsoft:dvt06-52o1zdwc1	-	•	•	•	(
	● iSCSI	Host #3 05.com.	(iSCSI) iqn.1991- microsoft:kev-pc	-	0	0	0		
	● iSCSI	Host #4 05.com.	(iSCSI) iqn.1991- microsoft:super-server	-	0	0	0		
	ISCSI	Host #5 iqn.com	(iSCSI) ibm.istc.szx1g205.hostid.09baf54f]	-	0	•	•		
	• iscsi	Host #6 iqn.com	(iSCSI) ibm.istc.szx1g205.hostid.09baf54f	-	•	•	•		
	● iSCSI	Host #7 03.com.	(iSCSI) iqn.2005- redhat:01.a27be8f824b0	-	0	•	•		
	● iSCSI	Host #8 05.com.	(iSCSI) iqn.1991- microsoft:d9vszjc1	-	0	0	0		
	● iSCSI	Host #9 04.de.su	(iSCSI) iqn.1996- ıse:01:aed39b25ae7b	-	0	•	0	-	
	● iSCSI	Host #1 04.de.si	0 (iSCSI) iqn.1996- ise:01:b886967a4d3a	-	0	•	•	(
	•	_	III					•	
The information displayed is as follows:

Current State - Shows if the port is enabled or not.

Target Name – Displays the name of the iSCSI target.

IP Address – Displays the IP address of the iSCSI port.

TCP port – Displays the ports iSCSI is using – normally 3260.

Host connectivity is also shown in the lower part of the page.

Host Statistics

The Host statistics page displays various useful items of information about the ports, such as total reads and writes, number of blocks etc. – see below:



System Navigation

The system navigation page gives an overview of the configured arrays, volumes and array member disks in a hierarchal style view. Click the "+" icons to expand a branch of the tree, click the icons on the left to show the details in the right hand window.



System Information

System Information Summary

This page shows basic information about the storage system – see below:

😭 Storage Manager - [Nexsan R	AID Storage\Favorites\YELLOW SATA	Beast #1]		- • ×			
File Action View Help							
🗢 🔿 🖄 🖬 🚺 🖬							
e nexsan				<mark>√all ok</mark>			
Home							
RAID Information	System Enviro Network Net Info Info Ser	work Network Problems Eve vices Stats Lo	ent Multi Key og View				
System Information Configure RAID		System Information Summary Information	1				
Configure Volumes	Description	Infor	nation				
Configure volumes	System	SATABeast					
Config Host Access	System ID	07008086					
Power Settings	System Mode	All Ports All LUNs					
System Admin	Active controllers	2					
System Admin	Enclosure type	Rack, 4U					
Configure Network	Host connection	2 x Dual 4Gbit fibre ports					
Quick Start	System Time	Friday 04-Dec-2009 17:40:					
Technical Sunnort	Description	Controller 0	Controller 1				
rechincal support	Controller status	Up (Master)	Up (Slave)				
Log Off	Controller up time	1 Days, 05 Hours, 11 Mins 56 Secs	1 Days, 05 Hours, 1 53 Secs	1 Mins			
	Firmware revision	Gt66	Gt66				
	Boot Loader revision	V017	V017				
	Emergency revision	Gt66E	Gt66E				
	Controller serial number	000402FC8086	000402FC3031				
	Cache	495 MB, Enabled, Mirrored, FUA ignored	495 MB, Enabled, M FUA ignored	irrored,			
http://172.16.8.192/sysinfo.asp							

The information displayed is as follows:

System – Displays the storage unit's Family Model.

System ID – Displays the unique system ID number.

System Mode – Displays failover configuration.

Active Controllers – Displays the number of active controllers in the system.

Enclosure Type – Displays the physical attributes of the system.

Host Connection – Displays the type of host connection.

System Time – Displays the current time and date, according to the unit's real time clock.

Controller Status - Shows whether the controller is running.

Controller up time – Displays the time the controller has been operating.

Firmware revision – Displays the firmware version.

Boot Loader revision – Displays the revision number of the boot loader.

Emergency revision – Displays the version of code used for alternative boot.

Controller Serial Number - Displays the serial number of the controller

Write cache – Displays the write cache capacity and status.

Environmental Information

The Environmental page display the values of the various environmental sensors built into the unit, such as voltages and temperatures – see below. Some items listed may vary for different unit types.



The information displayed is as follows:

PSU(n) state – Displays the status of the Power Supplies.

PSU(n) temperature – Displays the temperature of the Power Supplies.

PSU Blower(n) - Displays the status of the PSU blowers.

XXX Voltage – Displays various PSU or CPU voltages.

Battery Voltage – Displays the back-up battery's voltage.

Controller temperature – Displays the temperature of the controller.

Battery Temperature – Displays the temperature of the battery. Note that a SATABoy with 2 memory DIMMs will have 2 batteries per controller, but a SATABeast will have only a single large battery per controller.

Battery Charge Mode – Displays the cache battery charging mode.

Network Information

The network Information page provides summary information about the networking ports of the unit.

😭 Storage Manager - [Nexsan R	AID Storage\Favorites\YELLOW SATAB	east #1]	
File Action View Help			
🗢 🔿 🖄 🖬 🚺 🖬			
			<mark>√all ok</mark>
Home			
RAID Information	System Enviro Network Network	vork Network Problems Eve	nt Multi Key a View
NAID IIITOTIIIation		System Information	9
System Information 🕟	1	Network Information	
Configure RAID			
Configure Volumes	Controller 0	Net 0	Net 1
configure volumes	IP address assignment	Static IP	Static IP
Config Host Access	Port IP address	172.16.8.192	172.16.7.192
Power Settings	Subnet mask	255.255.0.0	255.255.0.0
System Admin	Gateway IP address	172.16.1.1	Not configured
System Admin	Primary DNS IP address	172.16.1.11	
Configure Network	Secondary DNS IP address	172.16.1.15	
Quick Start	Hostname	SATABeast-07008086-0	SATABeast-07008086-0
Technical Sunnort	Ethernet address	00-04-02-FC-80-86	00-04-02-FE-80-86
rechnical support	Port Mode	Auto Speed, Auto Duplex	Auto Speed, Auto Duplex
Log Off	Jumbo Frames	Enabled	Enabled
	Port Status	1Gbit Full Duplex	1Gbit Full Duplex
	Controller 1	Net U	Net I
	Port ID addross	172 16 9 102	172 16 7 102
	Subnet mask	255 255 0 0	255 255 0 0
	Gateway IP address	172.16.1.1	Not configured
	Primary DNS IP address	172.16.1.11	not comgared
	Secondary DNS IP address	172.16.1.15	
	Hostname	SATABeast-07008086-1	SATABeast-07008086-1
	Ethernet address	00-04-02-FC-30-31	00-04-02-FE-30-31
	Port Mode	Auto Speed, Auto Duplex	Auto Speed, Auto Duplex
	Jumbo Frames	Enabled	Enabled
	Port Status	1Gbit Full Duplex	1Gbit Full Duplex

The information displayed is as follows:

IP address assignment – Displays whether the IP address is set manually or via DHCP.

Port IP address – Displays the current IP address.

Subnet mask – Displays the current subnet mask.

Gateway IP address – Displays the current gateway.

Primary / Secondary DNS IP address – Displays the DNS settings.

Hostname – Displays the default or user-set host name of the device.

Ethernet address – Physical Ethernet address.

Port Mode – Displays the speed and duplex settings of the network port.

Jumbo Frames – Displays whether Jumbo frame usage has been set or not.

Port Status – Displays the current speed and duplex settings of the network port.

Network Services

The following page provides information on various system settings.



The information displayed is as follows:

When to send E-alerts – Displays if and when emails are sent.
Send automatic status emails – Displays how often auto status emails will be sent.
Recipient email address (1 to 4) – Displays the target address of email alerts.
Sender email address – Displays the email from address for email alerts.
Friendly name – Displays the user defined friendly name of the system.
SMTP server – Displays the email server IP address or name.
Current emailer status – Displays if the emailer is ready or how many emails are queued to be sent.

IP address for SNMP traps - Displays the IP address that SNMP traps will be sent to.

Community String - Displays the SNMP password known as the "community string".

Trap version – Displays the type of SNMP trap that will be sent.

Test String – Display the string that is sent for testing.

When to send SNMP traps - Displays the circumstances under which an SNMP will be sent.

Auto set time and date – Displays whether the time and date is being automatically set by a daytime server.

Timer server protocol – Displays the method by which the real time clock is updated. **Selected time server** – Displays the current IP address of the daytime server, this can be a manually entered IP address or from the fixed list of daytime servers.

Daytime server date and time format – Displays the date and time format if the Daytime server is used. **Retrieved daytime server data** – Displays data from the Daytime Server.

ADMIN account status – Displays the status of the ADMIN account, "Password is default" means the password has not been changed from the factory default.

USER account status – Displays the status of the USER account, "Password is default" means the password has not been changed from the factory default.

GUI mode – Displays the current GUI restrictions, "Full GUI access" indicates there are no restrictions.

SSL certificate - Shows the current SSL certificate type in use.

SSL mode – Selects what type of browser connection is allowed to the RAID system. 'HTTP only' closes network port 443 which disables SSL or HTTPS connections. 'HTTPS only' enables SSL and disables HTTP connections, port 80 remains open and any HTTP requests will be automatically redirected to HTTPS. 'HTTPS and HTTP' allows either HTTPS or HTTP connections.

Certificate mode - Shows the current SSL certificate mode in use. See "SSL Configuration".

Webpage refresh - Displays the current status of the webpage auto refresh.

Colored array text - Displays use of coloured text.

JavaScript enhancements – Displays whether JavaScript is being used in the web GUI. JavaScript RAID icon info – Displays whether the JavaScript tool tip is being used for RAID icon help. Reduce scrolling by using submenus – Displays optional use of submenus in the GUI. Reduce scrolling by showing less info. – Displays whether pages have reduced information.

Network Statistics

The network statistics page displays information on network packets.

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Home	ustem Envire Networ	h Network	Network	Event	M		
RAID Information	Info Info Info	Services	Stats Problems	Log	View Key		
System Information 🕨		Syst Net	em Informatio work Statistics	n ;			
Configure RAID							
Configure Volumes	Controller 0		Net O		Net 1		
Config Host Access	Transmitted Packet	s	44548	18			
Power Settings	Transmit Errors		0	0	0		
rower settings	Received Packets		3688706	36	71303		
System Admin	Receive Errors		0				
Configure Network	Cantuallan 1	_	N-t O		81-4-1		
Quick Start	Transmitted Dacket		Net 0	12	Net I		
Technical Support	Transmit Errors	3	29004	12			
rechnical support	Received Packets		2674246	26	71250		
Log Off	Receive Errors		0	0	/1250		
			U C	0			

Problem Description Page

If a problem occurs on your storage unit, you can either navigate to the "<u>Problem Description Page</u>" page through the menus, or click on the red "X Failure" or the "green tick" text at the top right of any web page to go directly to the problem page.

Each problem will be described in sequence in a list on the problem page. The screenshot below shows a system with no current problems. To see an example of a page showing problems, go to "<u>Home Page with</u> "<u>Failure</u>" Status".

NOTE – The "Beacon" button can clicked to identify the current unit in a population by flashing the front panel LEDs for one minute.

😭 Storage Manager - [Nexsan	n RAID Storage\Favorites\YELLOW SATABeast #1]	x						
File Action View Help								
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la nexsan		<u>- ок</u>						
Home	System Enviro Network Network Network Problems Event Multi Key							
RAID Information	Info Info Info Services Stats Log View							
System Information 🕟	System Information Summary of System Problems							
Configure RAID								
Configure Volumes	Number Description							
Config Host Access	There are no problems with this system							
Power Settings	Beacon							
System Admin		=						
Configure Network								
Quick Start	. (?)							
Technical Support	Help							
Log Off	Clicking on the Beacon button will cause the front panel leds to flash green for one minute.							
		•						

Most of the time there will be no information in this page. It should be noted that when in active-active mode, problem messages will normally have a controller number shown that indicates which controller has the problem. When a controller number is not shown the problem will not be related to a specific controller, for example, a failed PSU.

Number	Description							
1	PSU1 has failed							
2	PSU blower number1 is running too slow, ORPM							
3	The 12V voltage rail is not at the correct voltage, controller 0							
4	The 5V voltage rail is not at the correct voltage, controller 0							
5	The 3.3V voltage rail is not at the correct voltage, controller 0							
6	RAID controller temperature is too high, controller 0							

Event Logs

Your Nexsan storage unit has comprehensive instrumentation and logging capabilities. All kinds of events and configuration data are recorded into files stored in a small reserved area of the disk arrays.

