# RocketStor 6422TS User Manual

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#### FCC Part 15 Class B Radio Frequency Interference statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### European Union Compliance Statement

This Information Technologies Equipment has been tested and found to comply with the following European directives:

- European Standard EN55022 (1998) Class B
- European Standard EN55024 (1998)

# **Table of Contents**

Product Overview	6
Kit Contents	6
Section 1: Hardware Installation	
Preparing the Enclosure	8
Preparing the HBA (Host Bus Adapter)	8
Connecting the HBA with the Enclosure	9
LED Activity	
Section 2: Drivers	
Installing Drivers on an Existing Operating System	13
Checking your Driver Version	
Loading Drivers onto a Bootable Array	
Updating the Drivers	
Uninstalling the Drivers	21
Section 3: Navigating RocketRAID 2722 BIOS Utility (PC only)	22
Table 1. Summary of BIOS options	23
Create	23
Delete	24
Add/Remove Spare	25
Settings	25
View	
Initialize	
Section 4: BIOS/Firmware	27
Using the WebGUI to update BIOS/Firmware	
Using a Bootable USB to update BIOS/Firmware	
Section 5: Navigating the HighPoint WebGUI	
Installing HighPoint WebGUI	
How to Login HighPoint WebGUI	
Global Tab	
Viewing HBA Properties	
Viewing Storage Properties	

Physical Tab	
Updating BIOS/Firmware	
Obtaining Physical Device Information	
Logical Tab	
Creating an Array	41
Adding Spare Disks	
Obtaining Logical Device Information	45
Normal Status	
Critical Status	47
Disabled Status	47
Expanding an Existing Array	
Setting Tab	51
System Settings	
Password Setting	53
Changing your WebGUI password	53
Recovering your WebGUI password	53
Email Setting	53
Recover Tab	55
How to Backup your Recover List	56
How to Reload your Backup Recover List	56
Event Tab	56
Table 3. Event Log Icon Guide	57
SHI (Storage Health Inspector)	57
How to Enable SMART Monitoring	58
How to Change HDD Temperature Threshold	59
How to Use the Health Inspector Scheduler	59
How to Create a New Verify Task	60
Section 6: Formatting the RAID Volumes	60
Section 7: Troubleshooting	65
Handling Critical Arrays	65
Rebuilding Stops Due to Bad Sectors	66
Critical array becomes disabled when you removed faulty disk	66

66
67
68
69
71
72
72

## **Product Overview**

The RocketStor 6422TS bundle package includes a enclosure for housing your physical drives and a RAID Controller to manage and create RAID arrays of different levels.

- NetStor 2U 8-bay SAS/SATA JBOD Enclosure
- HighPoint RocketRAID 2722 Controller

# Kit Contents

Before getting started, check to see if any items are missing, damaged, or incorrect. For any discrepancy contact your reseller or go to <u>www.highpoint-tech.com</u> for online support.

Item	Count
NetStor NA341A-R Enclosure	1
HighPoint RocketRAID 2722	1
HDD Trays	8
mini-SAS (SFF-8088) Cable	2
Power Cord	1
Manual CD-ROM	1
HDD mounting screws	32
HDD lock keys	2

Feature	DeclertStor (422TS		
Specifications	KOCKEtStor 642215		
Host Port	2x Mini-SAS		
RAID Controller	RocketRAID 2722 / PCIe 2 0 x8		
/Bus Interface			
RAID Level	0, 1, 5, 6, 10, 50, JBOD		
Max. Capacity	Up to 64 TB		
Number Of drives	Up to 8		

Drive Interface	SAS, SATA
Drive Form Factor	3.5"
Chassis Material	Heavy-duty cold-rolled steel housing
Dimension	18" (D) ×19" (W) × 3.5" (H)
Weight	36.85 lbs.
UPC	643653642229
Warranty	2 Years
	Flash ROM for Upgradeable Firmware
	Storage Health Inspector
	Redundant RAID Configurations
	BIOS PnP (plug and play) and BBS (BIOS boot specification) support
	(Note: does not apply to Mac OS X)
	Bootable RAID Array
	Multiple RAID Partitions supported
	Multiple RAID Adapters supported
	Online Array Roaming
Advanced RAID	Online RAID Level Migration (ORLM)
Features	Online Capacity Expansion (OCE)
	RAID Initialization Background/Foreground/Quick
	Global Hot Spare Disk support
	Automatic and configurable RAID Rebuilding Priority
	Disk Format compatible: 512, 512e, 4Kn
	Larger than 2 TB Drive and RAID Array support
	Spin down Massive Arrays of Idle Disks support
	Native Command Queuing
	Stagger Drive Spin Up
	Write Back and Write Through
Storage Monitor	ring and Management Suite
<b>U</b>	RAID Management Suites, BIOS/Firmware configuration tool,
RAID Management	Browser-Based management tool,
Suites:	CLI(Command Line Interface) - scriptable configuration tool, API
	package
SMTP	Email Alert notification
Cooling Fan:	Two 60×60×25 mm
Power Supply	Redundant 400 W 100-240 V AC, 50/60 Hz universal
LED Display for Each	White - Power-On Indicator / Blue -Busy (HDD Access) Indicator
Tray	white - I ower-on indicator / Dide -Dasy (IIDD / Recess) indicator
LED Display For	POWER on LED (white) / FAN (Normal – green; Fail – red) / TEMP
Enclosure	(Normal – green; over 55°C – red)
<b>Operating Syste</b>	m Support
Window	Windows / Windows Server
Linux:	RedHat Enterprise, Open SuSE, Fedora Core, Debian, Ubuntu
FreeBSD	9.3 and Later
Mac OS X	OS X 10.6 and later
Driver embedded	OS X 10.10 (apply for RocketStor 6422TS)

Operating Environment			
Temperature	emperature (Operating) 5°C – 45°C / (Non-operating) -40°C – 65°C		
Relative Humidity	(operating) 8% – 90% RH (Non-condensing) / (Non-operating) 5% – 95% RH (Non-condensing)		
Certification	CE, FCC, RoHS		

# Section 1: Hardware Installation

This section covers the following topics:

- 1. Setting up the Enclosure
- 2. Setting up the HBA (Host Bus Adapter)
- 3. LED Activity

#### Preparing the Enclosure

You can refer to the NetStor 2U 8-Bay Rackmount Quick Installation Guide for details on how to set up the enclosure.

1. Take out the HDD tray and place your hard drive in the tray as shown below. Then install the tray back into the enclosure. Repeat for all your hard drives.



- 2. (Optional) Lock your HDD tray with the included disk tray key.
- 3. Place the enclosure on a server rack or another stable, flat surface.
- 4. Connect the enclosure to a power source with the AC Power Cord.
- 5. Connect the enclosure to the included RocketRAID HBA using the mini-SAS to mini-SAS cable (SFF-8088).

## Preparing the HBA (Host Bus Adapter)

The following instructions describe how to prepare your RocketRAID 2722 HBA for use.

To install your RocketRAID 2722:

**Important**: Before installing the RocketRAID 2722 Controller, ensure that your system is powered **OFF**.

- 1. Locate a PCIe 2.0 x8 slot (or compatible slot) on your PC motherboard.
  - Note 1: Refer to your PC manual for instructions on how to access your motherboard.
  - Note 2: Refer to your motherboard manual for instructions on how to locate your PCI Express slot.
- 2. Align the RocketRAID 2722 with the PCIe slot and push straight down until card is fully seated.
- 3. Tighten the connection by fastening the RocketRAID bracket and enclosure together.

A PCI-Express 2.0 x8 card is compatible with PCI-Express 2.0 x16 and PCI-Express 3.0 x16 slots.



## Connecting the HBA with the Enclosure

Use the mini-SAS (SFF-8088) cables provided to connect the enclosure ports to the RocketRAID ports.



Figure 1. Enclosure Front Panel





Ke	Key				
1	HDD Power LED	5	Temperature LED GREEN- normal temperatures RED – over 55° <i>C</i>		
2	HDD Status LED	6	Power Cord Receptacle		
3	Mute Button : Resets alarm	7	dual mini-SAS (SFF-8088) Connectors		

4	FAN Status LED: GREEN – normal	8	DB9 Connector (Connecting SGPIO signal for HDD fail display) (Not Applicable for RocketRAID 2722)
	status RED – FAIL status		

## LED Activity

The following information tells you how to interpret LED activity seen on the enclosure and disk trays.

	Present	Active	Failed	Identify
Disk Tray	WHITE	BLUE	N/A	N/A
Enclosure LEDs	WHITE		N/A	N/A
Fans LEDs		GREEN	RED	N/A
Temperature LEDs		GREEN	RED	N/A

**Present** - Indicates that the disk is present and available.

Active - Indicates the disk is performing disk I/O

Failed – Indicates disk failure (Not available for RS6422TS enclosure)

**Identify** – Identify LED is a setting that can be enabled in Physical > devices. This setting will bring up a RED LED for the drive that is enabled for easy identification. **Identify LEDs are not available on the RS6422TS enclosure.** 



RocketRAID 2722 Key			
PORT2	mini-SAS (SFF-8088) Connection Corresponds to channel 1-4		
PORT3	mini-SAS (SFF-8088) Connection Corresponds to channel 5-8		
BEEP1	Alarm/Beeper		

## Section 2: Drivers

This section covers the following topics:

- Installing drivers on your Operating System
- Verifying driver installation
- Loading drivers on a bootable array
- Updating drivers
- Uninstalling drivers

## Installing Drivers on an Existing Operating System

Drivers provide a way for your operating system to communicate with your new hardware. Updating to the latest drivers ensures your product has the latest performance, stability, and compatibility improvements. Drivers are updated regularly at <u>www.highpoint-tech.com</u>

#### For Windows Users:

- 1. Obtain latest driver software for RocketRAID 2722 Controller from our website www.highpoint-tech.com
- 2. Take note the location you downloaded the driver file to, then open Windows **Device Manager**.
  - Click **Start**
  - Click Control Panel
  - Click Hardware and Sound
  - Under **Devices and Printer**, Click **Device Manager**
  - *Note*: Alternatively, you can search **Device Manager** in your start menu search bar.



3. Under Other Devices, right click on RAID controller



- 4. On the drop down menu, click **Update Driver Software**...
- 5. When prompted, select Browse my computer for driver software

		x
📀 🧕 Update Driver Softw	vare - RAID Controller	
		1
Browse for driver sof	Browse For Folder	
	Select the folder that contains drivers for your hardware.	
Search for driver software in		
C:\Users\Administrator\Do	🗅 🚢 Local Disk (C:) 📃 🔿	
✓ Include subfolders	▷ 🧊 Libraries	
	▷ 🗣 Network	
	A B RR64xL_Windows_Miniport_v1.3.14.0_14_06_	
	<u>⊯</u> x32 ≡	
	<u>₩ x64</u> ~	
Let me pick from		
This list will show inst software in the same	Folder: x64	
	OK Cancel	
	Next	Cancel

- 6. Locate the driver files you downloaded and select them.
- 7. Press **next** and follow the on screen instructions
- 8. Reboot

For Mac Users:

HighPoint Mac Drivers have file extension **.dmg**; make sure the file extension for the files you downloaded are the same.