Some of the events are purely information and others can show up real problems. It is common with a complex network that the storage device is blamed whenever there is an issue with accessing data, but surprisingly often, problems are caused by changes made by operators, or by failures elsewhere in the system. In any case, the event logs often provide vital clues that may help in eliminating the problem. Some of the recorded data is easy to understand, but much of it is cryptic and only meaningful to Nexsan Tech Support. An example event log is shown below:

😭 Storage Manager - [Nexsan F	AID Storage\Favorites\YELLOW SATABeast #1]	
File Action View Help		
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nexsan		
Home	Fuston Enviro Notwork Network Network	A Nulti
RAID Information	Info Info Info Services Stats	Log View Key
System Information 🕟	Syste	em Information
Configure RAID		
Configure Volumes	Log/Configuration	Display Options
Config Host Access	Event Log	Filter by Controller: All entries
Power Settings	General Configuration Volumes & Host Access	Filter by Date: All entries
System Admin	Disk Configuration	Filter by Importance: All entries
Configure Network	Download log/config dump as text (HTML)	Date Format: dd-mmm-yyyy at hh:mm:ss 💌
Ouick Start	bowinded log/ coming during do text (intric)	Show event icons 🗹 Show controller colours Update
Technical Support		
		Event Log
	0001:C0 06-Dec-2009 at 10:26:34:[1]: Surface : 0002:C1 06-Dec-2009 at 07:32:01:[1]: Surface : 0003:C0 06-Dec-2009 at 07:23:42:[1]: Surface : 0004:C0 03-Dec-2009 at 07:23:42:[1]: Surface : 0004:C0 03-Dec-2009 at 13:03:29:(W): Netword 00:04:02:FE:00:10) 0006:C0 03-Dec-2009 at 12:38:21:(S): Quick Cf 0008:C0 03-Dec-2009 at 12:29:38:(S): Quick Cf 0008:C0 03-Dec-2009 at 12:24:47:(S): iSCSI: T 0009:C0 03-Dec-2009 at 12:24:47:(S): iSCSI: T 0010:C1 03-Dec-2009 at 12:24:47:(S): iSCSI: T 0011:C1 03-Dec-2009 at 12:24:44:(S): iSCSI: T 0011:C1 03-Dec-2009 at 12:24:44:(S): iSCSI: T 0012:C1 03-Dec-2009 at 12:24:44:(S): iSCSI: T 0012:C1 03-Dec-2009 at 12:24:40:(S): cachelin 0015:C1 03-Dec-2009 at 12:24:40:(S): cachelin 0015:C1 03-Dec-2009 at 12:24:39:(S): [1] LSI9 0016:C1 03-Dec-2009 at 12:24:36:(S): Network 0019:C1 03-Dec-2009 at 12:24:36:(S): Network 0019:C1 03-Dec-2009 at 12:24:36:(S): Network 0019:C1 03-Dec-2009 at 12:24:36:(S): Network 0019:C1 03-Dec-2009 at 12:24:36:(S): netsvc: 0022:C0 03-Dec-2009 at 12:24:35:(I): Serial Nu 0023:C0 03-Dec-2009 at 12:24:35:(I): Serial Nu 0023:C0 03-Dec-2009 at 12:24:35:(I): Serial Nu 0024:C0 03-Dec-2009 at 12:24:35:(I): Serial Nu 0025:C0 03-Dec-2009 at 12:24:	scan for RAID set 1 has finished scan for RAID set 2 has started scan for RAID set 1 has started k: Duplicate IP detected (172.16.8.192 is also assigned to harge Termination: Voltage 8.48V arget Istening on 172.16.7.192:3260 arget listening on 172.16.8.192:3260 arget listening on 172.16.8.192:3260 arget listening on 172.16.8.193:3260 arget listening on 172.16.8.193:3260 started: 21-disk RAID6, 128k stripe es 22016, stripes 1536, write buffers 8000 49: firmware version 01.03.21, dev 0, port 1 loaded tware version 01.03.21, dev 0, port 1 loaded to 2016, stripes 1536, write buffers 8000 : IP address configured to 172.16.8.193 Port 1 link up, 1000BT/FD Todel HDS725050KLA360, Firmware K2AOAD1A mber KRVN65ZAJM352F, 976773168 Blocks todel HDS725050KLA360, Firmware K2AOAD1A mber KRVN65ZAJLZPTF, 976773168 Blocks todel HDS725050KLA360, Firmware K2AOAD1A

There are four types of events generated by the storage unit:

Information events, these are purely for user information, for example showing disk details when the unit is powered up.

System events, these are similar to information events yet may be of less use to a user and are normally generated from low level system operations, for example showing fibre port status.

Warning events, these are problems that a user needs to be aware of that may indicate an imminent problem or a failure. Warning events are unlikely to compromise data availability, for example changing of the IP address assigned by DHCP.

Error events, these are serious problems that will most likely require user intervention and may indicate your data is at risk, for example a failed disk.

The event log can be viewed in various ways using the filters.

NOTE – When in active-active mode the controller number that posted the event will be shown, for example see below, "C1" indicates a controller 1 event and "C0" indicates a controller 0 event.

General Configuration

There is a General Configuration page which details all sorts of information about the setup of your unit – see below.



Volumes and Host Access

You can see the details of Volume mappings to your arrays and which hosts have access to these volumes on the page below. This is a good place to check if you think you should have access to a volume that your server cannot see.



Disk Configuration

This page provides a summary of all the disks in your system.

	AID Storage	<pre>\Favorites\YELL</pre>	LOW SATAB	east #1]					
File Action View Help									
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Home	Eustom	Enviro Not	uark Natu	uork N	atuark	Even	Multi		
RAID Information	Info	Info In	fo Serv	rices	Stats Prob	lems Log	View	Key	
System Information 🕨					Sys	stem Info Event l	ormation log		?
Configure RAID						Licit	209		
Configure Volumes		L	og/Confi	gurati	on			Display Options	
Config Host Access	•	<u>General Cor</u>	nfiguratio	on					
Power Settings	•	<u>Volumes & </u> Disk Confiqu	<u>Host Acc</u> uration	ess					
System Admin									
Configure Network	Do	wnload log/	<u>config d</u>	<u>ump a</u>	<u>s text (HI</u>	<u>ML)</u>			
Quick Start					I	Disk Config	uration		
Technical Support									
Log Off	***** *Dis}	<pre>************************************</pre>	ion*						
	****	********	****						
	Disk	Function	Array	Owner	Status	Meta	-data	Manufacturer Data	
		-+ 	1	+ I	+ I	Init	: 132154	Model: HDS725050KLA3	360
	1	Array Member	1	C0 	I OK	LDN Leve	: 0 1: RAID 6	F/W : K2AOAD1A Ser# : KRVN65ZAJM4BH	IF
		i	į	i	į	Sync	: 1085	Size : 500108MB	
		i -	i	i	i	Init	: 132154	Model: HDS725050KLA3	360
	2	Array Member		C0 	lok	LDN Leve:	: 1 1: RAID 6	F/W : K2AOAD1A Ser# : KRVN65ZAJM352	2F
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				 +	 +	Sync	: 1085	Size : 500108MB	
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			1	l +	I +	Sync	: 1085	Size : 500108MB	
		1	1	1	I	Init	: 132154	Model: HDS725050KLA3	860
	6	Array Member			IOK	LDN Level	: 5 1: RAID_6	F/W : K2AOAD1A Ser# : KRVN65ZAJLXXI	DF

Download Log/Config Dump as Text Files

If you are experiencing difficulties a Tech Support engineer may ask you to email a copy of the Event Log Config information as a text file to your technical support representative. This can be downloaded as a file from the GUI on the event log page. With this information the support engineer should be able to quickly spot any problems in the configuration. To get the file, click on "Download log/config dump as text" and continue from the "Save" dialogue shown below.



Use mailto:support@nexsan.com to send the file to Tech Support.

MultiView Management

The Multi View page is HTML page that monitors multiple Nexsan storage units. Multi View may be used with remote Nexsan storage products. You can scan a range of IP addresses or scan your current subnet for devices to automatically find storage devices. Alternatively, enter the individual IP addresses of the disk arrays you wish to view in the left hand column. You can also add up to four ranges of address. To do this, enter the start of the range into the left column and the end of the range in the adjacent right column.

😭 Storage Manager - [Nexsan	n RAID Storage\Favorites\YELLOW SATABeast #1]									
File Action View Help										
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a nexsan		<mark>√ <u>all ok</u></mark>								
Home	Sustam Enviro Notwork Network Network Evant Multi	^								
RAID Information	Info Info Info Services Stats Problems Log View Key									
System Information 🕟	System Information Multiple View HTML Builder	(?)								
Configure RAID										
Configure Volumes	Attempt to automatically detect RAID system	s								
Config Host Access	From IP address To IP address									
Power Settings	Scan A Range									
System Admin										
Configure Network	Dura The Dahard									
Quick Start	Scan the Sublet									
Technical Support		=								
Log Off	IP address of remote RAID system Optional end IP addr	ess of an IP address range								
	172.10.0.132									
	Build Multiple View Page									

When the addresses have been added, click the "Build Multiple View Page" button at the bottom of the page.

Clicking the button will load the confirmation page below. Press "Click here to display multiple view page" to continue.



The new page will display a small graphical representation of each unit, as follows:

🔗 Storage Manager	- [Nexsan RAID Storage\Favorites\SATABeast]	A. A	1	- • ×
File Action View	w Help			
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				*
	Multiple view of rei	note RAID systems		
IP address	Cur	rent system status		
<u>172.16.8.114</u>	SATABeast SN:01009090 FW:Ga66 Total capacity 3999.8 GB No. of RAID arrays : 4 No. of Pol spares : 2 Array status: OK 14:54:36 Monday 15-Sep-2008	RAID Combine PSU and blower RAID status		FAILURE
<u>172.16.8.115</u>	SATABeast SN:01009090 FW:Ga66 Total capacity 3999.8 GB No. of RAID arrays: 4 No. of Pool spares : 2 Array status: OK 14:55:03 Monday 15-Sep-2008	RAID Combine PSU and blower RAID status		FAILURE
<u>172.16.8.120</u>	SATABoy SN:015810C7 FW:Ba66 Total capacity 6000.7 GB No. of RAID arrays : 4 No. of Pool spares : 0 Array status: OK 14:55:36 Monday 15-Sep-2008	RAID RAID		ALLOK
<u>172.16.8.121</u>	SATABoy SN:015810C7 FW:Ba66 Total capacity 6000.7 GB No. of RAID arrays : 4 No. of Pool spares : 0 Array status: OK 14:55:33 Monday 15-Sep-2008	RAID RAID	PSU PSU	ALL OK

Each scanned device shows the following information.

- RAID Controller Status
- Blower Status
- PSU Status
- Overall Status
- System Type
- Serial Number
- Firmware Revision
- Total Storage Capacity
- Number of Configured Arrays
- No of Spares
- Time & Date

You can also save the HTML data of this page to your computer and view the MultiView window without loading the GUI.

NOTE – To prevent your browser from modifying the html and saving the multi-view images locally (which will prevent Multi-view from working), right click the multi-view page, select "view source" then save the raw html to your local hard disk. When this html is loaded all the images will be fetched from the remote storage systems, the current status of all the systems in the multi-view page will then be shown.

Symbol Key

The following pages show all of the icons used in the GUI and explains what they each mean. There are too many to show on a single page without scrolling.



😭 Storage Manager - [Nexsan RAID Storage	e\Favorites\YELLC	DW SATABeast #1]	- 0 X
File Action View Help			
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			<mark>√all ok</mark>
Home		PSU is functioning correctly	^
RAID Information		PSU has failed	
Configure RAID	RAID	RAID controller is functioning correctly	
Configure Volumes	RAID	RAID controller is indicating a problem	
Config Host Access		Audible alarm is not sounding	
Power Settings		Audible alarm is sounding	
Configure Network			
Quick Start		Fault tolerant RAID array	
Technical Support			
Log Off		Critical RAID array	
		Offline RAID array	
		RAID array is being constructed	E
		RAID array is rebuilding	
		Logical Volume	
	\checkmark	There are no problems with the RAID subsystem	
	×	There is at least one problem with the RAID subsystem	
		At least one warning message exists in the problem summary or a general warning	
http://172.16.8.192/status.asp			

Storage Manager - [Nexsan RAID Storage\Favorites\YELLOW SATABeast #1]							
File Action View Help							
🗢 🔿 🖄 🖬 🛛							
nexsan	7.11						
Home		At least one warning message exists in the problem summary or a general	· ·				
RAID Information		warning					
System Information 🕩	•	Host/port connected					
Configure RAID	•	Host/port connected, but LUN not mapped					
Configure Volumes		Light/part not connected or offling					
Config Host Access	-						
Power Settings	•	Port belongs to a failed controller					
System Admin		File download					
Configure Network	?	Help information					
Quick Start		Error event					
Technical Support							
Log Off	0	Information event					
	\$	System event	E				
	1	Warning event					
			-				

Configure RAID

If you do not wish to use the default setup of the storage unit, you can create your own arrays, and then map volumes onto those arrays. In order to create a RAID array you must have free or unused disks. Free disks are disks that do not belong to a RAID array and are not configured as hot spares. If there are no free disks then disks must be made available by deleting a configured RAID array – see "Delete Array" – or by deleting a sufficient number of hot spares.

Hot spares are easily deleted – see "<u>Delete Spare Disk</u>" – but RAID arrays must contain no volumes before they can be deleted. To delete volumes from an array see "<u>Delete Volumes</u>".

CAUTION: Do not delete any array that contains useful data. Be sure to move data prior to deletion.

Add Array

This page lets you build a new array providing there are enough available disk drives.

😭 Storage Manager - [Nexsan R/	AID Stora	age\Fav	orites\\	ELLOW	SATAB	east #1]								Σ	3
File Action View Help															
														ALL O	ж
Home	Add	Ren	ame	Delete	Arr	av	Add	Del	ete	Snare		ct	Rebuild		-
RAID Information	Array	Arr	ay	Array	Ow	ner	Spare	Spa	re	Mode	Da	ta	Ack		
System Information					Cre	Coi ate a	nfigu a Nev	re R/ v RA	AID ID A	rrav				?	
Configure RAID 🔹 🕟										,					
Configure Volumes	•		_		N	lew A	rray C	onfig	uratio	on			-		
Config Host Access	Array	nam + PATI	e D lovo						E (rota	ting po	ritu)	-			
Power Settings	Selec	t strir	pe siz	e				128 K	bytes	▼	(iiiy)	<u> </u>			
System Admin	Selec	t arra	y owi	ner				Contr	oller 0	-					
Configure Network	Online	e Crea	ate					•							
Quick Start	Diek1	Diek2	Diek2	Diek4	Diek5	Dieks	Diek7	Dieke	Dieka	Dick10	Diele11	Diek12	Diek12	Diek14	
Technical Support															
Log Off	-	_	-	=	-	-	-	-		-	-	-		_	Ξ
	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	Array #1	
	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	(C0)	
	Disk15	Disk16	Disk17	Disk18	Disk19	Disk20	Disk21	Disk22	Disk23	<u>Disk24</u>	Disk25	Disk26	<u>Disk27</u>	Disk28	
												$\underline{\sim}$			
	#1 (C0)	#2 (C1)	#1 (C0)	#2 (C1)	#1 (C0)	#2 (C1)	#1 (C0)	#2 (C1)	#1 (C0)	#2 (C1)	#1 (C0)	#2 (C1)	#1 (C0)	#2 (C1)	
	(00)	(01)	(00)	(01)	(00)	(01)	(00)	(01)	(00)	(01)	(00)	(01)	(00)	(01)	
	DISK29		Disk31			Disk34	DISK35	Disk36	Disk3		Disk39	Disk4		Disk42	
		-	7	7	7	-	-	-	7		-	7			
	Array	Array	Array	Array	Array	Array	Array	Array	Array	Array	Array	Array	Array	Array	
	(C1)	#2 (C1)	(C1)	(C1)	(C1)	(C1)	(C1)	(C1)	#2 (C1)	(C1)	(C1)	(C1)	(C1)	(C1)	
					(Create	RAID S	Set	R	eset					
	Global	selectio	ons 🗆 🤇	Select d	isk row	1									
				Select d	isk row	2	Refre	sh pag	е						
				Select d	isk row	3									
							<u>Help</u>	?							
															-
						_	-	_							

The information displayed is as follows:

Array Name – This is a friendly name that will help you identify the new RAID array, set this to something that describes the use of the array such as "customer database" or similar.