- 1. Obtain latest driver online at <u>www.hptmac.com</u>
  - Navigate to your specific HBA controller page (Refer to **How to View HBA Properties** to find model name)

Global View	Physical Logical Setting	
HBA Properties		
Host Adapter r	nodel: RocketRAID 2722 SAS Controller	

 Once downloaded, locate the folder you downloaded the driver to and double click on the file named "HighPointRR\_###.dmg" *Note:* File name varies, but extension is .dmg.



3. The file will be mounted onto the operating system, click on **HighPointRR.pkg** located on the mounted drive.

• • •		HighPointRR	
		<b>☆</b> · △	Q Search
Back	View Arrange	Action Share Edit Tags	Search
Favorites		-	The second secon
All My Files			TXT
C iCloud Drive	HighPointRR.pkg	Install_MacOSX_HighPoint	readme.txt
Applications		RR.pdf	
E Desktop			
Documents			
Downloads			
Movies			
J Music			
i Pictures			

#### 4. Follow the on-screen instructions.

	😓 Install HighPointRR RAID Controller	
	Welcome to the HighPointRR RAID Controller Installer	
<ul> <li>Introduction</li> <li>Destination Select</li> <li>Installation Type</li> <li>Installation</li> <li>Summary</li> </ul>	You will be guided through the steps necessary to install this software.	
	Go Back Continue	

#### 5. **Reboot** computer



#### 6. Make sure **Driver Installed** is **Yes**

			Mac Pro			
▼Hardware	Card			^ Туре	Driver Installed	Slot
ATA	NVIDIA GeForce GT 120			Display Controller	Yes	Slot-1
Audio	RocketRAID 2722 SAS C	ontroller		RAID Controller	Yes	Slot-3
Bluetooth						
Camera						
Card Reader						
Diagnostics						
Disc Burning						
Ethernet Cards						
Fibre Channel						
FireWire						
Graphics/Displays						
Hardware RAID						
Memory						
PCI						
Parallel SCSI						
Power						
Printers	RocketRAID 2722 SAS	Controller:				
SAS						
SATA/SATA Express	Name:	RocketRAID 2722 SAS Controller				
SPI	Type: Driver Installed:	HAID Controller				
Storage	MSI:	Yes				
Thunderbolt	Bus:	PCI				
USB	Slot:	Slot-3				
Network	Vendor ID:	0x1103				
Firewall	Subsystem Vendor ID:	0x1103				
Locations	Subsystem ID:	0x0000				
Volumes	Revision ID:	0x0003				
WWAN	Link Width:	x4				
Wi-Fi	Link Speed:	5.0 G1/S				

Figure 3. Click Apple Icon > About this Mac... > System Report > PCI

For Linux and FreeBSD users:

Refer to the **Driver Installation Guide** and **README** files in each driver package for steps to install.

The latest drivers can be found at <u>www.highpoint-tech.com</u>

#### **Checking your Driver Version**

To check if the driver was installed successfully follow the instructions below. The same procedure can be used to determine your driver version.

For Windows Users:

- 1. Click Start
- 2. Click Control Panel
- 3. Click Hardware and Sound
- 4. Under **Devices and Printer**, Click **Device Manager** *Note*: Alternatively, you can search Device Manager in your start menu search bar.
- 5. Click the **Storage controllers** tab
  - If driver is installed it will show RocketRAID 2722 Controller,
  - If driver is *not* installed it will be located in **Other devices** as **RAID Controller**
  - Click **Properties**, then click the **Driver** Tab to find out the version installed.

For Mac Users:

- 1. Click on the Apple Icon (**¢**)
- 2. Click About this Mac
- 3. Click More Info
- 4. Click **System Report**

Overview Displays	Storage Memory Support Service
X	OS X Yosemite Version 10.10 Mac Pro (Early 2009) Processor 2.66 GHz Quad-Core Intel Xeon Memory 3 GB 1066 MHz DDR3 ECC Startup Disk 10.10 Graphics NVIDIA GeForce GT 120 512 MB Serial Number YM9360V24PC System Report Software Update
™ and © 1983-2014 Appl	le Inc. All Rights Reserved. License Agreement

#### 5. Select PCI Cards

			Mac Pro				
▼Hardware	Card				^ Type	Driver Installed	Slot
ATA	NVIDIA GeForce GT 120				Display Controller	Yes	Slot-1
Audio	RocketRAID 2722 SAS C	Controller			RAID Controller	Yes	Slot-3
Bluetooth							
Camera							
Card Reader							
Diagnostics							
Disc Burning							
Ethernet Cards							
Fibre Channel							
FireWire							
Graphics/Displays							
Hardware RAID							
Memory							
PCI							
Parallel SCSI							
Power							
Printers	RocketRAID 2722 SAS	Controller:		0			
SAS							
SATA/SATA Express	Name:	RocketRAID 2722 SAS Controller					
SPI	Type:	RAID Controller					
Storage	MSI:	Yes					
Thunderbolt	Bus:	PCI					
USB	Slot:	Slot-3					
▼Network	Vendor ID:	0x1103					
Firewall	Subsystem Vendor ID:	0x2722 0x1103					
Locations	Subsystem ID:	0x0000					
Volumes	Revision ID:	0x0003					
WWAN	Link Width:	x4					
Wi-Fi	Link Speed:	5.0 G1/S					

Figure 4. Navigate to Apple Icon > About this Mac > System Report > PCI

#### Loading Drivers onto a Bootable Array

Creating an array and then installing Windows OS onto the RAID configuration is a bootable array. Since you cannot use the conventional method of installing drivers, the drive must be loaded during Windows installation.

#### For Windows Users:

1. On first boot-up, press **CTRL** + **H** during the HighPoint RocketRAID splash screen to enter the BIOS RAID creation utility.

- 2. Create the array you want to install your Windows Operating System onto
- 3. With the array created, download the RS6422TS drivers from <u>www.highpoint-tech.com</u> and load them onto a **USB**. You will need to locate the files when prompted to load drivers during Windows Installation
- 4. Start Windows Installation.
- 5. When prompted **Where do you want to install Windows**? Click **Load Driver**
- 6. When prompted, click **Browse**
- 7. Browse to your connected USB and driver files you downloaded
- 8. Click **OK**, and once loaded, you will see a list of drivers detected.
- 9. Select the HighPoint driver file
- 10. Click **Next**, and you should see the RAID arrays you created
- 11. Select the RAID array and click next
- 12. Follow the Windows installation instructions to complete your installation

A bootable array differs for Mac users since there is no way to load the HBA drivers during installation. The only way to create a bootable array would be to use 3<sup>rd</sup> party software, and clone the bootable drive.

For Mac Users:

- 1. You must have an existing installation of the Mac operating system installed.
- 2. Set up the RS6422TS normally by
  - Setting up the hardware ()
  - Installing HighPoint RocketRAID 2722 driver and WebGUI
  - Creating an Array using the WebGUI
- 3. Once an array is created, the logical volume can be seen by your operating system
- 4. Use a 3<sup>rd</sup> party disk cloning tool to copy your bootable drive onto the logical drive you just created.

## Updating the Drivers

#### For Windows Users:

- 1. Obtain the latest driver files for **RocketRAID 2722** from <u>www.highpoint-tech.com</u>
- 2. Open Windows **Device Manager** 
  - Click **Start**
  - Click Control Panel
  - Click Hardware and Sound
  - Under Devices and Printer, Click Device Manager
  - *Note*: Alternatively, you can search Device Manager in your start menu search bar.



- 3. Click the **Storage controllers** tab
- 4. Right click RocketRAID 2722 Controller

<ul> <li>Storage controllers</li> <li>Microsoft Storage Spaces Controller</li> <li>RocketRAID 4520 SAS Controller</li> </ul>	oller
<ul> <li>System devices</li> <li>Universal Serial Bus controllers</li> </ul>	Update Driver Software Disable Uninstall
	Scan for hardware changes
	Properties

- 5. Click Update Driver Software...
- 6. Click Browse my computer for driver software
- 7. Select the driver files you downloaded
- 8. Click next
- 9. Reboot

#### **Uninstalling the Drivers**

Refer to the **Installation Guide** or **README** included in the driver files for the most up to date and accurate way of removing drivers.

For **Windows** Users:

- 1. Open Windows **Device Manager** 
  - Click **Start**
  - Click Control Panel
  - Click Hardware and Sound
  - Under Devices and Printer, Click Device Manager
  - *Note*: Alternatively, you can search Device Manager in your start menu search bar.

- 2. Click the **Storage controllers** tab
- 3. Right click RocketRAID 2722 Controller
- 4. Click Uninstall
- 5. Check the **Delete the driver software for this device** checkbox when prompted
- 6. Click OK
- 7. Reboot

For Mac users:

Refer to the Installation Guide included in the driver files for a more up-to-date procedure.

To uninstall the driver, remove the files copied to your system.

OSX 10.6, 10.7, 10.8	/System/Library/Extensions/HighPointRR.kext
OSX 10.9, 10.10	/Library/Extensions/HighPointRR.kext

Remove/Delete the HighPointRR.kext to uninstall the driver.

# Section 3: Navigating RocketRAID 2722 BIOS Utility (PC only)

The RocketRAID BIOS is capable of viewing and creating RAID arrays. You can enter the BIOS by pressing **CTRL+H** during boot up.

To enter the RocketRAID BIOS:

- 1. Boot up your PC
- 2. When RocketRAID splash screen appears, press **CTRL** + **H**
- 3. You will enter the RocketRAID BIOS Setting Utility

Use the following keys to navigate the BIOS utility		
Keyboard Arrow Keys Navigate the menu		
Enter	Makes a selection	
ESC	Exit current menu / exit BIOS utility	

	Function	Options
Create	Configure RAID arrays	<ul> <li>RAID 0 : Striping</li> <li>RAID 1: Mirroring</li> <li>RAID 1/0: Striping over Mirroring</li> <li>RAID 5: Striping with Rotating Parity</li> <li>RAID 5/0: Striping over RAID 5</li> <li>RAID 6: Double parity</li> <li>JBOD (Volume)</li> <li>Refer to RAID level reference chart for more information on individual RAID levels.</li> </ul>
Delete	Delete RAID arrays	• Your created RAID arrays
Add/Remove Spare	Add or remove spare drives	• Your Physical Drives.
Settings	Adjust boot settings	<ul><li>Select Boot Device</li><li>Staggered spin up</li></ul>
View	View your physical drives or RAID arrays	<ul><li>Devices</li><li>RAID array</li></ul>
Initialize	Initializes your drives	• Your Physical Drives

## Table 1. Summary of BIOS options

#### <u>Create</u>

Select this option to begin creating your RAID arrays.

- 1. Navigate to **Create** using your keyboard arrow keys
- 2. Press **Enter** to open the drop down

3. Select desired RAID level and press enter

Array Name	Press enter and input a desired array name
Select Devices	A list of detected physical drives will appear Press enter for each drive you want in the array Press ESC when finished
Capacity	Input the amount of disk space you want array to take (GB)
Cache Policy	Select Write Through or Write Back
Sector Size	Select desired logical sector size, [512B, 1K, 2K, 4K] <b>Current operating systems render this option redundant and not necessary.</b>
Create	Creates the array using the settings provided

## Table 2. Options under Create

#### <u>Delete</u>

When RAID arrays are created, the HighPoint controller will store "RAID markers" on the first few sectors of your hard drives. Deleting the RAID array will delete the RAID markers, and the rest of the data will remain intact.