Select RAID level – allows you to choose the RAID level that best suits your application. Use the drop down to select the correct RAID level.

Select stripe size – use the drop down menu to select the desired stripe size for your array. This may affect system performance. As a general rule, select a smaller stripe size if your host will be reading / writing small files. Select a larger stripe size if your host will be reading / writing larger files.

Select array owner – this option is only shown in active-active mode, use this to select which controller the array will belong to.

Online Create – Selecting this option will allow volumes to be accessed immediately, but performance will be degraded until array verification is complete. If this option is not selected, volumes will only become accessible once array creation is complete. Online creation will take longer than offline creation.

Select the available drives by checking the appropriate tick boxes. Once all the settings and disks have been selected, click the "Create RAID Set" button to begin RAID array construction.

The construction of an array takes several hours. You can check on the progress of this in the Progress page – see "<u>Progress</u>". The Progress page displays the progress of any controller based utility working on any of the configured arrays.

Rename Array

The Rename array feature is used to change the user defined friendly name of each configured array.



Delete Array

CAUTION: Do not delete any array that contains useful data. Be sure to move data prior to deletion.

To delete a RAID array with no configured volumes follow the instructions below.

Each array has a radio button – see screenshot below. Click the radio button of the array you wish to delete (you can only delete one array at a time). Then click the "Delete RAID Array" button.



If there are still volumes configured on this array you will not be able to delete it. You must first delete the volumes on the array. If the array is volume free you will see the following warning page.



To continue with deleting the array, click the tick box (as shown above) and then click the "Confirm Delete Command" button. Decide which controller owns the array – see "<u>Array Owner</u>".

Array Owner

When operating in active-active mode there is an additional tab shown for the "Array Owner" page.

This page allows the controller that owns on arrays to be changed. The controller that owns an array will be the controller that processes host IO for the volume(s). Should a controller fail, the arrays owned by the failed controller will temporally be moved over to the surviving controller. When the failed controller is replaced or restarted the arrays will move back to the configured owner controller. When in active-active mode performance can normally be improved by dividing the configured arrays between the controllers

Decide which controller owns each array by selecting a controller via the radio buttons and then pressing the "Save Changes" button. Note that any conflicting LUNs will be set to "unmapped".



Add Spare Disk

Add a pool hot spare disk (a.k.a. floating/global) – this type of spare disk will be used by any existing parity array that becomes degraded providing the capacity of the disk is large enough to be used by the degraded array.

NOTE – For a spare disk to be of use it must be of equal or greater size compared with the existing drives in the array.

Add a hot spare disk dedicated to an array (select radio button from the list of arrays) – this type of spare is assigned to a specific array, if any other array becomes degraded this disk will not be used for rebuilding, this disk will only be used to rebuild onto by the array it is assigned to. Note that when adding this type of spare the array it is to be assigned to must be selected.

NOTE – Under default configuration when a new disk is inserted the disk will automatically be configured as a pool spare.



Delete Spare Disk

Select the hot spare disk(s) that you wish to delete. This will delete "dedicated spares" and "pool spares" (a.k.a. "global spares"). Once you have made your selection by clicking the appropriate checkboxes click "Delete Hot Spare".

This function does not ask for confirmation as a hot spare disk can easily be added after deletion without losing data. Note that if an array becomes degraded and there are no hot spares available then your data is at risk of being lost should another disk fail (assuming parity RAID).

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Spare Disk Mode

When you insert disk drives into the system, you can choose to let the system automatically configure the disk as a Hot Spare or to just leave the disk as an unused or "free disk", in which case it cannot be used for rebuilding a critical or degraded array.



Acknowledge Lost Data

The Lost Data page is used to acknowledge and clear the warning regarding missing data due to bad blocks.

When the RAID controller cannot reconstruct array data due to there being no access to the redundant data (2 or more blocks not accessible or using RAID 0) then you will see the "The RAID controller has found some unrecoverable data blocks" warning in the problem page. Click the "Acknowledge lost data warning" button to clear this warning.

NOTE – It is recommended that you then run a host based OS utility that can detect and repair disk errors such as "scandisk".



Acknowledge Rebuild

When a RAID array has been through a reconstruct process, the problem has to be manually acknowledged. This ensures the system administrator is aware that a failed disk exists and a spare disk has been used.

Click the "Acknowledge RAID Array Reconstruction" to clear the array reconstruction warning.



Configure Volumes

In order to use the capacity in an array, a volume must be created first. By default, one full-size volume is created for each array created (unless the 2.2TB limit is exceeded). This default volume can, however, be deleted and multiple smaller ones created instead. Volumes can also be mapped to either one or both of the host ports of the unit's controllers. An array can contain one or many volumes and independent hosts can access different volumes on the same array. Essentially, the host server will see each configured volume that it has been granted access to, as if it were a large disk drive.

NOTE – When 2 or more volumes are configured on an array the disk heads will have to seek between the different areas of the array to service host IO for the configured volumes. If performance is of importance then configuring 2 or more volumes may reduce performance (depending on how the volumes are being used by the host/s) due to the extra time taken for the disk heads to seek.

Add Volume

If you create a new array, or of there is space available on and existing array, you can add a new volume to make a chunk of storage visible to the host.


The array "Array #1" had some free space, so a volume can be created on that space. Select the radio button for Array #1 and then press the "Next" button. You will see a page similar to this:



The information displayed is as follows:

Enter the name for the new volume - type the friendly name of your new volume here.

Enter the size of the new volume in MB – choose the size of the new volume in Megabytes or the currently selected units. You can change the units by selecting the desired radio button and clicking on the "Change Units" button, then click "Change Units", the page will refresh.

NOTE – The available units are:

- MB or Mega Bytes, where 1MB = 1,000,000 bytes
- GB or Giga Bytes, where 1GB = 1,000,000,000 bytes
- % or percent, a size that is a percentage of the total array capacity.
- MiB or Mega binary Bytes, where 1MiB = 1048576 bytes (most Operating systems use this to represent Mega Bytes)
- GiB or Giga binary Bytes, where 1GiB = 1073741824 bytes (most Operating systems use this to represent Giga Bytes)

Nexsan products use MB, GB, TB to display volume and array capacities, MiB, GiB, TiB are shown in grey as a secondary capacity value. (Where one TB or Terabyte is 1,000,000,000,000 bytes).

Near the bottom of the page down the page, you can see that a volume with name "Test Example" has already been created. More meaningful names are helpful on a live system. Going back to the top of this page, you can create an array, perhaps called "Engineering Data" with 10G of space:

😭 Storage Manager - [Nexsan	RAID Storage\Favorites\YE	LLOW SATABeast #1]		
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Home	Add Expand D	elete Rename Map		^
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Configure Volumes 🕠	Array	#1 selected, Controller	0, RAID6, 9.5 TB (8.6 TiB)
Config Host Access	Enter the name	for the new volume	Engineering D	ata
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System Admin	Limit volume siz	e to less than 2TB		
Configure Network				
Quick Start		Create Volume	Reset	
Technical Support				E
Log Off	• MB	С дв С % С мів	C GiB Change	Units
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	Free space Array 1, C Total cap	ce on Array #1 Controller 0 acity 9.5 TB (8.6 TiB)		
	Free Area	Size in MB	Size in GB	% of Array
	Total	7125580 MB	7125.5 GB	75
	1	7125580 MB	7125.5 GB	75
	Below bar re	epresents the size and	position of the free	100%
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		Volume ID (1)	on Array #1	
	Volume name Volume capacity % of total array Number of bad b LUN mapping Volume serial nu Volume created	Volume # 2375193 used 25% locks 0 Click to vi mber 659CBEC Friday 09	#1 MB, 2375.1 GB (22 ew 9 0-Oct-2009 14:26:3	212.0 GiB) 8
			Existing on array 1, 375193 MB, 2375.	controller 0 1 GB (2212.0 GiB)
	Below bar	represents the size and	i position of the ab	100%

Click on "Create Volume" to make the volume, and new page will appear that confirms the volume has been created – see below.

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Power Settings	Volu	ume LUN Mapping 9 Host 0 9 Ho	st 1 9 Ne	ISCS	51 • Ne	et 1			
System Admin	3	: 'Engineering Data' CO	x			-	_		
Configure Network	A Co	pontroller 0					-		
Quick Start	- C	apacity: 10.0 GB C1	•	•		-			
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		Other Hosts							
0	iscsi	05.com.microsoft:nexsan-z8iazxgj	V	0	0	•			
0	iscsi	Host #2 (iSCSI) iqn.1991- 05.com.microsoft:dvt06-52o1zdwc1	•	0	0	0			
0	iscsi	Host #3 (iSCSI) iqn.1991- 05.com.microsoft:kev-pc	V	0	0	©			
0	iscsi	Host #4 (iSCSI) iqn.1991- 05.com.microsoft:super-server	~	0	0	©			
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6	iscsi	Host #6 (iSCSI) iqn.com.ibm.istc.szx1g205.hostid.09baf54f		0	0	۲			
6	iscsi	Host #7 (iSCSI) iqn.2005- 03.com.redhat:01.a27be8f824b0	V	0	0	۲			
6	iscsi	Host #8 (iSCSI) iqn.1991- 05.com.microsoft:d9vszjc1	~	0	С	۲			
0	iscsi	Host #9 (iSCSI) iqn.1996- 04.de.suse:01:aed39b25ae7b		0	С	0	-		

Host access to a volume is created as a two stage process – mapping and access rights. The user selects which LUN is seen on which ports (fibre or iSCSI ports) to represent the newly created volume. The user can see all the hosts that have historically been visible to this storage unit and should select which of these has read or write access (or both or none). Failing to map LUNs (volumes) to ports or selecting host access rights will mean the volume will not be usable.

NOTE – The volume can be mapped to a LUN or left UNMAPPED on any port. The mapping of a volume to a port applies to all hosts that have access to that port.

Once LUNS have been chosen, move lower down the page press the "Apply Changes" button to complete the Add Volume process.

The following shows the result of mapping LUN3 to the "Engineering Data" Volume:



Note the following in regard of hosts:

lcon	Description
•	Host is online and connected to a mapped port
•	Host is online, but not connected to any mapped ports
0	Host is offline

Expand Volumes

This page allows you to increase the amount of storage assigned to a particular volume. This can only be done if there is unused space in the array. Once you have located the volume you wish to expand, enter the new size in the text box, observing the current unit configuration (MB, GB or %), and click "Expand Volume". You will then be presented with a confirmation page, as the size of the volume cannot be reduced in the future. Make sure that you have selected the correct volume by checking the volume name, capacity, serial number, and LUN mapping.



Delete Volumes

This page allows you to delete volumes that have been previously created.

NOTE – If you want to delete an existing, configured array, then you must delete all the configured volumes on that array first.



The delete volume page displays a lot of information for each array in turn and must be carefully checked before deleting any volumes. To delete a volume click the "Delete Volume" button against the desired volume. The following warning page will appear; Click on the tick box, then click the "Confirm Delete Command" to confirm that you wish to delete the volume. The example below shows our attempt to delete the "Engineering Data" volume.



So long as we checked the tickbox, the following page is displayed:



You can see that the volume has been deleted after the "Back" button has been pressed:



Rename Volumes

Volumes can have their previously-assigned friendly names changed by using the "Rename Volume" page.

To change the friendly name of a volume, type the new name into the respective text box. You can change the name of more than one volume at a time. When you have made the changes, click the "Save Settings" button to confirm. The friendly name aids user identification of the volume and can be used to help remember what the volume is being used for.



Map Volume

In order for a volume to be available to a host system, each volume must be mapped to a Logical Unit Number (LUN) on at least one host port so that the host can see it on that port. Current mappings are shown on this page, but if there is a need to change the mappings, press the "Next" button.



After the "Next" button is clicked, you will see a new page as follows:



Use the drop down menus for each volume to select the LUN for each host port. A volume can be assigned to a LUN with a value between 0 and 254, if not already in use. Selecting UNMAPPED will make the corresponding volume unavailable to all attached host systems on the corresponding host port. If there are identical LUNs on a host port at least one will be automatically set to UNMAPPED when "Save Settings" is clicked. This is done in order to allow the configuration to succeed. It is important that each LUN is unique per host port.

NOTE – there are LUN mapping scenarios where additional host software is required. If a volume is mapped to both host ports and your host is connected to both ports it is likely two volumes or LUNs will be visible from your host. It is important to understand this represents two communication paths to the single mapped volume. If this configuration is required then Multipathing Software must be used to correctly combine the paths and provide path failover should one of the communication paths fail. If the same volume is visible to two separate host systems then file locking software must be used to ensure data is not corrupted. If you are unsure, then contact Technical Support.

At this point you can also apply host access rights. Setting a group to "Default" will use access rights from the global default. Setting a host to "Default" will use access rights from the group it is a member of (or from the global default if no specific group access is set).

The icon next to each host indicates whether that host is connected to a mapped port. Hover the mouse cursor over an icon to see a tooltip with additional details. If JavaScript is enabled, the icons will update dynamically as the settings are adjusted; otherwise, the icons will only be updated after the changes are applied.

Click the "Apply Changes" button to save the mappings and access rights.

NOTE – Changes are made immediately, so changing the LUN of a volume in use could cause your Operating System to crash or lose communication with the volume.

Configure Host Access

Configure Fibre

In order to ensure correct operation of the Fiber Channel interface you should use the web GUI to review and / or alter the Fiber Channel settings. If your system is a version utilizing a "SAS to Host" interface instead of Fiber Channel, please refer to the "Configure SAS" section.

From the Main Menu on the left side, select "Config Host Access". When the page reloads, click "Fibre" from the row of tabs at the top of the page. The Fibre page allows the configuration of both Fibre Ports on each controller. Use the drop down menus to configure the settings.