- 1. Navigate to **Delete** using arrow keys
- 2. Press Enter
- 3. Select desired RAID array
- 4. Press Enter to delete

5. Confirm deletion by pressing **Y** or cancel deletion by pressing **N**.

## Add/Remove Spare

Physical disks that are added as spares are known as spare drives. Spare drives will automatically replace a failed drive and initiate the rebuilding process.

To configure a spare drive in BIOS:

- 1. Navigate to add/remove spare using arrow keys
- 2. Navigate to the drive you want added as a spare
- 3. Press **Enter Note**: Drives configured in a RAID array already cannot also be a spare drive
- 4. Pressing **Enter** on a drive with the status **configured** (**spare**), which means it was previously set as a spare, will remove the drive from the spare pool.

## <u>Settings</u>

#### Select Boot Device

If you are booting from your RAID array, you can set a boot marker onto the array using this option. The motherboard BIOS will set the RocketRAID card as a boot priority when this option is checked.

- 1. Navigate to settings using arrow keys
- 2. press Enter
- 3. press Enter again
- 4. Select the desired RAID array
- 5. You will return to the main screen once flag is set.

#### Staggered Spin Up (Default: Disabled)

Staggered Spin up is implemented for users that need to power up multiple Harddrives. Powering on all hard drives simultaneously draws a large electrical load; staggered spin up will power on each hard drive one at a time resulting in a stable, lower current draw.

Enabling this setting will instruct the card to power up the hard disks sequentially (one disk approximately every 2 seconds). Some disks do not support this feature, and it is not recommended to enable this option if that is the case.

#### <u>View</u>

The following two options, devices and RAID array, offers certain information related to either the physical drive or logical drive.

Devices	<ul> <li>Channel: location of physical drive</li> <li>Model Number: name of physical drive</li> <li>Capacity: total capacity of physical drive</li> <li>Mode: Physical drive controller mode</li> <li>Status:</li> </ul>
RAID Array	<ul> <li>Array name: Name of your array</li> <li>RAID Level: Level of your array</li> <li>Capacity: Total capacity of array</li> <li>Status: Normal, critical, or disabled</li> <li>OCE/ORLM: Expansion/migration status</li> </ul>

## <u>Initialize</u>

- 1. To initialize your disks:
- 2. Navigate to initialize using your arrow keys
- 3. Press Enter
- 4. Select the disk you wish to initialize and press **Enter** again for each disk

		RocketRAID	2744 B	IOS Setting	Utility v1	.0	
<create></create>	<delete></delete>	<add remove<="" td=""><td>Spare&gt;</td><td><settings></settings></td><td><view> <in< td=""><td>itialize&gt;</td><td></td></in<></view></td></add>	Spare>	<settings></settings>	<view> <in< td=""><td>itialize&gt;</td><td></td></in<></view>	itialize>	
<b>METERS</b>							
Char	mal	Model Number	, c	amacitu(GB)	Mode	Status	
			ACOOF		SATABO	New	
(1) 1-			NEDOR	5000.00	00000	Neu	
(2) 1-2	2: TU	SHIBA MG04A	ASUNE	5000.98	2414200	new	
1-3	3: <b>T</b> O	SHIBA MG04A	CASOOE	5000.98	SATA300	New	
1-	4: TO	SHIBA MG04A	CASOOE	5000.98	SATA300	New	
lananananananan	os os os os os os os de de de						
	Fig	zure 5. The firs	t two disk	(1), (2) are se	et to be initial	ized.	

- 5. Press **Esc** to prompt initialize
- 6. Press **Y** to allow initialize or **N** to cancel.
- 7. Disk status will change to **Initialized**.

## Section 4: BIOS/Firmware

How to Update RocketRAID BIOS/Firmware

There are two ways to update your RocketRAID BIOS/Firmware

- 1. Using HighPoint WebGUI Update Firmware
- 2. Using a bootable USB

A few reasons as to why update BIOS/Firmware

BIOS resource issue	Inefficient BIOS code may cause your boot-up to hang during POST.
Compatibility fixes	Updating firmware may fix issues that occur when using later hardware
Bug fixes	Bugs that are discovered post release are

**Note**: It is recommended to update the BIOS through HighPoint WebGUI. (See Installing HighPoint WebGUI)

Having the latest BIOS ensures you have the latest firmware stability and performance improvements. Updating the BIOS may fix boot up or system resource issues; be sure to read the README before making any changes.

#### Using the WebGUI to update BIOS/Firmware

- 1. Locate the latest firmware on our webpage at <u>www.highpoint-tech.com</u>
- 2. Example firmware file will be in a zipped package with a naming convention such as RR2722\_v###\_xxxx.zip (name of file subject to change)
- 3. Extract the contents of the file
- Read the readme (if included) to make sure you have the correct firmware for your HBA *Note*: Your HBA name and properties can be found in the WebGUI > Physical Tab.
- 5. Locate the proper BIOS file (eg. 2722bios.blf, refer to the README for accuracy)
- 6. Log in to WebGUI (Default user: RAID pass: hpt)
- 7. Select your controller in the drop down menu on the top left.
- 8. Click the Physical tab and update firmware will be on the bottom of the page.
- 9. Click **Choose File** and browse to the BIOS file
- 10. Click Submit
- 11. Reboot

#### Using a Bootable USB to update BIOS/Firmware

Create a bootable USB using a utility such as Rufus. **Caution**: Creating a bootable USB will erase all previous data stored on it.

- 1. Download the latest BIOS/Firmware file found at <u>www.highpoint-tech.com</u>
- 2. Extract the file contents onto the bootable USB
- 3. Read the README for instructions on how to flash the BIOS onto your hardware.
- 4. Reboot your computer into DOS mode by:
  - Setting boot priority to the bootable USB
  - Removing all bootable drives (OS, CD Drives) from motherboard and leaving only the bootable USB and RocketRAID card plugged in
- 5. Once in DOS mode, you should see a command line interface

```
Copyright (C) 1997-2013, Intel Corporation
PXE-E61: Media test failure, check cable
PXE-M0F: Exiting Intel Boot Agent.
Intel(R) Boot Agent GE v1.5.04
Copyright (C) 1997-2013, Intel Corporation
PXE-E61: Media test failure, check cable
PXE-MOF: Exiting Intel Boot Agent.
FreeDOS kernel 2041 (build 2041 OEM:0xfd) [compiled Feb 7 2012]
Kernel compatibility 7.10 - WATCOMC - 80386 CPU required - FAT32 support
(C) Copyright 1995-2012 Pasquale J. Villani and The FreeDOS Project.
All Rights Reserved. This is free software and comes with ABSOLUTELY NO
WARRANTY; you can redistribute it and/or modify it under the terms of the
GNU General Public License as published by the Free Software Foundation;
either version 2, or (at your option) any later version.
C: HD1, Pri[ 1], CHS=
                        0-1-1, start=
                                           0 MB, size= 7788 MB
FreeCom version 0.84-pre2 XMS_Swap [Aug 28 2006 00:29:00]
Using US-English keyboard with US-English codepage [437]
C:\>_
```

Figure 6. Bootable USB formatted with Rufus Utility, FreeDOS CLI (Command Line Interface)

- 6. Type in the command you found in the README (ex. load.exe <filename>
- 7. For RocketRAID 2722, the command is load.exe rr2722.112 (for BIOS v1.12)

```
Volume in drive C is FREEDOS
Volume Serial Number is C426-AF92
Directory of C:\BORK
                    <DIR> 04-20-15 9:41a
                    (DIR) 04-20-15 9:41a
RR644L~1 ZIP
                  105,572 05-29-15 10:54a
README
        TXT
                    2,252 03-06-13 4:01a
DAD
        EXE
                  119,186 01-16-13 7:40p
RR644LS V11
                   72,903 03-06-13 3:39a
644LSL~1 100
                    4,096 01-16-13 7:49p
        5 file(s)
                         304,009 butes
        2 dir(s)
                      6,683 Mega bytes free
C:\BORK>load.exe RR644LS.V11
Load Utility for Flash EPROM v12.9.3
(built at Jan 17 2013 10:40:15)
Set flash size to 72K
Found adapter 1 at bus 1, device 0
Flash size 0x12000, File size 0x11cc7
Offset address 0x20000
EPROM Vendor: WINBOND W25X40BV
Do you want to backup BIOS(Y/N): _
```

Figure 7. Navigate to folder you extracted files to, then type command found in README. In this case, load.exe RR644LS.V11

#### 8. Reboot

## Section 5: Navigating the HighPoint WebGUI

The HighPoint WebGUI management utility allows you to do several key things:

- Create and remove arrays
- Monitor disk health
- Update firmware and BIOS
- Change enclosure settings
- Troubleshoot faulty drives
- View general system overview

Tab Name

Function

Global View	View HBA (Host Bus Adapter) and Storage Properties
Physical	View Additional Controller properties Update BIOS/Firmware View disk properties Adjust selected disk behaviors
Logical	Manage and create RAID arrays
Setting	Adjust WebGUI controls settings
Event	Show WebGUI Event Log
SHI (Storage Health Inspector)	View and schedule S.M.A.R.T monitoring
Recover	Revert to previously created arrays
Logout	Logout of WebGUI
Help	Additional WebGUI documentation Online Web Support

## Installing HighPoint WebGUI

The HighPoint WebGUI is the primary link between you and your RAID array. Using the management utilities and menus offered by the WebGUI, you will be able to access, create, and maintain your RAID arrays.

New features are continually added to the interface; update to the latest version at <u>www.highpoint-tech.com</u>.

1. Locate the HighPoint WebGUI Setup on our website <u>www.highpoint-tech.com</u> and download the WebGUI package. Extract the contents and double click on **HighPoint RAID Management.exe** 

🐌 l ⊋ 🚯 = l	RAID_Manage_Win_	v2.5.2.4_15_01_12		_ 🗆 X
File Home Share	View			~ <b>(</b> )
🔄 🗇 🔹 🕇 퉬 🕨 RA	AID_Manage_Win_v2.5.2.4_15_01_12	~ ¢	Search RAID_M	anage_Win_v2 🔎
🔆 Favorites	Name	Date modified	Туре	Size
📃 Desktop	🕌 HighPoint RAID Management	11/12/2014 1:25 PM	Application	1,667 KB
🗼 Downloads	HPT_CLI_Guide.pdf	1/12/2015 3:33 PM	PDF File	421 KB
🕮 Recent places	README	1/12/2015 3:39 PM	Text Document	6 KB
I툎 This PC 🗣 Network				

Follow the on screen steps to install our software.



2. Log in the WebGUI by double clicking the desktop icon created or by typing <u>http://localhost:7402</u> in your preferred browsers address line (it is recommended to use the latest version of your browser.)



## How to Login HighPoint WebGUI

You can reach the HighPoint WebGUI log in page either by:

- Double clicking on the HighPoint RAID Management icon created on your desktop
- Opening your preferred web browser and typing <u>http://localhost:7402</u> in the address bar.

The default username and password to login is

## Username: RAID Password: hpt

Username and Password are Case-Sensitive (Username is not changeable)

## Remote Login

A user connected to a local network can remotely access the WebGUI using the IP address of the host device.