😭 Storage Manager - [Nexsan RAID Storage\Favorites\YELLOW SATABeast #1]								
File Action View Help								
Home						- ^		
RAID Information	Fibre iSCSI G	roups Hosts	Access	_				
System Information		Con	figure Host Ac Configure Fibr	cess	0			
Configure RAID			comgare ribr	C				
Configure Volumes	Controller 0	Fibre	e - Host O	Fibro	e - Host 1			
Config Host Access 🕟		Current status	New state	Current status	New state	=		
Power Settings	Topology	P2P, full fabric	AUTO -	P2P, full fabric	AUTO -			
System Admin	Loop ID	?(N.A)	AUTO -	?(N.A)	AUTO -			
Configure Network	Link speed	2Gbit	AUTO -	2Gbit	AUTO -			
Quick Start	Auto port logout	Yes	Yes 💌	Yes	Yes 💌			
Technical Support	Controller 1	Fibre	e - Host O	Fibro	e - Host 1			
Log Off		Current status	New state	Current status	New state			
	Topology	P2P, full fabric	AUTO -	P2P, full fabric	AUTO 💌			
	Loop ID	?(N.A)	AUTO -	?(N.A)	AUTO -			
	Link speed	2Gbit	AUTO 👻	2Gbit	AUTO -			
	Auto port logout	Yes	Yes -	Yes	Yes 💌			
	Save Co	onfiguration	Save and Ap	oply Changes	Reset			

The information displayed is as follows:

Topology – allows you to select between Point-to-point, Loop or Auto topologies. The loop topology should be used when connecting to other devices using a hub. Point-to-point is normally used when connecting directly to an initiator HBA or a fabric switch. The Auto mode will try to negotiate what topology to use. First it will try to connect to a loop. If this fails it will try to connect using Point-to-point mode. Auto may not always work, especially if the device(s) at the other end are also using auto.

Loop ID – selects the ID of this port. Use the drop down menu to select an address between 0 and 126. Auto may also be selected to find an address that is not already occupied. Loop ID does not need to be set if you are running in Point-to-point mode.

Link Speed – denotes the speed of the connection. The unit is capable of running at either 1Gbit/s (One Gigabit per second) or 2Gbit/s (Two Gigabits per second). Some versions also support 4Gb/s operation. You should set the speed depending on your other Fiber Channel equipment. It is also possible to use Auto mode to attempt auto-negotiation of the correct speed, but not all third-party equipment supports this properly.

Frame Size – chooses the frame size to be used. The frame size relates to the data payload of each packet. Typically the larger the payload the more data can be transmitted, with less overhead. The available frame sizes are 512, 1024, 2048 and 2112. Note that in some version of firmware this function is not available.

Host port cleanup – This option is only used in full-fabric topologies. It should be cleared whenever RSCN notification has been disabled on the connecting fabric switch, otherwise it can lead to incorrect deregistering of host ports. This option is enabled by default. Note that in some version of firmware this function is not available.

After all the interfaces have been configured click the "Save new configuration".

NOTE – The settings will be applied at the next restart of the system.

Configure SAS

SAS (Serial Attached SCSI) is not only applicable to certain types of disk drives, but is a protocol and cabling standard that allows for entire systems to be connected to host at relatively low cost. Some Nexsan controllers such as the "SATABoy2-SH" use SAS connectivity instead of Fiber Channel. This controller type uses two 26-way mini-SAS connectors, suitable for use with external copper-bases cables up to around 8 metres in length (this will vary with speed and cable and connector quality), terminated with SFF-8088 mini-SAS 'plugs'. Each connector contains 4-lanes of SAS, with 3Gb/s full-duplex capability on each lane, equating to 12Gb/s per connector. Nexsan have tested various cables and recommend a *maximum of 4 metres*, which should be fine for most racks.

😤 Storage Manager - [Nexsan RAID Storage\Other Systems\SATABoy2-SH - SAS Host RAID subsystem, number - 000402D413C4]							
File Action View Help							
Home						<u>^</u>	
RAID Information	SAS iSCSI Groups	s Hosts Acc	ess	_	_		
System Information		Confi	gure Host Acce	ess			
Configure RAID							
Configure Volumes							
Config Host Access 🕠							
System Admin							
Configure Network	Controller 0	Hos	t Port 0	Hos	t Port 1		
Quick Start		Current status	New state	Current status	New state		
Technical Support	Wide port link speed	Port Down	AUTO -	Port Down	AUTO -		
Log Off	Phy 0 State	Down	Enabled 💌	Down	Enabled -		
	Phy 1 State	Down	Enabled 💌	Down	Enabled 💌		
	Phy 2 State	Down	Enabled 💌	Down	Enabled 💌		
	Phy 3 State	Down	Enabled 💌	Down	Enabled 💌		
	Controller 1	Hos	t Port 0	Hos	t Port 1		
		Current status	New state	Current status	New state		
	Wide port link speed	Port Down	AUTO -	Port Down	AUTO 💌		
	Phy 0 State	Down	Enabled 💌	Down	Enabled 💌		
	Phy 1 State	Down	Enabled 💌	Down	Enabled 💌		
	Phy 2 State	Down	Enabled 💌	Down	Enabled 💌		
	Phy 3 State	Down	Enabled 💌	Down	Enabled 💌		
		Save new	v configuration	Reset			

Wide port link speed - Use these settings to select the maximum link speed of the host connection. Select from 1.5Gb/s (150MB/s), 3Gb/s (300MB/s) or AUTO which will attempt to discover the data rate of the attached host or SAS device. This setting will apply to all the Phys in the Wide Port. Changes to this setting will take effect only after the RAID controller is rebooted.

Phy State - Use these settings to enable or disable an individual SAS physical link. Normally all 4 "phys" are enabled to create the wide port host connection which will provide a maximum transfer bandwidth. If required, individual phys can be disabled here, though this will reduce the maximum transfer bandwidth. Changes to this setting will take effect only after the RAID controller is rebooted.

Configure iSCSI

iSCSI is a mechanism to use IP frames, usually over Ethernet, as a means of transport for SCSI. SATABoy and SATABeast have 2 ports per controller running at 1Gb/s that can both be used for iSCSI. For added performance, jumbo frames can be used. It is possible to run iSCSI on a 10/100 network connection but performance will be significantly reduced. Nexsan iSCSI works only on communication port 3260.

CAUTION: While both network ports can be used for iSCSI, only Port 0 can be used for access to the unit's web-based GUI. The GUI access is usually infrequent and light, so when Port 0 is being used for both iSCSI and GUI access, the impact on speed is minimal.

NOTE: Nexsan's iSCSI implementation supports controller failover so long as you are using multipathing software on your host. Path Failover is supported by iSCSI, so should one port or link into a controller fail, the remaining port(s) will pick up the load and normal operation will continue.

More than one Initiator/Host can access the same volume, but be aware that clustering software would be needed to ensure data integrity. From firmware release xf66 onwards, the maximum number of concurrent sessions is 64 per controller and so 128 connections are possible on a dual controller unit. The maximum number of initiators supported in the Host Access list is 127 (note that a single initiator can connect to all four ports so creating 4 connections).

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Home	_					
RAID Information	Fibre	ISCSI Groups Hosts Access				
System Information		Configure Host Acces	55		(?	
Configure RAID		Configure 19031			0	
Configure Volumes			iscs	I - Net 0 is	SCSI - Net 1	
Config Host Access	Enable	iSCSI on Controller 0	0			
Power Settings	Enable	iSCSI on Controller 1	0			
rower settings		Apply				
System Admin		Анни				-
Configure Network	Remove	Host Name		Allow	Config	-
Quick Start		ign 1991-05 com microsoft:pexsan-z8jazzgi		Access	Advanced	
Technical Support		ign.1991-05.com.microsoft:dvt06-5201zdwc	1		Advanced	
Log Off		ian.1991-05.com.microsoft:kev-pc		v	Advanced	
		ign.1991-05.com.microsoft:super-server			Advanced	
		iqn.com.ibm.istc.szx1g205.hostid.09baf54f]		V	Advanced	
		iqn.com.ibm.istc.szx1g205.hostid.09baf54f		V	Advanced	
		iqn.2005-03.com.redhat:01.a27be8f824b0			Advanced	
		iqn.1991-05.com.microsoft:d9vszjc1		V	Advanced	
		iqn.1996-04.de.suse:01:aed39b25ae7b		~	Advanced	
		iqn.1996-04.de.suse:01:b886967a4d3a			Advanced	
		iqn.1991-05.com.microsoft:win-eqr0pia3nr2		V	Advanced	
		Default		•	Advanced	
		Apply Settings Reset	t			
				V		
		Add				Ŧ

As shown on the page above, choose which ports can be used to run iSCSI, and which hosts should be allowed access. Note that all previously discovered hosts are remembered in the list of hosts (so long as iSCSI has been running on at least one port). Any correctly set up host will attempt to discover iSCSI targets and will be seen by the storage unit, and will appear in the list of hosts. Host names can also be added manually. You should check or change the network port settings to get the most out of iSCSI – using 1G speed and jumbo frames is recommended, see "Network Settings".

By clicking on the "Advanced" text link in the page shown above, you can view or change the default login settings for each offline host, for items like authentication and the use of digests – see below:

😭 Storage Manager - [Nexsan R	AID Storage\Favorites\YELLOW SAT	ABeast #1]	_ D X
File Action View Help			
🗢 🔿 🖄 🖬 🛛 🖬			
le nexsan		ALCO-	<mark>√all ok</mark>
Home			^
RAID Information	Fibre iSCSI Groups I	Hosts Access	
System Information	¢	Configure Host Access Configure iSCSI	?
Configure RAID		comgure isesi	
Configure Volumes		Host Configuration	=
Config Host Access 🔸	Identity	iqn.1991-05.com.microsoft:nexsan-z8iazxgj	
Power Settings	Access	Allowed	
System Admin	Digest	🗆 Header Digest required	
Configure Network		Data Digest required	
Quick Start	CHAP authentication	• None O Target	
Technical Support		O Mutual	
Log Off	CHAP secret	O Use default host secrets	
		Use host unique secrets	
	Unique target secret		
	Unique host secret		
		Apply Settings Reset	

Finally, iSCSI ports must have Volumes mapped to them. This is done via the CONFIGURE VOLUMES menu, and then the Map Volume tab – see "<u>Map Volume</u>".

Groups

This page allows the user to configure access control groups. An access control group can be used to provide a number of hosts with a set of common access rights.



Pressing the "Add Group" button changes the page to add a group template.

Group #2 is the default name that is added for you to edit - see below:



Pressing the "Edit list" link will list a set of hosts (or none). Some hosts may have been seen by the unit in the past, and some may be currently connected (as depicted by a green dot – see below):

😭 Storage Manager - [Nexsan	RAID Storage\	Favorites\YEL	LOW SATABeast #1]	x
File Action View Help				
🗢 🔿 🖄 🖬 🚺				
	R	7		<u>L OK</u>
Home				<u>^</u>
RAID Information	Fibre i	ISCSI Gr	oups Hosts Access	
System Information	¢		Configure Host Access	
Configure RAID			Manage Groups	
Configure Volumes			Group #2	
Config Host Access	Include	Туре	Host Name	
comy nost Access		● iSCSI	Host #1 (iSCSI) iqn.1991-05.com.microsoft:nexsan-z8iazxgj	
Power Settings		iSCSI	Host #2 (iSCSI) iqn.1991-05.com.microsoft:dvt06-5201zdwc1	
System Admin		◎ iSCSI	Host #3 (iSCSI) iqn.1991-05.com.microsoft:kev-pc	E
Configure Network		■ iSCSI	Host #4 (iSCSI) iqn.1991-05.com.microsoft:super-server	
Quick Start		iscsi	Host #5 (iSCSI) iqn.com.ibm.istc.szx1g205.hostid.09baf54f]	
Technical Support		iscsi	Host #6 (iSCSI) iqn.com.ibm.istc.szx1g205.hostid.09baf54f	
		iscsi	Host #7 (iSCSI) iqn.2005-03.com.redhat:01.a27be8f824b0	
Log Off		● iSCSI	Host #8 (iSCSI) iqn.1991-05.com.microsoft:d9vszjc1	
		iscsi	Host #9 (iSCSI) iqn.1996-04.de.suse:01:aed39b25ae7b	
		iscsi	Host #10 (iSCSI) iqn.1996-04.de.suse:01:b886967a4d3a	
		iscsi	Host #11 (iSCSI) iqn.1991-05.com.microsoft:win-eqr0pia3nr2	
		Fibre	Host #12 (Fibre) WWPN: 2F-FC-00-C0-DD-03-DD-EC	
		Fibre	Host #13 (Fibre) WWPN: 21-03-00-E0-8B-7E-70-E4	
		\varTheta Fibre	Host 'Host #14 (Fibre) WWPN: 21-00-00-E0-8B-1E-70-E4 win2008 104'	
			Apply changes Reset	Ŧ

Simply select which hosts are members of the group "Group #2" in our example and press "Apply Changes". You can change the name of the group on the Manage Groups page, and press "Apply Changes".

Hosts

This page will show a list of all the hosts that have ever been seen by the storage unit. Hosts are automatically added to the list as they are discovered and will be given a default name and inherit access rights from "Default Access". The hosts can be Fibre-based or (not shown below) iSCSI-based.

Hosts can be renamed by typing in a new, friendly name over the discovered name. Hosts that are no longer relevant can be removed from the list by marking the "Remove" checkbox, and clicking on the "Apply changes" button. If you know the identity of the host, you can also add it manually to the list.

File Action View Help		11			
		1			
nexsan		7		•	
					<u>. OK</u>
Home					Â
RAID Information	Fibre	SCSI Gr	oups Hosts Access		
System Information			Configure Host Access Manage Hosts	?	
Configure RAID			g		
Configure Volumes	Remove	Туре	Host Name	Details	
Config Host Access 🕟			Group '2GB Switch'		
Power Settings		😑 Fibre	Host #14 (Fibre) WWPN: 21-00-00-E0-8B-1E-70-E4 win2008 104	Details	
System Admin			·		
Configure Network	_		Other Hosts	_	
Quick Start		0 iSCSI	Host#1 (iSCSI) iqn.1991-05.com.microsoft:nexsan-z8iazxgj	<u>Details</u>	Ε
Technical Support		0 iSCSI	Host #2 (iSCSI) iqn.1991-05.com.microsoft.dvt06-52o1zdwc1	<u>Details</u>	
Log Off		0 iSCSI	Host #3 (iSCSI) iqn.1991-05.com.microsoft.kev-pc	<u>Details</u>	
		0 iSCSI	Host #4 (iSCSI) iqn.1991-05.com.microsoft:super-server	Details	
		iscsi	Host #5 (iSCSI) iqn.com.ibm.istc.szx1g205.hostid.09baf54f]	<u>Details</u>	
		iscsi	Host #6 (iSCSI) iqn.com.ibm.istc.szx1g205.hostid.09baf54f	Details	
		iscsi	Host #7 (iSCSI) iqn.2005-03.com.redhat.01.a27be8f824b0	Details	
		iscsi	Host #8 (iSCSI) iqn.1991-05.com.microsoft:d9vszjc1	Details	
		iscsi	Host#9 (iSCSI) iqn.1996-04.de.suse:01:aed39b25ae7b	<u>Details</u>	
		iscsi	Host #10 (iSCSI) iqn.1996-04.de.suse:01:b886967a4d3a	<u>Details</u>	
		iscsi	Host#11 (iSCSI) iqn.1991-05.com.microsoft.win-eqr0pia3nr2	Details	
		Fibre	Host#12 (Fibre) WWPN: 2F-FC-00-C0-DD-03-DD-EC	Details	
		Fibre	Host #13 (Fibre) WWPN: 21-03-00-E0-8B-7E-70-E4	Details	
			Apply changes Reset		
		Fibre iscst	WWPN, iqn or eui	_	
			Add Host		Ŧ

The "Details" link shows detailed information about a host - see below:



Host Access Settings

For each host, you can choose the access rights it has with regard to accessing volumes that have been created. Hosts and groups of hosts acquire "Default" rights that you can override. Decide which host you want to change and click on the "Access" link.



After clicking on the "Access" link, the following page is displayed:



For each volume that is displayed in the list, you can select whether to Deny access, allow Read-Only access or full Read/Write access for the host.

Click "Apply Changes" when the host's rights have been set up.

Power Settings

Various power saving features can be obtained through the use of "AutoMAID" which is an optimisation that reduces the power consumed by disk drives when they are not being accessed. Once disks have entered a power saving mode, they are automatically brought back up to full speed if a disk access is necessary, but there may be a short delay in reading or writing data until the disks reach full speed.

NOTE – Not all hard disks support all of the AutoMAID options, some only supporting Level 3, or others only supporting 1 and 3, so the pull-down menus for the unsupported power options will not be shown. Some disk drive have internal algorithms that enable power saving, but these cannot be controlled from the GUI.

NOTE – AutoMAID works on a per-disk basis but within each RAID set (i.e. not at the system or volume level) in order to allow for different power saving profiles should different RAID sets have differing data traffic.

AutoMAID Stats

The AutoMAID Stats page provides a guide to the state of each of your configured RAID sets and spare disks, breaking down how much time has been spent in each AutoMAID state.



AutoMAID Config

The "AutoMAID Config" page allows setting a time after which each level of power saving becomes active. These modes or "MAID levels" become active after an array has had no activity for the configured time period. The time period is set via the pull-down menus in the "New Setting" column. The time periods for the different levels must be configured in ascending order from level 1. Thus, level 1 is enabled first then level 2 and finally level 3. If a particular power saving level is not required then select "never". After selecting the required power saving configuration click "Set AutoMAID Level". You can also set days of the week and time of day for periods when you don't want AutoMAID to be active.



System Admin

Cache Settings

The unit has a cache memory (512M to 2G depending on the model) which is normally enabled. The cache memory holds data being written to disk. This enables the controller to confirm that a command is completed before the data has been physically written. In the event of a power failure during an unfinished write operation, the cache has a battery backup to protect cached data for up to 72 hours. The unit's controller will automatically complete any unfinished write operations after power is restored.

😭 Storage Manager - [Nexsan RA	ID Storage\Favorites\YELLOW SATABeast #1]		_ 0 X
File Action View Help			
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nexsan	Carling ALCO		<mark>√all ok</mark>
Home	Cache Alarm Reboot Rebuild Verify	System Settings Update	^
RAID Information	Rate Config	Mode Firmware	
System Information	Syster	n Admin Ire Cache	?
Configure RAID	comga		E
Configure Volumes	Cache Co	nfiguration	
Config Host Access	Current write cache state	Enabled, Mirrored, FUA ignored - (C0) MB,(C1) 495 MB	495
Power Settings	Manually override current write cache status	□ Force write cache to Disabled	
System Admin 🕟	Desired write cache state	• Enabled	
Configure Network		C Disabled	
Quick Start	Allow attached host to override write cache configuration		
Technical Support	Ignore force unit access (FUA) bit		
Log Off	Enable cache mirroring		
	Write cache streaming mode		
	Read cache streaming mode		
	Cache optimization setting	 Random access Mixed sequential/random Sequential access 	
	Save Settin	gs Reset	

The information displayed is as follows:

Current write cache state - shows details about the current cache configuration being used.

Manually override current write cache status – will force the cache on or off without a reboot. Use the tick box if you wish to use this option.

Desired write cache status – choose the preferred cache state. Use the radio buttons to select Enable or Disable write cache.

Allow attached host to override write cache status – some SCSI commands will force the write cache not to be used. Click the tick box to override this.

Ignore Force Unit Access (FUA) bit – "Force Unit Access" (FUA) is part of the SCSI-3 block device (SBC) specification and Support for FUA is optional. RAID subsystems and host controllers, particularly ones with battery backup, may choose to ignore FUA. When the FUA (Force Unit Access) bit is set by a host system

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on a per command basis, data is written and read directly to and from the disks without using the onboard cache. This will incur a time overhead, but guarantees the data is written to the disks. Set this option to force the controller to ignore the FUA bit so that command execution times are more consistent, but note that performance is normally improved by ignoring the FUA bit.

Write cache streaming mode – When the write cache streaming mode is enabled, the system continuously flushes the cache. This provides maximum cache buffering to protect against RAID system delays adversely affecting command response times to the host. When the write cache is in non-streaming mode, the system runs with a full write cache to maximise cache hits and maximise random IO performance.

Cache Optimization Setting – use these radio buttons to tune the access performance of the cache. If your host system is accessing a large number of different files or different areas of a volume then selecting "random access" may improve host performance. A file server with a large number of users or a database may produce this type of access pattern. If your host system is accessing a small number of large files sequentially then selecting sequential access may improve host performance. Streaming video may produce this type of access pattern. If there is a mixture of sequential and random access then selecting the "Mixed sequential / random" option may improve overall performance. Experimenting with these options is permissible in order to determine which is best for your host system.

NOTE – The write cache will be flushed 5 seconds after the last host write, it is recommended for a shutdown all host activity is stopped and then wait 30 seconds before powering off this system.

Once you have made the required changes hit the "Save settings" button to continue.

Audible Alarm

The audible alarm, which will normally sound in the event of a problem, can be enabled or disabled on this page.



The information displayed is as follows:

Silence The Audible Alarm – By clicking this button the audible alarm will be silenced.

NOTE - This does not solve the problem that caused the alarm to sound.

Re-Sound The Audible Alarm – click this button to re-enable the audible alarm.

Reboot

The Reboot page allows the system or a controller to be restarted or shutdown without physical contact with the device. There are several modes.



The information displayed is as follows:

Rolling Restart

Rolling Restart is a feature that lets you perform controller restarts (warm boots) without losing host connectivity or data transfer. It is a "host-transparent restart".

During the Rolling Restart process, each controller will reboot in turn. The status of the controllers will be shown on the GUI and in the event log. IP and host connectivity will stop briefly at various stages during the Rolling Restart process, but should resume shortly afterwards (in less than 30 seconds). Host timeouts should be set (at the host) to ensure that this does not cause any application errors. See "Host Time-outs".

To perform a Rolling Restart, both controllers must be fully operational, the uploaded firmware on both controllers must be the same, and the system must be in an Active-Active mode (2PAA, 4PAA, or APAL – see "

System Mode (Failover Settings)").

If the system is not in a suitable state for Rolling Restart, the option will be greyed-out on the GUI (except on single controller systems, where the "<u>Rolling Restart</u>" option is not shown on the "<u>Reboot</u>" page and is not available).

System Reboot

Select the "System Reboot" radio button and click the "Execute NOW" button to reboot the unit. While the unit is rebooting the configured arrays and volumes will not be accessible from your attached host system(s), before this function is used it is advised that all host IO is ceased. You may also need to reboot your host system(s) after the RAID controller has rebooted.

System Shutdown

Select the "System Shutdown" radio button and click the "Execute NOW" button to shutdown the unit, this will ensure all the cache data is flushed to the disks, when the unit is put into a shutdown state your host system(s) will not be able to access any of the configured volumes.

When two controllers are installed Reboot and Shutdown will apply to both controllers.

Rebuild Rate Settings

The Rebuild Rate page can be used to select the amount of IO time dedicated to rebuilding a critical array. If your host activity is high then a higher rebuild priority may need to be selected so the array rebuild completes in a shorter time. The disadvantage of doing this is that less time will be dedicated to providing your host with data and potentially reducing host data throughput. Bear in mind that your data is vulnerable while an array is critical. Depending on RAID level, any further disk failures could mean your data becomes unavailable to your host i.e. RAID array goes offline.

To configure a new rebuild rate, select the appropriate radio button, and then click "Set Rebuild Priority".



Verify Configuration

The Verify Configuration page allows the user to specify what type of verification should be carried out on any configured RAID arrays and how often, in order to identify problems and maintain the unit in perfect condition.



The information displayed is as follows:

Select verify utility to use – Select "surface scan" or "parity scrub" for the next array verify utility. The selected utility will execute after verify interval has expired. Surface scan uses up very little array IO time. Surface scanning will make sure all data blocks on all array disks can be read. Parity scrub takes much longer and will read all the array data and make sure the parity (redundant) data is intact. Any parity

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inconsistencies will be corrected. Both utilities will correct (where possible) blocks that cannot be read, by using the parity data to rebuild the missing data onto a remapped block. Only one verify utility can be active at any one time for performance reasons. Multiple array configurations are verified one at a time. Press "Save Settings" to implement your choice.

Verify Interval – Use the above settings to set the amount of time between an array verify.

Verify Schedule – Use this to set up a convenient start day and time for verification. For many users, starting this in a quiet period is best, such as on a Friday night or some other day over the weekend.

Execute verify utility NOW - click this button to run the selected utility immediately.

Stop Verification – click this button to abort the running verification utility.

System Mode (Failover Settings)

In a dual controller system, there are a number of configurations that can be used depending on whether you are using switches, multiple host ports and/or host-based multi-pathing software:

- Dual Controller Non-Redundant (DCNR)
- 2-port Active-Active (2PAA)
- 4-port Active-Active (4PAA)
- All Ports All LUNs (APAL)

2PAA - Each controller has one active port (which presents storage volumes), and one passive port (which does little more than link up to indicate a good fibre link). The host is connected via a fibre switch to both active and passive ports. If a controller fails, RAID arrays (and their volumes) are moved to the alternate controller and the surviving passive fibre port assumes the WWPN of the failed active port. The host sees a fibre port go offline, then come back online. The fibre switch hides the fact that the new port has come from a different controller. Note that 2PAA does not provide multiple paths to the storage.

4PAA – This is a 4-port version of 2PAA. In 4PAA mode both fibre ports are active at all times on each controller. Storage volumes are presented to the host from the controller owning the RAID array, via its two fibre ports. Volumes cannot be mapped across controllers in this mode. If a controller fails, the surviving controller takes one of its fibre ports offline and brings it back up with the WWPN of one of the failed controller fibre ports. Note that 4PAA requires multipathing software to handle multiple paths to the storage, but not to manage failover as this is transparent to the host.

APAL - In APAL mode it is possible to map any volume to one or all fibre ports. Typically a user will map all volumes to all ports. Nexsan uses ALUA as described in SCSI SPC3 to define "optimized" (RAID array is owned by this controller) and "non-optimized" (RAID array is owned by the other controller) paths. If a controller fails, the host will see 2 paths fail, but the remaining controller will provide 2 remaining paths to the storage. APAL requires host software to handle multipathing and path failure and fail-back.

NOTE - 2PAA and 4PAA modes are not supported for iSCSI connections.

NOTE - For dual-controller systems, the recommended system mode is **All Ports All LUNs (APAL)**. This mode provides the greatest flexibility and protection. Note that with iSCSI, failover is only supported in All Ports All LUNs (APAL) mode.

😭 Storage Manager - [Nexsan	🖗 Storage Manager - [Nexsan RAID Storage\Favorites\YELLOW SATABeast #1]					
File Action View Help						
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nexsan	A THERE ALCO	<mark>√all ok</mark>				
Home	Debuild Marife Custom Under	^				
RAID Information	Cache Alarm Reboot Rate Config Mode Settings Update					
System Information	System Admin System Mode	2				
Configure RAID						
Configure Volumes	System Mode					
Config Host Access	Single Controller mode					
Demos Cottines	Dual Controller Non-Redundant mode (DCNR)					
Power Settings	2-port Active-Active mode (2 ports active)					
System Admin 🔹 🕟	4-port Active-Active mode (4 ports active)					
Configure Network	All Ports All LUNs mode (4 ports active)					
Quick Start	Save System Mode					
Technical Support						
Log Off						
		T				

Dual Controller Non-Redundant mode (DCNR)

4

When this mode is selected, array failover will not take place when a controller fails, but aggregate performance can be improved by using this mode.

Requirements/restrictions:

- Active Ports:
- Nodes: 2
- Fibre Switch: Optional
- Host MPIO Support: Optional

Each controller operates as an independent node. Volumes can only be mapped to ports on the owning controller, and will become inaccessible if the controller fails. Note port names in the table below:

Controller 0	Fibre - Host 0	Fibre - Host 1		
Fibre Port Name	xx-xx-xx- 20- xx-xx-xx-xx	xx-xx-xx- 21- xx-xx-xx-xx		
Fibre Node Name	20- xx-xx-xx-xx-xx-xx	20- XX-XX-XX-XX-XX-XX-XX		
Controller 1	Fibre - Host 0	Fibre - Host 1		
Fibre Port Name	xx-xx-xx- 22- xx-xx-xx-xx	xx-xx-xx-23-xx-xx-xx-xx		
Fibre Node Name	21- xx-xx-xx-xx-xx-xx-xx	21- xx-xx-xx-xx-xx-xx-xx		

2-port Active-Active (2PAA)

When this mode is selected volumes will be presented on one host port, a controller failure will result in the volumes being presented on the passive port on the other controller. This mode has no requirement for path failure software on the host. Note that both passive and active ports must be connected to the host system.