To obtain your IP address For **Mac** Users:

- 1. Open a **terminal** window on the host computer (computer that is connected to the RS6422TS enclosure)
- 2. Type ifconfig
- 3. Look for the connection that has **status: active**
- 4. Write the IP address located after **inet**:



Figure 8. Example: en2 has active status, the IP is 192.168.1.254

For Windows Users:

- 1. Open a command prompt window on the host computer.
- 2. Type ipconfig
- 3. Look for the section that contains your network adapter information
- 4. Take *Note* the IP address

Administrator: Command Prompt
Windows IP Configuration
Ethernet adapter Ethernet 5:
Media State Media disconnected Connection—specific DNS Suffix . :
Ethernet adapter Ethernet 4:
Connection-specific DNS Suffix .: Link-local IPv6 Address: fe80::c825:4b78:9cc1:2387%17 IPv4 Address: 192.168.1.143 Subnet Mask: 255.255.255.0 Default Gateway: 192.168.1.1
Ethernet adapter Ethernet 3:
Media State Media disconnected Connection-specific DNS Suffix . :
Ethernet adapter Ethernet 2:
Media State Media disconnected Connection-specific DNS Suffix . :

Figure 9. Example: The IPv4 address is under Ethernet adapter Ethernet 4 and is 192.168.1.143

**Note:** Make sure **Restrict to localhost access** is **disabled** in WebGUI **Setting** (Refer to setting)

You can then remotely access the WebGUI using any other computer that is in your local network by opening any web browser and typing http://{IP address of host computer}:7402 (default port is 7402)

## <u>Global Tab</u>

ilobal View	Physical Logical Setting	Event SHI Recover Logout Help
A Properties		Storage Properties
Host Adapter mode	el: RocketRAID 4520 SAS Controller	Total Capacity: 17002 GB
Enclosure count:	0	Configured Capacity: 17002 GB Free Capacity: 0 GB
Physical Drive:	4	
Legacy Disk:	0	
RAID Count:	1	Configured 100.0%

The GUI Global view provides an overview of what each HighPoint controller card connected to your computer detects. It is also the first page you see when logging in.

- Host Bus Adapter Properties
- Storage Properties

On the top left of the page is a drop down menu that allows you to select which controller you want to manage (if you have multiple HighPoint controllers connected).

## Viewing HBA Properties

- 1. Log in to WebGUI
- 2. Select the proper controller from drop down on the top left

3. Click Global View

#### **HBA** Properties

- Host Adapter model: the model name of the controller
- Enclosure Count: number of external enclosures detected
- Physical drives: number of drives seen by the controller
- **Legacy Disks**: number of Legacy disks connected. Legacy disks are physical drives that have previous partitions stored on them.

## Viewing Storage Properties

- 1. Log in to WebGUI
- 2. Select the controller from drop down menu on top left
- 3. Click **Global View**

## **Storage Properties**

**Total capacity**: the combined capacity of each physical disk connected to controller **Configured capacity**: the amount of space used for creating arrays **Free Capacity**: total amount of space unused

**Physical Tab**
Controller										
	Controller Information									
Devices	Model Name:	RocketRAID 4520 SAS Controller								
Concernence in the second	EFI Version:	v1.1								
Rescan	Vendor: HighPoint Technologies, Inc.									
		Extended Information								
	IOP Model:	88RC9580 (9580B2)								
	CPU Temperature:	48°C								
	Board Temperature:	38°C								
	Power 3.3V Voltage:	3.26V								
	Power 2.5V Voltage:	2.50V								
	Power 1.8V Voltage:	1.81V								
	Power 1.5V Voltage:	1.53V								
	Power 1.0V Voltage:	1.02V								
	SDRAM Size:	512 M								
	Battery Installed:	Not Installed								
	Firmware Version: v1.7.0.0									
	SAS Address:	500193001030000								
	Update Firmware									
	Select the blf file to This process may tal	pdate Firmware. e some time.								
	Chasse File ) no file o	trand (Educate)								

The physical tab shows general and extended information about the controller you are using. Information about the firmware, BIOS, and operating temperatures are all located here. This information is useful for identifying what RAID controller model you have and to make sure you have the most updated version available.

The physical tab contains the following information:

- Controller Information
- Extended Information
- Update Firmware
- Physical Devices Information

#### **Controller Information**:

- Model Name: RocketRAID 2722 SAS Controller (for RS6422TS)
- BIOS Version: v1.12 (as of 5/5/2015)
- Vendor: HighPoint Technologies, Inc.

**Extended Information**: Gives you additional information concerning the HBA (Host Bus Adapter) in the enclosure

• **IOP Model**: IOP chip model number

- **CPU Temperature**: Displays computer temperature in Celcius (°C).
- **Board Temperature**: Displays the board temperature in Celcius (°C).
- **SDRAM Size:** SDRAM size of the HighPoint controller card
- Battery Installed: Battery Backup Unit (Not Applicable)
- **Firmware Version**: Firmware version of the HBA
- SAS address: the SAS address

Update Firmware: Allows you to update the controller BIOS through the WebGUI.

### Updating BIOS/Firmware

Keeping the firmware up to date ensures that your RAID controller the latest compatibility and performance updates.

- 1. Locate the latest firmware on our webpage at <u>www.highpoint-tech.com</u>
- 2. Extract the contents of the file
- 3. Read the README to ensure you have the correct firmware for your HBA **Note:** Your HBA name and properties can be found in the **WebGUI** > **Physical Tab**.
- 4. Locate the proper firmware file (e.g. rr2722.112, refer to the readme for exact name)
- 5. Click **Choose File** and browse to your firmware file
- 6. Click Submit
- 7. Reboot

	Update Firmware
Select the blf file to update Firmware. This process may take some time.	
Choose File no file selected	Submit

# **Obtaining Physical Device Information**

- 1. Log in to WebGUI
- 2. Click **Physical**
- 3. Click **Devices** located on the left panel

Physical Devices Information         Devices       Model       WDC WD40EFRX-68WT0N0-WD- WCC4ENSLV3U6       Capacity       4.00 TB         Rescan       Unplug       Revision       80.00A80       Read Ahead       Enabled Change         Max Free       0.00 GB       Max Free       0.00 GB       Enabled Change       Enabled Change         Status       Legacy       NCQ       Enabled Change         Serial Num       WD-WCC4ENSLV3U6       Identify LED       [ON] [OFF]         Device 1.2       Model       WDC WD60EFRX-68MYMN1-WD- WX11D74RHV7A       Capacity       6.00 TB         Device 1.3       Model       WDC WD30EFRX-68EUZN0-WD- WMC4N0DCFMUT       Capacity       3.00 TB	Controller       Devices       Model       WDC WD40EFRX-68WT0N0-WD- WCC4ENSLV3U6       Capacity       4.00 TB         Rescan       Unplug       Revision       80.00A80       Read Ahead       Enabled Change         Unplug       Revision       80.00A80       Read Ahead       Enabled Change         Max Free       0.00 GB       Max Free       0.00 GB       Enabled Change         Serial Num       WD-WCC4ENSLV3U6       Identify LED       [ON] [OFF]         Device_1.2       Model       WDC WD60EFRX-68MYMN1-WD- WX11D74RHV7A       Capacity       6.00 TB         Device_1.3       Model       WDC WD30EFRX-68EUZN0-WD- WMC4N0DCFMUT       Capacity       3.00 TB         Device_1.4       Model       WDC WD40EFRX-68WT0N0-WD- WCC4EHYCFZXL       Capacity       4.00 TB	Global View	Physic	cal Logi	cal Setti	ng Event SHI	Recover	Logout Help
Devices       Model       WDC WD40EFRX-68WT0N0-WD- Capacity       4.00 TB         Rescan       Unplug       Revision       80.00A80       Read Ahead       Enabled Change         Unplug       Revision       1/1       Write Cache       Enabled Change         Max Free       0.00 GB       Status       Legacy       NCQ       Enabled Change         Serial Num       WDC WD60EFRX-68MYMN1-WD-       Capacity       6.00 TB         Device_1_2       Model       WDC WD30EFRX-68EUZN0-WD-       Capacity       6.00 TB         Device_1_3       Model       WDC WD30EFRX-68EUZN0-WD-       Capacity       3.00 TB	Devices       Model       WDC WD40EFRX-68WT0N0-WD- Capacity WCC4ENSLV3U6       4.00 TB         Rescan       Unplug       Revision       80.00A80       Read Ahead       Enabled Change         Unplug       Revision       1/1       Write Cache       Enabled Change         Max Free       0.00 GB       Hamber Cache       Enabled Change         Serial Num       WD-WCC4ENSLV3U6       Identify LED       [ON] [OFF]         Device 1.2       Model       WDC WD60EFRX-68MYMN1-WD- Capacity       6.00 TB         Device 1.3       Model       WDC WD30EFRX-68EUZN0-WD- Capacity       3.00 TB         Device 1.4       Model       WDC WD40EFRX-68WT0N0-WD- Capacity       4.00 TB	Controller			P	hysical Devices Inform	nation	
Rescan       Unplug       Revision       80.00A80       Read Ahead       Enabled Change         Location       1/1       Write Cache       Enabled Change         Max Free       0.00 GB       Enabled Change         Status       Legacy       NCQ       Enabled Change         Serial Num       WD-WCC4ENSLV3U6       Identify LED       [ON] [OFF]         Device_1_2       Model       WDC WD60EFRX-68MYMN1-WD- WX11D74RHV7A       Capacity       6.00 TB         Device_1_3       Model       WDC WD30EFRX-68EUZN0-WD- WMC4N0DCFMUT       Capacity       3.00 TB	Rescan       Unplug       Revision       80.00A80       Read Ahead       Enabled Change         Location       1/1       Write Cache       Enabled Change         Max Free       0.00 GB       Status       Legacy       NCQ       Enabled Change         Serial Num       WD-WCC4ENSLV3U6       Identify LED       [ON] [OFF]         Device_1_2       Model       WDC WD60EFRX-68MYMN1-WD-       Capacity       6.00 TB         Device_1_3       Model       WDC WD30EFRX-68EUZN0-WD-       Capacity       3.00 TB         Device_1_4       Model       WDC WD40EFRX-68WT0N0-WD-       Capacity       4.00 TB	Devices		Device_1_1	Model	WDC WD40EFRX-68WT0N0-W WCC4ENSLV3U6	<sup>/D-</sup> Capacity	4.00 TB
Location       1/1       Write Cache       Enabled Change         Max Free       0.00 GB       Enabled Change         Status       Legacy       NCQ       Enabled Change         Serial Num       WD-WCC4ENSLV3U6       Identify LED       [ON] [OFF]         Device_1_2       Model       WDC WD60EFRX-68MYMN1-WD- WX11D74RHV7A       Capacity       6.00 TB         Device_1_3       Model       WDC WD30EFRX-68EUZN0-WD- WMC4N0DCFMUT       Capacity       3.00 TB	Location       1/1       Write Cache       Enabled Change         Max Free       0.00 GB       Status       Legacy       NCQ       Enabled Change         Serial Num       WD-WCC4ENSLV3U6       Identify LED       [ON] [OFF]         Device_1_2       Model       WDC WD60EFRX-68MYMN1-WD- Capacity       6.00 TB         Device_1_3       Model       WDC WD00EFRX-68EUZNO-WD- Capacity       3.00 TB         Device_1_4       Model       WDC WD40EFRX-68WT0N0-WD- Capacity       4.00 TB	Rescan		Unplug	Revision	80.00A80	Read Ahead	Enabled Change
Max Free       0.00 GB       NCQ       Enabled Change         Status       Legacy       NCQ       Enabled Change         Serial Num       WD-WCC4ENSLV3U6       Identify LED       [ON] [OFF]         Device_1_2       Model       WDC WD60EFRX-68MYMN1-WD- Capacity       6.00 TB         Device_1_3       Model       WDC WD30EFRX-68EUZN0-WD- Capacity       3.00 TB	Max Free Status Serial Num0.00 GBNCQEnabled Change [ON] [OFF]Device_1_2ModelWD-WCC4ENSLV3U6Identify LED[ON] [OFF]Device_1_3ModelWDC WD60EFRX-68BUZN0-WD- WMC4N0DCFMUTCapacity6.00 TBDevice_1_4ModelWDC WD40EFRX-68BUZN0-WD- WCC4EHYCFZXLCapacity3.00 TB			1.000	Location	1/1	Write Cache	Enabled Change
Status     Legacy     NCQ     Enabled Change       Serial Num     WD-WCC4ENSLV3U6     Identify LED     [ON] [OFF]       Device_1_2     Model     WDC WD60EFRX-68MYMN1-WD- WX11D74RHV7A     Capacity     6.00 TB       Device_1_3     Model     WDC WD30EFRX-68EUZN0-WD- WMC4N0DCFMUT     Capacity     3.00 TB	Status     Legacy     NCQ     Enabled Change       Serial Num     WD-WCC4ENSLV3U6     Identify LED     [ON] [OFF]       Device_1.2     Model     WDC WD60EFRX-68MYMN1-WD- WX11D74RHV7A     Capacity     6.00 TB       Device_1.3     Model     WDC WD30EFRX-68EUZN0-WD- WMC4N0DCFMUT     Capacity     3.00 TB       Device_1.4     Model     WDC WD40EFRX-68WT0N0-WD- WCC4EHYCFZXL     Capacity     4.00 TB				Max Free	0.00 GB		
Serial Num     WD-WCC4ENSLV3U6     Identify LED     [ON] [OFF]       Device_1_2     Model     WDC WD60EFRX-68MYMN1-WD- WX11D74RHV7A     Capacity     6.00 TB       Device_1_3     Model     WDC WD30EFRX-68EUZN0-WD- WMC4N0DCFMUT     Capacity     3.00 TB	Serial NumWD-WCC4ENSLV3U6Identify LED[ON] [OFF]Device_1_2ModelWDC WD60EFRX-68MYMN1-WD- WX11D74RHV7ACapacity6.00 TBDevice_1_3ModelWDC WD30EFRX-68EUZN0-WD- WMC4N0DCFMUTCapacity3.00 TBDevice_1_4ModelWDC WD40EFRX-68WT0N0-WD- WCC4EHYCFZXLCapacity4.00 TB				Status	Legacy	NCQ	Enabled Change
Device_1_2       Model       WDC WD60EFRX-68MYMN1-WD- Capacity       6.00 TB         Device_1_3       Model       WDC WD30EFRX-68EUZN0-WD- Capacity       3.00 TB	Device_1_2       Model       WDC WD60EFRX-68MYMN1-WD- Capacity       6.00 TB         Device_1_3       Model       WDC WD30EFRX-68EUZN0-WD- Capacity       3.00 TB         Device_1_4       Model       WDC WD40EFRX-68WT0N0-WD- Capacity       4.00 TB				Serial Num	WD-WCC4ENSLV3U6	Identify LED	[ON] [OFF]
Device 1.3 Model WDC WD30EFRX-68EUZN0-WD- Capacity 3.00 TB WMC4N0DCFMUT 3.00 TB	Device_1_3       Model       WDC WD30EFRX-68EUZN0-WD- Capacity       3.00 TB         WMC4N0DCFMUT       WDC WD40EFRX-68WT0N0-WD- Capacity       4.00 TB         WCC4EHYCFZXL       WCC4EHYCFZXL       4.00 TB		5	Device 1_2	Model	WDC WD60EFRX-68MYMN1-W WX11D74RHV7A	<sup>VD-</sup> Capacity	6.00 TB
	Device_1_4         Model         WDC WD40EFRX-68WT0N0-WD- Capacity         4.00 TB           WCC4EHYCFZXL         WCC4EHYCFZXL         4.00 TB		Ŀ	Device_1_3	Model	WDC WD30EFRX-68EUZN0-W WMC4N0DCFMUT	D- Capacity	3.00 TB
Device_1_4 Model     WDC WD40EFRX-68WT0N0-WD-     Capacity     4.00 TB     WCC4EHYCFZXL				Device_1_4	Model	WDC WD40EFRX-68WT0N0-W WCC4EHYCFZXL	D- Capacity	4.00 TB