Requirements/restrictions:

- Active Ports: 2
- Nodes: 2
- Fibre Switch: Required
- Host MPIO Support: No

In this mode, each controller operates as an independent node. Volumes can only be mapped to 1 port on the owning controller. Port 0 on both controllers should be connected to a common fibre zone. Similarly, port 1 on both controllers should be connected to a common fibre zone. If a controller fails, the passive port on the surviving controller takes on the WWPN and WWNN of the failed port, allowing host I/O to continue.

Normal operation (passive ports are greyed out):

Controller 0	Fibre - Host 0	Fibre - Host 1	
Fibre Port Name	xx-xx-xx-20-xx-xx-xx-xx	xx-xx-xx-21-xx-xx-xx	
Fibre Node Name	20- xx-xx-xx-xx-xx-xx-xx	20-xx-xx-xx-xx-xx-xx-xx	
Controller 1	Fibre - Host 0	Fibre - Host 1	
Fibre Port Name	xx-xx-xx-22-xx-xx-xx-xx	xx-xx-xx- 23- xx-xx-xx-xx	
Fibre Node Name	21-xx-xx-xx-xx-xx-xx	21- xx-xx-xx-xx-xx-xx-xx	

After failover (e.g. controller 0 failed) - Port0 on controller 0 has moved to Port1 on controller 1.

Controller 0	Fibre - Host 0	Fibre - Host 1		
(FAILED)				
Controller 1 Fibre - Host 0		Fibre - Host 1		
Fibre Port Name	xx-xx-xx-20-xx-xx-xx-xx	xx-xx-xx-23-xx-xx-xx-xx		
Fibre Node Name	20- xx-xx-xx-xx-xx-xx	21- xx-xx-xx-xx-xx-xx		

4-port Active-Active (4PAA)

When this mode is selected, volumes will be presented on both host ports. A controller failure will result in the volumes from the failed controller being presented on one of the ports on the other controller. This mode will present two paths to the configured volumes, so your host must have software to cope with a path failure for this mode to be used correctly.

Requirements/restrictions:

- Active Ports: 4
- Nodes: 2
- Fibre Switch: Required
- Host MPIO Support: Required

In this mode, each controller operates as an independent node. Volumes are mapped to both ports on the owning controller. Port 0 on both controllers should be connected to a common fibre zone. Similarly, port 1 on both controllers should be connected to a common fibre zone.

If a controller fails, one of the ports on the surviving controller takes on the WWPN and WWNN of one of the failed ports, allowing host I/O to continue. (If controller 0 fails, this will be controller 1 port 0; if controller 1 fails, this will be controller 0 port 1). Normal operation:

Controller 0	Fibre - Host 0	Fibre - Host 1		
Fibre Port Name	xx-xx-xx- 20- xx-xx-xx-xx	xx-xx-xx- 21- xx-xx-xx-xx		
Fibre Node Name	20- xx-xx-xx-xx-xx-xx	20- xx-xx-xx-xx-xx-xx		
Controller 1	Fibre - Host 0	Fibre - Host 1		
Fibre Port Name	xx-xx-xx-22-xx-xx-xx-xx	xx-xx-xx-23-xx-xx-xx-xx		
Fibre Node Name	21- xx-xx-xx-xx-xx-xx	21- xx-xx-xx-xx-xx-xx		

After failover (e.g. controller 0 failed):

Controller 0	Fibre - Host 0	Fibre - Host 1
	(FAILED)	
Controller 1	Fibre - Host 0	Fibre - Host 1
Fibre Port Name	xx-xx-xx-20-xx-xx-xx-xx	xx-xx-xx-23-xx-xx-xx-xx
Fibre Node Name	20- xx-xx-xx-xx-xx-xx	21- xx-xx-xx-xx-xx-xx

All Ports All LUNs (APAL)

When this mode is selected, volumes can be mapped on all host ports on both controllers. A controller failure will result in volumes mapped exclusively to ports on that controller becoming inaccessible. This mode can present up to four paths to the configured volumes; your host must have software to cope with a path failure for this mode to be used correctly.

Requirements/restrictions:

- Active Ports: 4
- Nodes: 1
- Fibre Switch: Optional
- Host MPIO Support: Required

In this mode, the entire system operates as a single node. Volumes can be mapped individually to any/all ports on both controllers.

When a controller fails, the ports on that controller become inaccessible. However, if the volumes are mapped through the other controller also, they will remain accessible to the host. The WWPN and WWNN of the ports do not change.

Normal operation:

Controller 0	Fibre - Host 0	Fibre - Host 1		
Fibre Port Name	xx-xx- 20- xx-xx-xx-xx	xx-xx- 21- xx-xx-xx		
Fibre Node Name	20- xx-xx-xx-xx-xx-xx-xx	20- xx-xx-xx-xx-xx-xx		
Controller 1	Fibre - Host 0	Fibre - Host 1		
Fibre Port Name	xx-xx-xx-22-xx-xx-xx-xx	xx-xx-xx-23-xx-xx-xx		
Fibre Node Name	20- xx-xx-xx-xx-xx-xx-xx	20- xx-xx-xx-xx-xx-xx		

After failover (e.g. controller 0 failed):

Controller 0 Fibre - Host 0		Fibre - Host 1		
(FAILED)				
Controller 1	Fibre - Host 0	Fibre - Host 1		
Fibre Port Name	xx-xx-xx-22-xx-xx-xx-xx	xx-xx-xx-23-xx-xx-xx-		
Fibre Node Name	20- xx-xx-xx-xx-xx-xx-xx	20- xx-xx-xx-xx-xx-xx-xx		

Settings

You can download or upload a settings file from/to the unit that contains the setup information.

The settings file will be automatically installed after a successful upload. Make sure you have selected the correct file, and note that some of the installed settings will only take effect after a system restart.

The settings file can be manually changed. Therefore, depending on the contents of the "settings" file, the network IP address and other network settings may be changed, if the network settings are not correct this may result in the web GUI not being accessible. Check all network address settings before restarting.



Update Firmware

From time to time Nexsan will release new firmware to introduce new features and/or to solve firmware related issues. The firmware is released as an image file (often zipped) and it must be unzipped if necessary and uploaded to the storage unit. Once uploaded, it resides on a PROM (Programmable Read Only Memory) chip located on the controller.

The Update Firmware page is the recommended mechanism to change the unit's firmware. Simply use the browse button to locate the (unzipped) file on your local PC, and then press the "Upload Firmware" button. Unless you are in an active-active mode and plan to use rolling restarts, firmware uploads must be done when there is no host activity and all data has been flushed to disk.



NOTE – Web-GUI management will only be available through Ethernet port 0. Ensure that Net 0 port is connected and configured. Also, with firmware xx60 and above, a dual controller system will automatically update both controllers.

Once the upgrade process is started, the GUI will display a progress bar. When it reaches 100%, the controller upload process is complete See below:

This sy	stem is currently updating firm	nware		
DO	NOT switch this system	off		
When the firmware update has finished you will then be granted access to the GUI, after returning to the GUI double check the microcode updated status by checking the event log for the 'Microcode Updated OK' message. If this message is <u>NOT</u> found at the top of the event log DO NOT switch this system off, contact technical support.				
	on your browser to see the current status.			
	Current progress : 0%			
0%		100%		

When the firmware upload has completed, the following page is displayed:



A reboot is then needed to run the new firmware - see "Reboot".

There are various ways to reboot, but using the rolling restart feature is recommended if the unit is live and running in active-active mode.

The sequence of steps to perform an on-line firmware upgrade using the rolling restart feature is as follows:

- Ensure both controllers are up and running.
- Upload firmware to either controller (not both). The ROMs on both controllers are automatically updated with the new firmware, but nothing else changes at this point. The uploaded firmware version will appear on the Reboot page and the System Information page.
- Select Rolling Restart on the Reboot page and click "Execute NOW" to begin the process.
- The slave controller (normally Controller 1 after a cold boot) stops both of its fibre interfaces and flushes its write cache. When the flush is complete, the slave's arrays and WWN are failed over to the master and host I/O resumes. Host I/O to the master's WWN is maintained throughout this process.
- The slave controller reboots and performs its local initialization, using the new firmware.
- The master controller stops its fibre interfaces and flushes its write cache. When the flush is complete the controller is killed, and the other controller becomes the new master. During this period, all host I/O to both WWNs is suspended.
- The new master completes its start-up, and immediately services all host I/O to both WWNs to resume.
- The new slave then reboots and performs its local initialization, using the new firmware. The new master synchronises information about the current system state to the new slave.
- The new master then stops the failed-over fibre interface, flushes any write data for failed over arrays, and allows the new slave to enable its fibre ports.
- The system is now fully rebooted and running the new firmware, with all arrays on their default controllers.

Configure Network

Network Settings

This page displays all the current settings for the network ports, and lets the user change any parameter.



NOTE – On the page shown above and throughout the system, the "Net 0" port must be used for the GUI. iSCSI capability is however available on both network ports.

The information displayed is as follows:

Current Status - This reflects current port settings.

Port Settings – Decide if you wish to use auto-negotiation or if this is not fully supported on your LAN switch, you can force various speeds and duplex modes.

Hostname – Enter a hostname for the controller if the default values are not acceptable.

Assign IP address – First select whether to use DHCP (Dynamic Host Configuration Protocol) or to manually set the IP addresses. Use the radio buttons to select the desired option. If you select DHCP then no further configuration is needed. If DHCP is selected it is recommended that a static IP address is configured on your DHCP server for storage products. Assuming you have chosen to set up the network manually, enter an unused IP address into the text box. The IP address that you already have may be fine.

Static IP Address – If you do not use DHCP, you must enter a valid IP address.

Subnet mask – Set the subnet mask that fits the class of your network. In most cases 255.255.255.0 is acceptable. Type the new subnet mask into the text box.

Gateway - Type the IP address of your default gateway into this text box.

Primary/Secondary DNS – Type the IP addresses of both your Primary and Secondary DNS into the respective text boxes, DNS settings are only needed if you enter a domain name for your email server.

Repeat this process for each port on each controller.

After making changes to any of the above settings click the "Save Configuration" button – the settings will be implemented on the next reboot. To make the changes take effect without a reboot, click the "Save & Apply Changes" button.

E-Alerts

The storage unit has the capability of sending an email to specified email addresses in the event of a warning condition, an error condition or any new event.

The unit's firmware continually monitors the overall health of the system including RAID array status, environmental status, PSU and blower status. Any problems detected will result in an event log entry and the potential sending of an E-alert and / or a SNMP trap depending on the configuration.

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File Action View Help						
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Home	Network F-Alert SNMP	Date & Security SSI GUI	- Â			
RAID Information	Settings Syslog	Time Security Ster Settings				
System Information		E - Alert Settings	?			
Configure RAID		5				
Configure Volumes		E - Alert Configuration				
Config Host Access	Sender email address	nexsanstore@example.com				
Power Settings	SMTP email server	smtp.example.com	=			
System Admin	Recipient email address	storageadmin@example.com				
ConfigureNetwork 🕞	Recipient email address 2					
Quick Start	Recipient email address 3					
Technical Support	Recipient email address	Recipient email address				
Log off	RAID system friendly name YELLOW SATABeast #1					
	When to send Do not send email alarms					
	Send automatic status emails	Disabled 💌				
	Status email formatting	Send as MIME attachment 💌				
	Save E - Alert Settings Reset					
		Test E - Alert Settinas				
	Send Test	Email Now to storageadmin@example.com				
	Current emailer status	Email send queue is empty (Error: unable to resolve ma	il-server)			
		Clear Email Queue				
		All queued emails will be deleted / lost.				
	•					

There are four types of events generated by the unit. The "when to send" setting will determine what events are sent as E-Alerts.

Information events, these are purely for user information, for example showing disk details when the unit is powered up.

System events, these are similar to information events yet may be of less use to a user and are normally generated from low level system operations, for example showing fibre port status.

Warning events, these are problems that a user needs to be aware of that may indicate an imminent problem or a failure. Warning events are unlikely to compromise data availability, for example changing of the IP address assigned by DHCP.

Error events, these are serious problems that will most likely require user intervention and may indicate your data is at risk, for example a failed disk.

The information displayed is as follows:

Sender email address – is the email address of the sender that the unit uses. You may consider using Alert@yourdomain.com or storage_status@yourdomain.com. To set the sender, type the address into the text box. You may want to have a unique sender address for each storage unit.

SMTP email server – is the IP address or name of your mail server. You can only type the name of your mail server (i.e. mail.mydomain.com) if you have DNS correctly set up either manually or via DHCP. If DNS has not been configured then you will have to enter the IP address of your email server, since there would no means to resolve the name into an IP address. Enter the value into the supplied text box.

Recipient email address1, 2, 3, 4 – these are the email addresses that the unit should send email to. These would typically be addresses of system administrators. Type the recipient email addresses into the text boxes. Each text box has a maximum character space of 64 characters. If you have more than 4 email addresses that need to receive E-Alerts then this can be achieved by separating the email addresses with a semicolon.

RAID system friendly name – is an easy way to determine the location of the unit that has sent email. This feature is mainly useful for users with many systems, this can be set to a name that relates to the location or use of the unit i.e. Server1 RAID. Type the desired value into the text box.

When to send – decides under what circumstances an email should be sent. There are four possible options. "Don't send Email alarms" will not send any emails, this option is only recommended for users who do not wish to receive any emails from the unit and will be able to hear audible alarm should a problem occur. "Send Email alarms for errors only" will send an email only when errors occur. This setting is suitable for most users. "Send Email alarms for warnings and errors" will send email when warnings or errors occur; this is ideal for expert users. "Send Email alarms for all events" will send email when any new event is put into the event log, this option can generate a lot of emails yet is ideal for users that want to monitor the unit closely. Use the drop down menu to choose the desired option.

Send automatic status emails – use the pull down menu to configure how often the unit should send a status email, this email contains a summary of the system status and lets a user know the unit is up and running. When set to "Disabled" no status emails will be sent.

Status email formatting – determines whether the event log is sent as an attachment, or is embedded as a plain-text email.

Save E-Alert Settings – When you have completed the setup, click this button. You may reload this page and use the "Send test email now" to check that the configuration works.

Reset – If you think the settings you have entered are wrong, and you haven't yet saved the settings, this button can be used to revert to the previous settings.