The following properties are part of the **Physical Devices Information** box under the physical tab.

- **Model** Model number of the physical drive
- **Capacity** Total capacity of the physical drive
- **Revision** HDD device firmware revision number
- **Read Ahead**\* (Enable/Disable) Disk read ahead.
- Location Device location (example: 1/2 states controller 1, slot 2)
- Write Cache\* (Enable/Disable) the disk write cache
- Max Free space on disk that is not configured in an array
- Status (Normal, disabled, critical) status of the disk
- NCQ\* (Enable/Disable) Native Command Queuing
- Serial Number serial number of the physical disk
- **Identify LED\*** On/Off toggle the IDENTIFY (RED) on the front panel
- **Unplug** Safely ejects selected disk. Other methods of disk removal will trigger alarm if enabled.

\* Disk properties that can be adjusted.

#### **Read Ahead**

Enabling disk read ahead will speed up read operations by pre-fetching data and loading it into RAM.

#### Write Cache

Enabling write cache will speed up write operations.

#### NCQ (Native Command Queuing)

A setting that allows disks to queue up and reorder I/O commands for maximum efficiency.

#### **Identify LED**

The Disk tray LED lights on the front panel can be toggled ON or OFF.

#### Rescan

Clicking rescan will immediately signal the controller to scan for any changes in the connection. Clicking this button will also stop any alarm if currently ringing.

### Logical Tab

Global View	Physical L	ogical <mark>Sett</mark>	ing Ev	vent SH	I Recov	er Logout	Help
Create Array			Logical	Device In	formation	1	
Spare Pool	Name	Туре	Capacity	BlockSize	SectorSize	OS Name	Status
ogical Device	Device_1_	1 Hard Disk	4.00 TB			HPT DISK 0_3	Legacy
Rescan	Device_1_	2 Hard Disk	6.00 TB			HPT DISK 0_2	Legacy
Reener Mute	Device_1_	3 Hard Disk	3.00 ТВ			HPT DISK 0_1	Legacy
	Device_1_4	4 Hard Disk	4.00 TB			HPT DISK 0_0	Legacy
	Location	Model	Physical	Device I	nformation	n Capacity 4.00 TB	Max Free
	L 1/2	WDC WD60EFRX	6.00 TB	0.00 GB			
	L 1/3	WDC WD30EFRX	3.00 ТВ	0.00 GB			
	<b>L</b> 1/4	WDC WD40EFRX	-68WTONO-V	VD-WCC4EHY	CFZXL	4.00 TB	0.00 GB

The Logical tab is where you are edit, delete, and maintain your RAID configurations, as well as, adding drives to your spare pool. The logical tab has the following settings:

- Create Array
- Spare Pool
- Logical Device
- Rescan
- Beeper Mute

# Creating an Array

To create an array:

- 1. Log into the WebGUI
- 2. Select the proper **controller** from the drop down on the top left
- 3. Click Logical
- 4. Click Create Array

An array is a collection of physical disks that will be seen as one virtual drive by your Operating System (OS). The RS6422TS has a RocketRAID 2722 controller capable of creating the following array types

Global View	Physical Logical	Setting	Event	SHI Recove	er Logou	t Help
Create Array			Create /	Array		
spare Pool	Array Type:	IBOD(Volume)	\$			
ogical Device	Arrow Normol	Default	-			
escan	Array Name:	Default				
eeper Mute	Initialization Method:	Keep Old Data	÷			
	Cache Policy:	Write Back	\$			
	Block Size:	64K	*			
	Number of RAID5 member disks:	-1	÷			
		Select All	Location Mod	lel	Capacity	Max Free
			WD 1/1 68V WC	C WD40EFRX- VTONO-WD- C4ENSLV3U6	4.00 TB	0.00 GB
	Available Disks:		WD 1/2 68N WX	C WD60EFRX- IYMN1-WD- 11D74RHV7A	6.00 ТВ	0.00 GB
			WD 1/3 68E WM	C WD30EFRX- UZN0-WD- C4N0DCFMUT	3.00 ТВ	0.00 GB
			WD 1/4 68V WC	C WD40EFRX- VTONO-WD- C4EHYCFZXL	4.00 TB	0.00 GB
	Capacity: (According to the max free space on the selected disks)	Maximum	(MB)			
	DV Mode:	Disable ‡		Margin:		5% ‡
	(Enable special cache ploice for DV/sequential write applications)			(Adjust the large more stable performance the main performance.)	r marge will ac ormance, but it ximume write	hive
	Disk Cache Policy:	Unchange	\$			
			Creat	2		

#### Array Type:

- JBOD Just a Bunch of Disks
- RAID 0 Striping
- RAID 1 Mirroring
- RAID 5 Rotating Parity bit
- RAID 1/0 Striping of Mirrored Drives
- RAID 5/0 Striping of Distributed Parity
- RAID 6 Double Parity Bit

Each RAID level has its pros and cons based on the application you use it for (**Note**: Refer to **RAID level Quick Reference**)

**Array Name:** the name that will be displayed in Logical Device Information (Default: RAID\_<level>\_<array number>)

**Initialization Method**: Initialization of a disk sets all data bits to 0, essentially clearing all the data on the drive. It is important to initialize disks since previous data physically stored on the drive may interfere with new data.

- Keep Old Data: This option skips the initialization process and all data on each physical disk of the array will be untouched.
- Quick Init: This option grants immediate access to the RAID array by skipping the initialization process, but it will delete all data. **Note**: Skipping initialization is generally not recommended since residual data on disks may interfere with new data in the future.
- Foreground: The array initialization process will be set at high priority. During this time array will be non-accessible, but initialization completion time will be shorter.
- Background: The array initialization process will have a lower priority. During this time array will be accessible, but initialization completion time will be longer.

Note 1: Initializing takes a significant amount of time (approximately 2 hours per 1 TB).

#### Background and Foreground Initialization

Fully initializing the array will completely zero out the data on the disks, meaning the disk will be completely wiped and every bit on the disk will be set to 0. Foregoing initialization means the array will still be created, and you can still write new data onto the array. But when your array requires rebuilding, residual data left behind may interfere with the process.

#### Cache Policy (Default: Write Back)

**Write Back** – Any data written to the array will be stored as cache, resulting in better I/O performance at the risk of data failures due to power outages. Data will be stored as cache before it is physically written to the disk; when a power outage occurs, any data in the cache will be lost.

**Write Through** – Data written to an array is directly written onto the disk, meaning lower write performance for higher data availability. Without cache acting as a buffer, write performance will be noticeably slower but data loss due to power outages or other failures is significantly minimized.

#### Capacity (Default: Maximum)

The total amount of space you want the RAID array to take up. When creating RAID levels, disk capacities are limited by the smallest disk.

An example of how disk capacities are limited by smallest disk.

- You have 3 drives connected to the enclosure.
- First drive is 6 TB, second is 4 TB, and third drive is 2 TB.
- After creating a RAID level 5 using all three drives and maximum capacity
- The first drive will have 4 TB, the second 2 TB, and the third drive 0 TB free capacity
- The free capacity on the first and second drive can be used to create a separate array.

You may also choose how much space each array will take. You can use the remaining space to create another array (up to 4 arrays are supported)

#### Sector Size (Default: 512B)

**Note:** For current operating systems, this option is already implemented so changing it in the WebGUI is not necessary.

This option will set the sector size of your virtual drive, and physical sector sizes on your physical disks will remain the same. A sector is the smallest physical storage unit on a disk. The default sector size is 512 B since it is the most common sector size in disks today.

## Adding Spare Disks

Spare disks are physical disks that will immediately replace critical disks in an array.

Controller(1): 4520 ‡	]	High	Point Technologies, Inc
Global View	Physical Lo	ogical Setting Event SHI Recover Logout	Help
Create Array		Spare Pool	
Spare Pool	Remove Spare		
Logical Device		Available Disks	
Rescan	Device_	1_1 WDC WD40EFRX-68WT0N0-WD-WCC4ENSLV3U6	4.00 TB
Beeper Mute	Device_	1_2 WDC WD60EFRX-68MYMN1-WD-WX11D74RHV7A	6.00 TB
	Device_	1_3 WDC WD30EFRX-68EUZN0-WD-WMC4N0DCFMUT	3.00 TB
	Add Spare	1_4 WDC WD40EFRX-68WT0N0-WD-WCC4EHYCFZXL	4.00 TB

To add spare disks:

- 1. Log in WebGUI
- 2. Click Logical
- 3. Click **Spare Pool**
- 4. Check the box for the disk you want as a spare from Available Disks
- 5. Click Add Spare

Disks added to the spare pool will show under **Spare Pool** and can be removed by checking the disk checkbox from **Spare Pool** > Click **Remove Spare** 

Physical drives marked as a spare will automatically be added to an array whenever there is a disk failure. Having this feature minimizes the chances of a data loss by reducing the time an array is in critical status.

### **Obtaining Logical Device Information**

Logical device tab is the default page upon clicking the Logical tab of the WebGUI. This page contains information about your RAID arrays and individual disks your system detects.

#### **Logical Device Information**

Arrays you create and the properties associated with them will appear here.

#### Maintenance

Once an array has been created, you have the option maintain it.

#### **Array Information**

Clicking on the maintenance button will show you the Array information box. Different array statuses (Normal, critical, disabled) will have different maintenance options.

### Normal Status

		Lo	gical De	evice Info	ormation			
Name RAID_5_0	Type RAID 5	Capacity 9.00 TB	BlockSize 64k	SectorSize 512B	OS Name HPT DISK 0_0	Status Normal	Ma	intenance
			Arı	ray Infor	mation			
Location N 1/1 N 1/2 N 1/3 N 1/4 N	Model WDC WD4 WDC WD6 WDC WD3 WDC WD4		_5_0 evice_1_1 evice_1_2 evice_1_3 evice_1_4	Delete Unplug Verify Write Back Disable ‡ Rei JBOD(Volume)	Change Cac Change Margin name     ORLM	he Policy	city TB TB TB TB	Max Free 1.00 TB 3.00 TB 0.00 GB 1.00 TB
						Close		

A Normal Status Array has the following options

- Delete
- Unplug
- Verify
- Change Cache Policy
- Change Margin
- Rename
- ORLM

**Delete** – deletes the selected RAID array

Unplug – powers off the selected RAID array

**Verify** – verifies the integrity of the RAID array

Change Cache Policy - Toggles between Write through and Write back cache

**Change Margin** – Adjust margin when DV mode is enabled

**Rename** – renames the RAID array

OCE/ORLM - Online Capacity Expansion / Online RAID Level Migration

# **Critical Status**

		Lo	ogical De	evice Info	ormation			
Name	Туре	Capacity	BlockSize	SectorSize	OS Name	Status		
PAID_5_0	RAID 5	9.00 ТВ	64k	512B	HPT DISK 0_0	Critical	Ma	aintenance
			Arı	ay Inform	nation			
		🐕 RAID	_5_0	Delete				
Location	Model		evice_1_1	Unplug Add Disk			city	Max Free
<b>1/1</b>	WDC WD4	┙┝═▫	evice_1_2	Write Back	¢ Change Ca	che Policy	тв	1.00 TB
<b>1/2</b>	WDC WD6	× ⊢∍•	evice_1_3	Disable 🗧	Change Margin		тв	3.00 TB
<b>1/3</b>	WDC WD3	u Lego	evice_1_4	JBOD(Volume)	¢ ORLM		тв	0.00 GB
<b>2</b> 1/4	WDC WD4	H <mark>r</mark>	••••••••••••••••••••••••••••••••••••••				тв	1.00 TB
						Close		

A critical status array has all the normal status options except the following:

- The Array can no longer be renamed
- Add disk replaces the verify disk option

Once array status changes to critical, the faulty disk will be taken offline and you can either:

- Reinsert the same disk
- Insert new disk

Reinserting the same disk should trigger rebuilding status, since data on the disk would be recognized.

If you insert a new disk, clicking **add disk** will give you the option to select that disk and add it to the array.

## **Disabled Status**

Name Type C RAID_5_0 RAID 5 9	Capacity BlockSize	SectorSize	00.1		
RAID_5_0 RAID 5 9			OS Name	Status	
-	.00 TB 64k	512B		Disabled	<b>Maintenance</b>
	Array Ir	nformatio	n		
	RAID_5_0				
Location Model	Device_1_1		Delete	Capac	tity Max Free
🚍 1/1 WDC WD40	- Device_1_2		Unplug	4.00	гв 1.00 тв
🚍 1/2 WDC WD60	- Device_1_3		Recover	6.00	гв 3.00 тв
🛀 1/3 WDC WD30	Device_1_4			3.00	TB 0.00 GB
🛀 1/4 WDC WD40			Close	4.00	гв 1.00 тв

A disabled status array means that your RAID level does not have enough disks to function.

- Your data will be inaccessible
- Rebuilding will not trigger, since RAID does not have enough parity data to rebuild upon

Your options in Maintenance are:

- Delete
- Unplug
- Recover

**Delete** – will delete the array

**Unplug** – will take array offline, making it safe to remove **Recover** – will attempt to recover the array using the list from the recover tab

### Expanding an Existing Array

**Important:** It is recommended to **Verify/Rebuild** your array before **Expanding** or **Migrating**. Once you start an **OCE/ORLM** procedure, you *can* stop the process but it **must** be resumed until completion.

To add more capacity to your current configuration follow these steps:

- 1. Log in WebGUI
- 2. Select desired controller from drop down menu on top left
- 3. Click Logical
- 4. Click **Maintenance** for the array you want to change

- Select a **different** RAID level to **Migrate**
- Select the **same** RAID level to **Expand**

Ar	ray Info	ormat	ion
RAID_5_0	Delete Unplug Verify		
Device 1 2	Write Back	÷	Change Cache Policy
Device 1.2		Rename	
Device_1_3	JBOD(Volu	me) 🗧	ORLM
			Close

- 5. **Important**: Record all the physical drives currently in array.
- 6. Click ORLM
- 7. Select the physical drives you recorded earlier and the drives you want to add
- 8. Click Submit

Upon submission, you will receive a prompt stating ORLM created successfully.

Ĉ	http://localhost:7402 ORLM destination RAID 5 Array 'RAID_5_1' has been created successfully (Disk 1:WDC WD2003FZEX-00Z4SA0-WD-WMC5C0D010MK, 1/1; Disk 2:WDC WD2003FZEX-00Z4SA0-WD- WMC5C0D1RJUS, 1/2; Disk 3:WDC WD60EFRX-68MYMN1-WD-WX11D74RH86K, 1/3; Disk 4:WDC WD2003FZEX-00Z4SA0-WD-WMC5C0D0WZ56, 1/4). OK

The Logical Device Information will change status to migrating.

Physical Device Information

Controller(1): 4520 💠							High	Point Technologies, Inc.
Global View	Physical L	ogical	Setting	Eve	nt S	HI Recov	er Logout	Help
Create Array			Lo	gical D	evice I	nformation		
Spare Pool	Name	Туре	Capacity	BlockSize	SectorSiz	e OS Name	Status	
Logical Device	RAID_5_0	RAID 5	4.00 TB	64k	512B	HPT DISK 1_3	Migrating 0%	Maintenance
Rescan								3
Beeper Mute	🙀 RAID_5_1	RAID 5	6.00 ТВ	64k	512B		Migrating 0%	Maintenance
	Device_1_6	Hard Disk	6.00 ТВ			HPT DISK 1_0	Legacy	
	Device_1_7	Hard Disk	6.00 ТВ			HPT DISK 1_1	Legacy	
	Device_1_8	Hard Disk	6.00 ТВ			HPT DISK 1_2	Legacy	

- Location which controller and port the drive is located in
- Model model number of the drive connected
- **Capacity** total capacity of the drive
- Max Free total capacity that is not configured

#### Rescan

Clicking rescan will force drivers to report array status. For any disk(s) you hot plug into the device, do not click rescan until all physical drives are detected and appear under Logical Device Information.

### Beeper Mute

The controller emits a beeping sound whenever an

- Array falls into **critical** status
- Array falls into **disabled** status
- You unplug a disk
- Your disk fails due to bad sectors
- SMART sensors anticipate drive failure

If device is currently beeping, clicking Beeper Mute will mute the sound immediately. *Note*: This button does not permanently mute the alarm. In order to permanently mute the alarm, go to **Setting** > **Enable audible alarm** > **Disabled**.

### Setting Tab

Global View	Physical Logical Setting	Event SHI Recover	Logout Help	
System		System Setting		
Email	Enable auto rebuild.	Disabled \$		
	Enable Continue Rebuilding on error.	Disabled +		
	Enable audible alarm.	Disabled \$		
	Set Spindown Idle Disk(minutes):	Disabled *		
	Destrict to locality of the state of the sta			
	Restrict to localnost access.	Disabled ÷		
	Set Rebuild Priority:	Medium ÷		
	Submit	7402		
	P	assword Setting		
	Password:			
	Confirm:			
	Submit			

Under this tab, user can

- Enable auto-rebuilding
- Enable rebuilding on error
- Turn audible alarm on/off
- Set spindown time for idle disks
- Restrict to localhost
- Set rebuild priority
- Change port number
- Change WebGUI password

### System Settings

#### Enable auto rebuild (default: Enabled)

When a physical drive fails, the controller will take the drive offline. Once you reinsert or replace the disk, the controller will not automatically rebuild the array unless this option is enabled.