Send Test Email Now button – use this to test your email settings, by clicking this button a test email will be generated and sent, if there is a problem with your email or network configuration the email will be queued and not sent.

Current emailer status – this shows if any emails in the email queue are waiting to be sent. Emails are queued up in memory to ensure they are always sent even if your network or email server is busy or not available. A status of "ready" indicates that all emails have been sent.

SNMP and SYSLOG Settings

The unit is capable of sending SNMP traps to a SNMP Network Management Station. Messages can also be sent to a SYSLOG server. Both of these mechanisms can be used to warn of, and record certain system events.

CAUTION – SNMP and SYSLOG both use UDP messaging which does not have guaranteed delivery. You may miss critical messages concerning the storage unit.

NOTE – For SNMP trap receivers, you will have to parse the trap MIB (Management Information Base) into your application. At the bottom of the page, in the Help section, you can download the MIB for SNMP V1 and V2c, by clicking on the link. Also, note that only Traps are available under SNMP – there is no general SNMP management capability in the unit.



The information displayed is as follows:

SNMP server IP address – this should be set to the IP address of the remote management station that will receive SNMP traps.

Community string – this must be set to the community string that your network management station is expecting to receive. This is often set to "public".

Trap version – select the trap version according to what version of trap your network management station is capable of receiving.

When to send a SNMP trap – select under what conditions the unit will send an SNMP trap. The choices are:

- Never send a trap
- For errors
- For warnings
- For all events

SYSLOG server IP address – this should be set to the IP address of the remote management station that will receive SYSLOG events.

SYSLOG server UDP port – this is normally UDP port 514. If your server is listening on a different port, use that port number instead.

SYSLOG Facility – SYSLOG Facility is one information field associated with a SYSLOG message. It is defined by the SYSLOG protocol. It is meant to show from what part of a system the message originated from. Under UNIX, there are facilities like KERN (the OS kernel itself), LPD (the line printer daemon) and so on. There are also the LOCAL_0 to LOCAL_7 facilities, which were traditionally reserved for administrator and application use. Select one of these.

When to send a SYSLOG messages – select under what conditions the unit will send a SYSLOG message. The choices are: Never send a trap For errors

For warnings For all events

To send a test trap enter a test string into "test string" text box, then click the "Test SNMP" button.

To send a test SYSLOG message enter a test string into "test string" text box, then click the "Test SYSLOG" button.

Date and Time Settings

The storage unit has a real time clock. It is important to set the Date and Time so that new events and emails show the correct time. From the main menu click on the "<u>Configure Network</u>" menu item, click the tab marked "Date + Time" to see the following page:



There are two ways to set a Date and Time, either manually or automatically:

To Set the Time and Date Manually:

- **Time entered in 'hh:mm:ss' format –** input the time into this field in the specified format. Please note that the time entered will not increase; the time you type in will only be used from the time you click the "Save Settings" button, not from when you typed it.
- **Date** entered via the dropdown selections.
- Time zone relative to GMT (GMT offset) use the drop down menu to select the time zone.

When you have made these changes click the "Save Settings" button.

To Set the Time and Date Automatically:

- Set system time and date by the timer server every 24 hours check the tick box if you wish the time and date to be set by the configured daytime server every 24 hours.
- Time server IP address to use for auto time and date configure allows you to select a predefined time server from the drop down menu or a custom time server for automatic time and date configuration. Use the radio buttons to decide which mode to use. You must specify the address of a time server to get automatic time updates.
- **Time server time and date format –** is a drop down menu that allows you to select the format of the data that will be received from the daytime server. Choose this carefully as many time servers use different settings. If you are unsure of the time format your daytime server is sending click "Retrieve Daytime Server Data", below this button you will see the data the daytime server sent. Select from the pull down menu the format that matches this data.

When you have made these changes click the "Save Settings" button.

Supported daytime server formats may be seen on the Help section at the lower section of the page.

Note that the system IP address and gateway IP address must be configured correctly before a daytime server can be successfully contacted. Two time-setting protocols are supported – Daytime and Simple Network Time Protocol (SNTP). Both function in a similar manner – retrieving the current time from a remote server. Daytime (RFC867) is a TCP protocol (tcp/13) whereas SNTP is UDP-based (udp/123).

Under the daytime system, when the time server IP address source is from the static list you will be forced to use NIST time and date format, if you select to use a manually entered IP address then you will be able to select the time and date format from the pull down menu. Note that you need to know what time and date format your daytime server is using before selecting from this menu, do this by clicking the "Retrieve Daytime Server Data" button to see the data returned from your daytime server. From this data you should be able to select the appropriate format from the pull down menu. If the format is incorrect then the system time will most likely not be set due to out of range time or date values.

Under SNTP, the packet format is fixed, and so the server format is ignored.

The GMT offset must be configured correctly in order for the system time and date to be set correctly by contacting a timeserver, the GMT offset is set manually and must be altered manually inline with daylight saving hours.

Security Settings

The storage unit offers two levels of security, User and Administrator. The USER account allows you to browse information pages and check on the general status of the product. The ADMIN access allows you to make configuration changes. By default the password login for ADMIN is turned off. The default password for USER and ADMIN is PASSWORD. The default password and usernames must be entered in UPPERCASE.

WARNING: RESETTING TO FACTORY DEFAULTS WILL RESET THE PASSWORDS.

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File Action View Help		
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(e) nexsan		JALL OK
Home	Network SNMP_ Date &	
RAID Information	Settings E-Alert Syslog Time Security	SSL Settings
System Information	Config Passwor	Jure Network () d Configuration
Configure RAID	1 455 11 01	a comgaraton
Configure Volumes	Admin	istrator access
Config Host Access	Current 'ADMIN' login password requirement	Security disabled - login password NOT required
Power Settings	Change 'ADMIN' login password	C Required
System Admin	requirement to	• NOT Required
System Admin	Login user name is fixed to	ADMIN
Configure Network >	New Password	Not Required
Quick Start	Confirm password	Not Required
Technical Support		
Log Off	Set Al	DMIN Password
	114	ser access
	Current 'USER' login password	Security disabled - login password NOT
	requirement	
	Change 'USER' login password requirement to	Required NOT Required
	Login user name is fixed to	USER
	New Password	Not Required
	Confirm password	Not Required
		Horroquiou
	Set U	SER Password
	Connec	ted Host access
	Current host trust setting	Limited
		C None
	Change host trust setting to	C Read-only
	shange nost a ust setting to	C Limited
		C Full
	Set H	ost Trust Setting
	Set H	ost Trust Setting

The information displayed is as follows:

Current 'ADMIN/USER' login password requirement - displays whether security is enabled or not.

Change 'ADMIN/USER' login password requirement to – selects the security mode for either the ADMIN or USER account. Use the radio buttons to select the desired mode.

Login user name is fixed to – Both the USER and ADMIN user names are fixed and cannot be altered.

Password – type a new password in to this text box.

Confirm password – re-enter the new password to confirm password change.

When you have entered the new USER/ADMIN settings press the relevant set button. Only alter one user at a time.

SSL Configuration

Secure Socket Layer (SSL) is a means to encrypt and authenticate sessions between your browser and the target web server. It is commonly used to enable secure credit card transactions with online stores.



The information displayed is as follows:

SSL status - shows the current SSL configuration, any certificate problems and a download link for the current root CA certificate when applicable. To avoid your browser indicating certificate errors when using an HTTPS connection you should download the root CA certificate and add it to your browser's trusted certificate store.

SSL mode - this setting selects what type of browser connection is allowed to the RAID system. "HTTP only" closes network port 443 which disables SSL or HTTPS connections. "HTTPS only" enables SSL and disables HTTP connections, port 80 remains open and any HTTP requests will be automatically redirected to HTTPS. "HTTPS and HTTP" allows either HTTPS or HTTP connections.

Configure Certificate and Key - allows custom configuration of the SSL certificate and key, there are 3 modes available as follows.

- **Dynamic certificate** is the default mode, the SSL key and certificate is automatically generated at startup and signed with the Nexsan default root CA certificate. The common name (CN) is set to the IP address of the RAID controller to prevent browser warnings. When the Nexsan root CA certificate is downloaded and installed in your browser's trusted certificate store you should not see any certificate warnings from your browser when using HTTPS.
- **Dynamic certificate** inherited from uploaded CA root will automatically generate the SSL key and certificate at startup and sign it with the uploaded CA certificate. To switch to this mode you must provide and select files for the CA certificate and SSL key. The files must be in either PEM or DER format. You can create and use your own CA certificate if required, although if you do this you must install your CA certificate as a trusted certificate in your browser to avoid certificate warnings. The common name is set to the IP address of the RAID controller, other certificate fields will be copied or inherited from the uploaded CA certificate. When using dual controllers the uploaded CA certificate is copied and used by both controllers.
- Use uploaded certificate and key will use whatever certificate and key data is uploaded (PEM or DER format only) providing the data is a valid certificate and key. When using dual controllers you must provide files for each controller, this is so the common name (CN) can be correctly configured in the uploaded certificate.

When using your own certificate and key make sure you keep the key in a secure location to avoid your SSL connection being compromised.

GUI Settings

The GUI settings page allows you to make global appearance and operational changes to the GUI.



The information displayed is as follows:

Enable JavaScript GUI enhancements – JavaScript has been used in some of the html pages to improve the operation and look of the GUI. Should this script cause problems for your browser this option can be switched off so only standard html is used. If this page cannot be loaded using the normal login process then it can be reached directly by typing "<IPaddress>/admin/guiprefs.asp" into your browser, once this page is shown the JavaScript enhancements can be switched off and then login re-attempted.

Enable persistent tooltips – When this option is enabled, a tooltip-style popup box showing additional information will appear when the mouse cursor is placed over an icon. This option requires JavaScript to be enabled.

Minimize page scrolling by using submenus where appropriate – Use this option to show a summary submenu which will reduce the need to scroll.

Minimize page scrolling by showing less information – Use this option to reduce the amount of information shown in order to reduce the need to scroll. Only the essential information will be shown with this option set.

Highlight array text using different colours – Using this option will show different colours for different array numbers to aid visual identification of array members.

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Select the units you wish to use for volume size and free space entry – Use this function to change the units (e.g. megabytes or gigabytes) that you enter to create a new volume, reserve free space and expand a volume.

Web page auto refresh (10 to 120 secs) – For the current status information to be displayed, web pages must be re-requested by your browser. This can be done manually by re-clicking the link to the web page or automatically by your browser. Enabling auto refresh will only affect the status pages of this interface. These pages will be requested automatically according to the time interval you configure.

Click the "Save Settings" button to save your configuration.

QuickStart

Basic View

QuickStart is a quick and easy way to set up the storage attributes of the product. If your system has no arrays present, QuickStart is a good way to get started.

From the GUI home page click on "QuickStart" from the left frame. The main page will then display the Basic QuickStart configuration – see below.



QuickStart will automatically create a number of RAID arrays and up to 10 volumes per array, depending storage model and the setting selected. If you are using many high capacity disks, it may be the case that you end up with more LUNs than expected, as the maximum LUN size is 2.2TB by default. If your hosts support LUNs over 2.2TB uncheck "Limit volume size to less than 2TB" checkbox. All volumes are mapped to both fibre host ports.

Select the configuration that is most applicable to you. If none of the options fit what you want to achieve, you should consult the sections "Configure RAID" and "Configure Volumes" in this manual.

Once you have made your selection, press next and the following page will show a confirmation page of your choices:



The QuickStart process will automatically change any settings that are not already configured correctly. There is no need to change anything before starting the process.

If the choices are correct, tick the checkbox and press the "QuickStart" button, which can be seen by scrolling to the bottom of the page:

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File Action View Help							
🗢 🔿 🖄 🖬 🛛 🖬							
							<u>.L OK</u>
Home	Array #3	2249.9 GB	RAID 5	128 Kbytes	Controller 0	22, 24, 26, 28, 29, 31, 35, 37)	•
System Information	Array #4	1999.9 GB	RAID 5	128 Kbytes	Controller 1	9 (Disks 30, 32, 34, 36, 38, 39, 40, 41, 42)	
Configure RAID							
Configure Volumes	Volume	Canacity	Array		L IIN Mar	pping	
Config Host Access	Volume #1	2199 0 CB	Arrav #1	Controller 0	Fibre - Host		
System Admin	Volume #2	50.9 GB	Array #1	Controller 0	, Fibre - Host	t 0, LUN 1	
Configure Network	Volume #3	2199.0 GB	Array #2	Controller 1	, Fibre – Host	1, LUN 0	
Ouick Start	Volume #4	50.9 GB	Array #2	Controller 1	, Fibre – Host	t 1, LUN 1	
	Volume #5	2199.0 GB	Array #3	Controller 0	, Fibre – Host	t 0, LUN 2	
Technical Support	Volume #6	50.9 GB	Array #3	Controller 0	, Fibre – Host	t 0, LUN 3	
Log Off	Volume #7	1999.9 GB	Array #4	Controller 1	, Fibre – Host	t 1, LUN 2	
	Parameter Description Pool Spares 2 pool spares will be added (Disks 25, 23) Hosts will have full access to volumes by default Volume Access Volume Access Volumes will be accessible immediately, but performance will be degraded until array verification is complete Check this checkbox to confirm Image: Check this checkbox to confirm Quickstart Image: Check this checkbox to confirm Review all settings above, and then confirm by clicking the checkbox and clicking the 'Quickstart' button. The RAID system will then be configured according to the information above. Creating new arrays will take several hours.				E		
	Note that all existing arrays and volumes will be deleted.				•		

CAUTION: "QUICKSTART" WILL ERASE ALL USER DATA STORED ON THE PRODUCT; THIS DATA CANNOT BE RECOVERED.

A final warning will appear to ensure that you are aware that any current data will be destroyed.



Again, click the tick box and click "Confirm QuickStart Configure" to continue or click the "CANCEL QuickStart" button to cancel. The QuickStart operation may take several hours to construct the array data. You can check on the progress of this in the progress page. Using the Main Menu on the left side of the page, click on "<u>RAID Information</u>" and click on the "<u>Progress</u>" tab from the top of the main page. See "<u>Progress</u>" in this manual. When the progress bar reaches 100% the array is ready to be used.

Expert View

If you click on the "Expert" tab, more options will appear on the QuickStart page.



Checklist

The settings here are designed to be quick and easy to use. All the buttons will take you to other pages in GUI, which are covered elsewhere in this manual.