#### Enable continue rebuilding on error (default: Enabled)

When enabled, the rebuilding process will ignore bad disk sectors and continue rebuilding until completion. When rebuild is finished, the data may be accessible but data inconsistency due to ignored bad sectors may cause problems in the future. If this option is enabled, HighPoint recommends user to check the event log for bad sectors.

#### Enable audible alarm (default: Enabled)

When a physical disk fails, the controller will emit an audible sound signaling failure. This option mutes the alarm.

#### Set Spindown Idle Disk (minutes) (default: Disabled)

When set, physical drives will spindown a certain amount of time after disk activity ceases. Only 10, 20, 30, 60, 120, 180, 240 minutes setting are available.

#### Restrict to localhost access (default: Enabled)

Remote access to the controller will be restricted when **enabled**, other users in your network will be unable to remotely log in to the WebGUI.

#### Rebuild Priority (default: Medium)

You can specify the amount of system resources you want to dedicate to rebuilding the array. There are 5 levels of priority [Lowest, Low, Medium, High, Highest]

#### Port Number (default: 7402)

The default port that the HighPoint WebGUI listens on is 7402. You may change it to any open port.

### **Password Setting**

## Changing your WebGUI password

Under Password Setting type your new password and confirm it, then click submit.

### Recovering your WebGUI password

If you wish to revert to the default password: hpt, delete the file hptuser.dat.

For Mac Users:

- 1. Open Terminal
- 2. Type or navigate to cd /usr/share/hpt
- 3. Type rm **hptuser.dat**, to remove the file
- 4. Reboot

For **Windows** Users:

- 1. Open file explorer
- 2. Navigate to C:/Windows/
- 3. Delete **hptuser.dat**
- 4. Reboot

### **Email Setting**

The following topics are covered under email:

- SMTP Setting
- Adding Recipients

You can set the controller to send an email out to recipients of your choosing when certain events (refer to Event Tab) trigger.

### **SMTP** settings

SMTP Setting				
Enable Event Notification				
Mail From (E-mail address):				
Login Name:				
Password:				
SMIP Port: Support SSL:	<b>I</b>			
	Change Setting			

To set up email alerts:

- 1. Check the Enable Event Notification box.
- 2. Enter the ISP server address name or SMTP name
- 3. Type in the email address of the **sender** (email account that is going to **send** the alert)
- 4. Type in the account name and password of the sender
- 5. Type in the SMTP port (default: 25)
- 6. Check support SSL box if SSL is supported by your ISP (port value will change to **465**).

*Note*: After you click 'Change Setting' the password box will become blank.

### How to Add Recipients

Recipients				
E-mail Name Event Level		Event Level		
	Add I	Recipient		
E-mail:	[			
Name:				
Event Level: Add Test	Information Warning Error			

You can add multiple email addresses as receivers of a notice.

- 1. Type the email of the recipient in the **E-mail** text box
- 2. Type the name of the recipient in the **Name** text box
- 3. Check which type(s) of events will trigger an email in the respective **Event Level** check boxes
- 4. (Optional) Click test to confirm settings are correct by sending out a test email
- 5. Click **add** to add the recipient to recipient list

6. The added recipient will display in under **Recipients** 

The email will send to your recipients the output recorded in the event log. Example email message:

HighPoint RAID Management Software Mail Notification				
Sent: Mon 5/4/2015 4:36 PM To: test0				
Mon, 04 May 2015 23:35:40 GMT: [HPTMV9580IOPController]: Plugging device detected.('WDC WD40EFRX-68WT0N0-WD-WCC4EHYCFZXL' at Controller2-Channel8)				

#### Figure 10. Example event log email

### Recover Tab

Controller(1): 4520 ‡	HighPoint Technologies, Inc.
Global View Physical Logical Setting Event SHI Recov	ver Logout Help
Recover List	
Total items:(0), valid items:(0), only valid items are displayed.	
Backup To File Clear All	
Recover Array	
Update Recover List	
Select the rec file to update Recover List.	
This process may take some time.	
Choose File no file selected Submit	
HighPoint RAID Management 2.6.8 Copyright (c) 1996-2015 HighPoint Technologies, Inc. All Rights Reserved	

Previously created arrays will be stored under this tab. Recovering an array from here will attempt to recover a 'disabled' array and make it 'normal'.

The Recover List will list all your previous and current created arrays. Each entry will list the following properties:

- Array name
- RAID level
- Array Capacity

- Time created ( YYYY/MM/DD, HH/MM/SS, 24 hr clock format)
- Location of physical drives
- Model of physical drives

**Important:** When recovering an array it is important to note the **location** and **model** of each physical drive because you can **only** recover using those **exact** positions and drive model.

### How to Backup your Recover List

The recover list is a record of your previously created arrays containing the model and location information of your physical drives. Recovering from the list could help bring a **disabled** array back to **normal** status for emergency data retrieval.

To backup your recover list:

- 1. Log in to WebGUI
- 2. Click **Recover** Tab
- 3. Click **Backup to File** *Note*: The file will be saved as **hptrec.rec**

### How to Reload your Backup Recover List

In the case that you cleared the recover list or it does not appear for any reason, you can recover it if you saved the list beforehand.

To reload your recover list

- 1. Log in to WebGUI
- 2. Click **Recover** Tab
- 3. Under Update Recover List click Browse...
- 4. Locate your previously saved **hptrec.rec** file and select it *Note*: loading a back up recover list will completely replace the current recover list.
- 5. Click Submit

#### Event Tab

In the event tab, you can see log entries associated with the HighPoint device. The event log provides useful information when troubleshooting your set up.

In the event tab, there are four options available:

• Download – save the log file on your computer

- Clear clears all log entries
- Prev view previous log page
- Next view next log page

Icon	Name	Definition
Ð	Information	<ul> <li>Includes general administrative tasks:</li> <li>Create/delete arrays</li> <li>Configuring spares</li> <li>Rebuilding arrays</li> <li>Configuring event notifications</li> <li>Configuring maintenance</li> </ul>
Â	Warning	<ul> <li>Alerts issued by the Host Adapter: <ul> <li>High temperatures</li> <li>Sector errors</li> <li>Communication errors</li> <li>Verification errors</li> </ul> </li> </ul>
8	Error	Hardware related problems • Hard disk failure • Broken errors • Memory failure

# Table 3. Event Log Icon Guide

The event view is a basic error logging tool built into the HighPoint WebGUI.

SHI (Storage Health Inspector)

- S.M.A.R.T Attributes
- HDD Temperature Threshold
- Storage Health Inspector Scheduling

The SHI outputs information collected using SMART (Self-Monitoring Analysis and Reporting Technology) Hard Drive Technology. The data provided on this tab helps you to anticipate any disk failures based on a variety of monitored hard disk properties.

Technologies, I						
Logout Help	Recover	SHI	Setting Event	ysical Logical	w Ph	Global Vie
<u>Schedu</u>						
	•)	tor(SH)	e Health Inspec	Storag		
Pred Device Status	Bad Sectors Found & Repaired	٩F	RAID	Device Serial Number	Port#	ontroller ID
OK SMA	None	105	RAID_0_1	WD-WCC4ENSLV3U6	5	
OK SMA	None	105	RAID_0_1	WD-WX11D74RHV7A	6	
OK SMA	None	102	RAID_0_1	WD-WMC4N0DCFMUT	7	
OK <u>SMA</u>	None	105	RAID_0_1	WD-WCC4EHYCFZXL	8	
		reshold	emperature Th	HDD		
			Set	hreshold (F): 140	nperature t	et harddisk ter

### How to Enable SMART Monitoring

To access SMART attributes of an individual disk:

- 1. Log in to WebGUI (**default user**: RAID **password**: hpt)
- 2. Select the proper controller using the drop down menu on the top left
- 3. Click the **SHI** tab
- 4. Click **SMART** on the desired disk
- 5. Click **Enable** to enable SMART monitoring

# Disabling SMART monitoring

You have the option the disable SMART monitoring on each individual disk. To disable:

- 1. Select the proper controller using the drop down menu on the top left
- 2. Click the SHI tab
- 3. Click **SMART** on desired disk
- 4. Click Disable

**Note**: Disabling SMART will prompt the Storage Health Inspector to change the disk status to 'Failed'. The alarm will **not** alert you when this setting is changed. And any potential warnings due to S.M.A.R.T attribute technology will not

### How to Change HDD Temperature Threshold

To ensure hard disk temperatures remain cool, enable SMART to monitor disk temperatures. In **SHI**, you can set a threshold so that the WebGUI or controller alarm (if enabled) can warn you when physical disks get too hot.

- 1. Log in to WebGUI
- 2. Select the controller from the drop down on the top left
- 3. Click SHI
- 4. Type the desired harddisk temperature threshold (°*F*)
- 5. Click Set

### How to Use the Health Inspector Scheduler

Controller(1): 4520 - High Point Technologies, Inc.
Global View Physical Logical Setting Event SHI Recover Logout Help
Tasks List
Name       Description         test0       Check all disks every week on Tuesday at 16:20:0         Delete       Delete
New Verify Task
RAID_5_1 Task Name:
• Occurs one time on 2015 - 5 - 5 at 0 : 0 : 0
Schedule:
Start date: 2015-5-5
Submit
Health Inspector Scheduler
Task Name: Select a Schedule: Obaily Weekly Bi-Weekly Monthly
Select a time: Sunday $\Rightarrow$ 1 0:0:0 Submit
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The **Health Inspector Scheduler** (**HIS**) enables you to schedule disk/array checkups to ensure disks/array are functioning optimally.

# How to Create a New Verify Task

All arrays will appear under New Verify Task

- 1. Log in to WebGUI
- 2. Select the proper controller from the top left drop down
- 3. Click SHI
- 4. Click **Schedule**
- 5. Select the array you want to schedule the verify task
- 6. Type the name in **Task Name** entry box
- 7. Choose whether you want to schedule
  - One time verify task on specific date (YYYY-MM-DD) at (HH:MM:SS, 24-hr clock)
  - Or a specific schedule you can adjust based on Daily, Weekly, or Monthly options
- 8. Click Submit
- 9. Your entry will appear under Tasks List

*Note*: New Verify Task box only appears if you have normal status arrays. If you have a critical array, New Rebuild Task will replace New Verify Task.

# Section 6: Formatting the RAID Volumes

After creating a RAID array (see **page 43**), your operating system will recognize that array as a logical disk. But it will not be accessible until it is formatted by the operating system.

Format the volume when you have finished the following procedures:

- Set up the Enclosure
- Set up the RAID Controller
- Installed Drivers
- Created an Array

#### For Windows Users:

1. Use Windows Search Box and search **Disk Management.** (Search results may show **Create and format hard disk partitions**)

Settings Results for "disk management"	Search Settings	
Create and format hard disk partitions	disk management	× 🔎
	Apps	0
	Settings	1
	Files	0

- 2. Alternatively, Go to **Control Panel**
- 3. Under Administrative Tools, click Create and format hard disk partitions
  - If you just created the array, a prompt will appear after clicking disk management asking you to initialize the disk
  - MBR partition table is mainly for bootable drives and has a 2 TB limit. If your PC motherboard uses legacy BIOS, you will most likely need to use MBR for bootable drives.
    - GPT partition table has no capacity limit, but cannot be bootable unless your PC motherboard contains UEFI firmware.

Initialize Disk	x
You must initialize a disk before Logical Disk Manager can access it. Select disks: Disk 2	
Use the following partition style for the selected disks: O MBR (Master Boot Record) © GPT (GUID Partition Table) Note: The GPT partition style is not recognized by all previous versions of Windows.	
OK Cancel	

- 4. Once initialized, right click the unallocated disk space for your disk
- 5. click **New Simple Volume**

Disk 2 Basic 9314.75 GB Online Unallocated		New Simple Volume	
	<u> ////////////////////////////////////</u>	New Spanned Volume New Striped Volume	=
Unallocated	Primary partition	New Mirrored Volume New RAID-5 Volume	×
		Properties	
		Help	

6. Follow the instructions on screen to receive a drive letter

Assign Drive Letter or Path For easier access, you can assign a drive letter or drive path to your partition.	New Simple Volume V	Wizard ×
<ul> <li>Assign the following drive letter:</li> <li>Mount in the following empty NTFS folder:</li> <li>Mount in the following empty NTFS folder:</li> <li>Broe</li> <li>Broe</li> <li>F</li> <li>G</li> <li>H</li> <li>J</li> <li>K</li> </ul>	Assign Drive Letter or Path For easier access, you can assign a drive letter or drive	e path to your partition.
<pre></pre>	Assign the following drive letter:     Mount in the following empty NTFS folder:     Do not assign a drive letter or drive path	E V A B B F G H H I J K L M N O P Q Q R R S S T U V V V V V V V V

7. Once finished, the drive will appear in your OS with the letter you assigned



Figure 11. Disk formatted as NTFS and assigned drive letter D:

Your disk may initially appear offline to the operating system, and you may have to bring it online:

1. In Disk Management, right click the disk you wish to bring online.

Disk 1     Unknow(     9314.88 (	Online	
Offline 🤇	Properties	
	Help	

2. The disk status will change to Not Initialized; right click the disk again to initialize it.

Disk 1 Unknown	Initialize Disk
9314.88 GB Not Initialized	Offline
	Properties
	Help

#### For Mac Users:

1. After creating an array using the WebGUI, you will be prompted to **initialize**.

The disk you inserted was not readable by this computer.			
Initialize Ignore Eject			

- 2. Click Initialize (this will simply open Disk Utility)
- 3. Select your newly created array
- 4. Click Erase
- 5. Select a Format (recommended Mac OS Extended (Journaled))
- 6. Choose a **name** for your RAID volume
- 7. Click Erase...



8. The Volume will appear on your desktop



# Section 7: Troubleshooting

This section provides guidelines to some problems you may encounter:

- Handling Critical Arrays
- Handling Disabled Arrays
- PC hangs when card is installed.

## Handling Critical Arrays

When your disk status turns critical, that means your array as a whole is still accessible, but a disk or two is faulty (depending on your RAID level) is in danger of failing.

Common scenarios for critical status	<ul> <li>Unplugging disk that is part of an array</li> <li>Bad sector detected on a disk part of the array</li> <li>Unrecoverable data during rebuilding</li> <li>Defective port or cable interrupts rebuilding process</li> </ul>
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To recover from this situation,

- 1. Backup your existing data.
- 2. Identify which disk is faulty.
  - You can refer to the LED lights on the enclosure
  - Refer to the WebGUI Logical tab and Event tab.
- 3. Re-insert the faulty disk or replace with a new disk.
  - Array will rebuild automatically if your auto-rebuild setting is enabled and you reseated the faulty disk. *Note*: Click **Rescan** if array still does not rebuild automatically.
- 4. If the new disk is added and it does not automatically start rebuilding, you can manually add the disk in maintenance.
  - Log in to WebGUI
  - Click Logical Tab
  - Click **Maintenance** > **Add disk** > select the appropriate disk
- 5. Rebuild should now start.
  - If rebuild does not start, click 'Rescan' on the left hand panel.

*Note*: Rebuilding an array takes on average 2 hours per 1 Terabyte of disk capacity. The process will scan through the entire disk, even if you have very little *used* disk space.

### Rebuilding Stops Due to Bad Sectors

If rebuilding fails to complete due to bad disk sector errors (check in the Event Log), there is an option to continue rebuilding on error in HighPoint WebGUI.

- 1. Log in to WebGUI
- 2. Click **Setting** tab
- 3. Under System Setting, change Enable Continue Rebuilding on Error to Enabled

This option will enable rebuilding to ignore bad sectors and attempt to make your data accessible. It is important to backup immediately after backup is complete and replace or repair the disks with bad sectors.

# Critical array becomes disabled when you removed faulty disk

If this is the case, you may have removed the wrong disk. When you remove the wrong disk from a critical array, the array status may become disabled. Data is inaccessible for disabled arrays, follow these steps to restore the previous state.

- 1. Shut down your PC
- 2. Shut down the RS6314A Enclosure
- 3. Place all disks back to original configuration
- 4. Boot up PC

Your array should be back to Critical status. Identify the correct disk and rebuild from there.

### Handling Disabled Arrays

If two or more disks in your array go offline due to an error or physical disconnection your array will become **disabled**.

Disabled arrays are difficult to recover, so it is important to fix any critical status as soon as possible.

To recover a disabled array, using the 'Recover Tab' will yield the best results. To utilize the **Recover** tab, you will need to insert the **exact** physical drives that are listed under the *recover list*.

How to recover from a Disabled Array

- 1. Log in to WebGUI
- 2. Click **Maintenance** for the array that is disabled
- 3. Click **Recover**

Alternatively:

- 1. Log in to WebGUI
- 2. Click **Maintenance** for the array that is disabled
- 3. Click **delete**
- 4. Click **Recover** Tab
- 5. Select the RAID configuration you want to recover
- 6. Click **Recover Array**

### Your PC hangs when card is installed

The moment you power on your PC the system BIOS will load and your PC will enter POST (Power On Self Test). If you hang at this screen it may be a system resources issue.

There are two methods to fix this problem.

- 1. Update your motherboard BIOS
- 2. Update your RAID Controller BIOS

### Update your motherboard BIOS

To update your motherboard BIOS, refer to your motherboard manufacturer's user manual or website.

### Update your RocketRAID BIOS

To update RocketRAID BIOS refer to either of these sections

- Using a Bootable USB to update BIOS
- Updating the BIOS through WebGUI **Note**: Press END to bypass the RocketRAID BIOS splash screen so you can boot up windows and access WebGUI.

### Online Array Roaming

One of the features of all HighPoint RAID controllers is online array roaming. Information about the RAID configuration is stored on the physical drives. So if a card fails or you wish to switch cards, the RAID configuration data can still be read by another HighPoint card.

# <u>Help</u>

- Online Help
- Register Product

**Online Help** redirects you to additional documentation concerning the HighPoint WebGUI.

**Register Product** takes you to HighPoint's web support. On this page you can create a new customer profile where you can register your product or post an online support ticket.

# Table 4. WebGUI Icon Guide

_	Critical – missing disk
•	A disk is missing from the array bringing it to 'critical' status. The array
	is still accessible but another disk failure could result in data loss.
4	Verifying
010	The array is currently running a disk integrity check.
	n.l. 111
	Repuilding
~	added a new disk to a 'critical' state array
	Critical – robuild roquirod
0	The array has all disks, but one disk requires rebuilding
_	The array has an disks, but one disk requires rebuilding.
	Disabled
8	The icon represents a disabled array, meaning more than one disk
	failed and the array is no longer accessible
	Initializing
Ó.	The array is initializing. The two types of initialization is Foreground
	and Background. (See Initialization)
	Uninitialized
· · ·	incomplete
	Not Initialized
<b>L</b>	Disk is not initialized vet, and needs to be initialized before use
	OCE/ORLM
U#	Array is performing a OCE/ORLM operation
-	OCE/ORLM has stopped
	The array expansion process has been stopped.
	Legacy
L	An existing file system has been detected on the disk. These disk are
	classified as legacy drives.
-	Spare
G	The device is a spare drive, it will automatically replace any failed drive
	part of an array.



Normal The array status is normal

Ŵ	<b>Initializing</b> The array is initializing, either foreground or background initialization
Ŵ	Initialization Stopped The initialization has been stopped. Current status is uninitialized.
Ŵ	<b>Critical – Inconsistency</b> Data in the array is inconsistent and needs to be rebuilt.
	Critical – missing disk A disk has been removed or experienced failure, and user needs to reinsert disk or add a new disk.
Ŵ	Rebuilding The array is currently rebuilding.
Ŵ	Verifying The array is performing a data consistency check. Array status will show 'verifying'.
Ŵ	Disabled The array does not have enough disks to maintain the RAID level. A disabled array is not accessible.
Ŵ	OCE/ORLM Array is expanding its capacity or migrating to a different raid level. Status will display 'Expanding/Migrating'
Ŵ	OCE/ORLM stopped The 'Expansion/Migrating' process has been stopped. The status will display 'Need Expanding/Migrating'
1	Critical – OCE/ORLM A disk member is lost during the OCE/ORLM process.
1	Critical – OCE/ORLM - rebuild The expanding/migrating array requires a rebuild.

Туре	Description	Min. disks	Usable space	Advantage	Disadvantage	Application
JBOD	Just a bunch of disk	1	100%	Each drive can be accessed as a single volume	No fault tolerance - failure of one drive results in complete data loss	Backup
RAID 0	Disk Striping	2	100%	Offers the highest performance	No fault tolerance – failure of one drive in the array results in complete data lose	Temporary file, performance driven application.
RAID 1	Disk Mirroring	2	50%	Provides convenient low-cost data redundancy for smaller systems and servers	Useable storage space is 50% of total available capacity. Can handle 1 disk failure.	Operating system, backup, and transaction database.
RAID 10	Disk Mirroring followed by stripe	4	50%	High read performance and medium write performance with data protection for up to 2- drive failures	Useable storage capacity equals total capacity of all drives in the array minus two	Fast database and application servers which need performance and data protection
RAID 5	Disk Striping with Rotating parity	3	67-94%	High read performance, and medium write performance with data protection with a single drive failure	Not recommended for database applications that require frequent/heavy write sessions. Can handle 1 disk failure.	Data archives, and ideal for application that require data protection
RAID 6	Disk Striping with dual rotating parity	4	50-88%	High read performance, and medium write performance with data protection in case of up to two drives failure	Not recommended for applications that require frequent/heavy write sessions.	Data archives and ideal for application that requires data protection

# Table 5. RAID Level Quick Reference

# HighPoint Recommended List of Hard Drives

HighPoint maintains a list of tested hard drives suitable for RAID applications. Since not every hard drive in the market can be tested, this list is meant to be a general guideline for selecting hard drives operating in a RAID environment. Regular, desktop grade drives are highly not recommended for RAID use.

<u>http://highpoint-</u> <u>tech.com/PDF/Compatibility\_List/RocketRAID\_600\_2700\_3600\_and\_4500\_Series\_RAID\_HBA\_Hard\_Drive\_Compatibility\_List.pdf</u>

### **Contacting Technical Support**

For any help and support, submit a support ticket online at <u>http://www.highpoint-tech.com/websupport/</u>.

You may also call us during our regular business hours: Monday – Friday (Excluding Holidays), 9 AM to 6 PM Phone: (408) 240-6108