Tech Support

Contact Details

This page shows you how to get in touch with Nexsan Technical support in the even that your reseller is unable to resolve any issues you may have with the product. The Support Form is recommended.



Tech Support Form

The Technical Support Form allows you to send a complete diagnostic report of your unit directly to your technical support representative. If you have not yet set up all the details in Configure Network -> E-Alerts (see E-Alerts), then you'll see the following page:



Once you have correctly set up and validated items like an SMTP server address, you will be able to click on the "Click Here" link and you will be able to send a detailed problem report form to the configured recipient, on a form similar to that shown below:

Storage Manager - [Nexsan F	RAID Storage\Favorites\S	ATABeast]				x
File Action View Help						
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nexsan						<u>)</u> K
Home	Contact Tech					Â
RAID Information	Details Support					
System Information	Technical Support					
Configure RAID		Send System Status	To Technical S	upport	0	
Configure Volumes	E-Alert/Tech. Support Emailer Status					
Config Host Access	Email send queue is empty (Ready)					
System Admin	Technical Support Form					
Configure Network	Send tech. support message to *		support@nexsan.com			
Quick Start	Customer email address *					
Technical Support 🕟	Contact Details		Shipping [Details (if different))	
Log Off	Contact Name *		Shipping Name			Ξ
	Company *		Company			
	Telephone *		Telephone			
	Address		Address			
	Brief					
	description of the					
	problem *					
	(2000 chars				-	
	max)	1				
	Check 🗖 to confirm					
	Send Tech. Support Email Clear Form Clear Email Queue					
All queued emails will be deleted / lost.						
						Ŧ
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The information displayed is as follows:

Send technical support message to – input the email address of the desired recipient if you have already been in contact with someone in Tech Support, and the default address is not required.

Customer email details – this field defines the sender's email address. Ensure that you type in your own email address or the email address of the person responsible for the system.

Contact details (name & company) - Enter your name and company in theses fields.

Brief description – type in a description of the problem in this field. Also, include details of your operating system/s and SAN environment. Do not exceed 2000 characters.

To confirm and send the diagnostic report email, click in the tick box and then press the "Send Email to Technical Support" button.

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Additional Technical Information

Host-side Details

- Nexsan firmware supports standard inquiry plus VPD pages 00, 0x80, 0x83, and 0x85. Vendor defined pages 0xc0 and 0xc1 are used for Nexsan internal purposes.
- The following mode pages are supported: 0x00, 0x01, 0x02, 0x03, 0x04, 0x08, 0x0a, 0x18, 0x19, 0x1a, and 0x1c.
- No vendor-unique commands or modes are supported and Nexsan units are compliant to specs reported in the standard inquiry command (SAM-3, FCP-3 (fibre only), iSCSI (iSCSI only), SPC-3, SBC-2, SES).

Host Time-outs

The servers that connect directly to the storage unit, or through a switch, will use some kind of Host Bus Adapter (HBA) to provide Fibre, iSCSI or SAS connectivity. Sometimes the HBA is not a separate card but is part of the motherboard, typically for Ethernet/iSCSI or SAS.

In all cases, it is important to ensure that the host timeout is set correctly to avoid the host incorrectly assuming a failure has occurred while the storage unit is performing a normal operation, such as a Rolling Restart_or a Failover (see

System Mode (Failover Settings)). There may be two (or more) settings that are relevant – Disk Timeout and Link Timeout. In any case, ensure these are at least 60, or sometimes 120 seconds. Check the documentation that came with your HBA. The following links may also be helpful:

Cluster servers may experience connection timeouts to drives after you install or upgrade to the Windows Clustering feature in Windows Server 2003: http://support.microsoft.com/kb/818877

Failover Cluster has unexpected storage resource fail-overs: http://support.microsoft.com/kb/954088

Disk timeout is not set at default:

http://technet.microsoft.com/en-us/library/aa997069(EXCHG.80).aspx

Redundant Array of Independent Disks (RAID)

RAID is an acronym for Redundant Array of Inexpensive Disks. It means that a RAID system should be able to cope with hard disk failures with no impact on connected computers.

The following list is a brief introduction to the various RAID Levels that are available. The ones used with Nexsan storage products are explained in more detail in the main text.

Level 0 – Provides Data Striping (spreading out blocks of each file across multiple disk drives) but no redundancy. This improves performance but does not deliver fault tolerance. If one drive fails then all data in the array is lost.

Level 1 – Mirroring and Duplexing: Provides disk mirroring. Level 1 provides twice the read transaction rate of single disks and the same write transaction rate as single disks.

Level 2 – Error Correcting Coding: Not a typical implementation and rarely used, Level 2 stripes data at the bit level rather than the block level.

Level 3 – Bit Interleaved Parity: Provides byte level striping with a dedicated parity disk. Level 3, which cannot service simultaneous multiple requests, also is rarely used.

Level 4 – Dedicated Parity Drive: A commonly used implementation of RAID, Level 4 provides block level striping (like Level 0) with a parity disk. If a data disk fails, the parity data is used to create a replacement disk. A disadvantage to Level 4 is that the parity disk can create write bottlenecks.

Level 5 – Block Interleaved Distributed Parity: Provides data striping at the byte level and also stripe error correction information. This results in excellent performance and good fault tolerance. Level 5 is one of the most popular implementations of RAID.

Level 6 – Independent Data Disks with Double Parity: Provides block level striping with parity data distributed across all disks.

Fiber Channel Topologies

The storage unit is capable of supporting the two most commonly recognised Fiber Channel topologies, "loop" and "point-to-point".

Loop Topology

The loop topology can be used to directly connect to a HBA (Host Bus Adapter) running in loop mode, but point-to-point is actually more efficient at this. Loop is mostly used when connecting the unit to a hub or loop switch. When using a hub all traffic is passed through all the nodes in the loop until it reaches the destination node. The entire bandwidth of the loop is shared by all the nodes. This significantly reduces performance.



The above diagram shows the two lines from each node going in to the hub in the centre. Each line represents either the TX (transmit) or RX (receive) of each nodes cable. The following diagram shows the route of a packet going from the middle server to the storage unit.



The data travels around the loop until it reaches the destination.


This diagram shows the data being transmitted from the storage unit back to the same server. These diagrams show that loop modes are not particularly efficient.

Point-to-point Topology

The next series of diagrams show the same scenario as the loop mode running with a hub but this time using point-to-point mode with a fabric switch.



In the above diagram it is not necessary to display the TX and RX as each node communicates directly with the switch. The logic in the switch sends data directly from one node to the destination node. The following diagram shows the same communication as before.



Here you can see that the data does not have to travel via other nodes and therefore does not affect the performance of the other nodes.

SAN Integration

One of the main advantages with SAN is the ability to consolidate vast amounts of storage for multiple servers. It is of vital importance that this storage is always available to all hosts. With a SAN it is likely that you will need to use other components such as hubs or switches, which play a key role in the deployment of a High Availability SAN.



The SAN pictured above is typical of a High Availability environment. There are multiple servers connecting to two independent switches (there can be many), which in turn are connected to a storage unit. Each host has two Fiber Channel host bus adapters installed, and each adapter connects to a separate switch. This ensures that data flow can continue in the event of a Host Bus Adaptor (HBA), cable or switch failure as well as disk, PSU or RAID controller failure in the unit.

Setting Up iSCSI in a Windows Environment

Your version of Windows may or may not include an iSCSI initiator, and if not, you download the software from:

http://www.microsoft.com/downloads/details.aspx?FamilyID=12cb3c1a-15d6-4585-b385befd1319f825&DisplyLang=en

or search the Microsoft website.

Once you have a correctly installed initiator, start the initiator and click on "Discovery" then "Add".

Address	Port	Adapter	IP Address
Add		Remove	Refresh
Name			
Add	1	Remove	Refresh

Enter the IP address of the target storage unit Ethernet port, and port number 3260, then click O.K.

dd Target Portal		
Type the IP address or DNS nan want to add. Click Advanced to session to the portal.	ne and socket numbe select specific setting	r of the portal you gs for the discovery
IP address or DNS name:	Port:	
<u></u>		-

Click on the "Targets" tab and highlight the attached unit. Then click "Log On" and "OK".

eneral Discovery	Targets Persistent T	argets Bound Volumes	/Devic
Select a target and cl target. Click details to devices for that targe	ick Log On to access see information abou t.	the storage devices for t the sessions, connection	hat ns and
Targets:			
Name		Status	1
ign.1999-02.com.ne	xsan:p0:sataboy:01ff0	0aa Inactive	
	Details	Log On Refr	esh

A "Log On to Target" box should pop up. Select your preferred settings and then click on O.K.

Log On to Target		×
Target name:		
ign.1999-02.com.nexsan:p0:s	ataboy:01ff00aa	
Automatically restore this co	onnection when the sys	stem boots
🔲 Enable multi-path		
Only select this option if iSe on your computer.	CSI multi-path software	e is already installed
Advanced	ОК	Cancel

The target should now show as being connected. Click on O.K to close the Initiator setup.

Select a target and click Log On to access the sto target. Click details to see information about the se devices for that target.	rage devices for that essions, connections and
Targets: Name Ign.1999-02.com.nexsan:p0:sataboy:01ff00aa	Status Connected

To Verify the Target which was connected in the iSCSI Initiator, click on the RAID INFO menu then the iSCSI info tab – see "iSCSI Information". The Target Name should match that in the Targets column of the iSCSI Initiator.

Scan the Host PC to detect any configured Volume/s. The iSCSI volume can be identified by the larger gap between SATABoy and SCSI Disk, as opposed to a volume configured via a fabric switch, which has no gap between SATABoy and a SCSI Disk Device in the screenshot below.



Troubleshooting

Web Interface Problems

When I type in the IP address I have assigned to my storage unit in my web browser, nothing happens.

Check that the system is responding:

The best way to contact the storage unit is with a ping utility. Different operating systems have different ping utilities, but they are on the whole very similar. We will use Microsoft for the purpose of this guide.

Open a DOS window and retreat to the root level of the C drive (or the drive that has the currently loaded Operating System), to do this type:

 $cd \setminus$

Then attempt to "ping" the Nexsan unit. Type:

C:\> ping 192.1.168.225

NOTE - Replace the above address with your unit's IP address.

If the ping is successful you will see a similar response to the one below.

Reply from 192.168.1.225: bytes=32 time=10ms TTL=30 Reply from 192.168.1.225: bytes=32 time<10ms TTL=30 Reply from 192.168.1.225: bytes=32 time<10ms TTL=30 Reply from 192.168.1.225: bytes=32 time<10ms TTL=30

Ping statistics for 192.168.1.225: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milliseconds: Minimum = 0ms, Maximum = 10ms, Average = 2ms

If you have a successful reply but cannot access the home page please consult Technical Support.

If no reply is returned check that you are using the right IP address. If you are using DHCP, check that the DHCP has allocated an address to the storage unit.

If you still get no reply you should attempt to reset the IP address manually. Use the serial port. Please refer to the main set up guide.

When I am using the menus, why am I being asked to provide a username and password?

You probably have security turned on. The username "ADMIN" and password "PASSWORD" (both uppercase without quote marks) will allow you to access any page.

The default user name and password are not responding, what do I do?

Make sure that you are entering the username and password in UPPERCASE, as this logon is case sensitive. If this is not the case the user name and password may have been changed from the original factory settings.

You can reset the password using the serial port interface.

Use the "Getting Started" section to see how set up your computer to run with the serial port.

When logged on to the serial port, use the cursor keys to navigate the menus.

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From the main menu go to;

System Admin >> Set GUI "Admin" password

Type the new password into the supplied box.

The password is set immediately.

Start Up Problems

When I power up my storage unit it beeps. What is the problem?

The subsystem will beep for a variety of reasons. A beeping unit does not mean that the unit is broken. If you have email enabled check your inbox. This will probably provide a clear explanation of where the problem lies.

You can also find the current problems using either the Web interface by clicking the red X in top right corner of the home page.

Another way to discover problems is by checking the lights on the unit.

The front panel LEDs are clearly marked and will give an indication to where the problem lies.

For further help, contact Technical Support.

When I start up, the battery LED is flashing. Is my battery dead?

No. The flashing LED means that the battery state is unknown or is charging. It is normal for this light to flash for the first 10 minutes of operation because the state of the battery is unknown.

If the flashing persists after ten minutes, the battery is charging. If the LED is solid red after ten minutes the battery has failed and needs replacing.

Controller Replacement

In most situations, when a controller is replaced, the replacement will automatically inherit the same configuration and system settings as the original that it is replacing.

Under some circumstances however, the correct configuration cannot be determined automatically – for example when the controller has previously been used in another system. In this case, a cloning page will be presented both on the serial port and on the web interface (at the replacement controller's default IP address), presenting you with a choice between using a controller configuration stored on the disks or using the configuration stored in the controller's flash memory.

If you are fitting a replacement controller to a functional system, you should select "n" to use the configuration stored on the disks. If you are installing a replacement disk set or chassis, you should select "c" to use the configuration stored in the controller's flash memory. If you are unsure which option is correct for your situation, contact Nexsan Technical Support for more information.

Resolving Other Problems

The Web GUI has told me that a disk has failed. My data is still online. What should I do?

If a disk has failed you will need to find out which one it is. Do this by using the web GUI, you should extract the faulty disk, DO NOT re-use a failed disk in the system even if it appears to have no fault. Then contact your dealer regarding a replacement. Arrange for a replacement as soon as possible, as your array may be in a critical state. When the replacement module arrives you should check that no damage has been caused during transit and then insert into the empty slot. The unit will detect the new disk and rebuild to it if the array is critical. If you already had a spare disk the unit will assign the new disk as a spare too, check this has happened using the web GUI.

A power supply has failed. My system still works, but what should I do?

Do not remove the faulty power supply! Removing a power supply will drastically reduce airflow and cooling, potentially resulting in over heating the system. Contact your dealer regarding a replacement PSU. Only remove the failed PSU when the replacement arrives.

My RAID controller has failed. What should I do?

If a RAID controller fails you will not be able to access your data. Your data will be safe on the disks until a replacement controller arrives^{*}. Leave the controller in place and contact your dealer for a replacement.

CAUTION: DATA STORED IN THE WRITE CACHE WILL BE LOST IF A CONTROLLER FAILS IN NON-AA SYSTEMS.

Please contact your dealer or Technical Support for help with any other queries.

Contact Information

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