

RocketStor 6628A

User Manual

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HighPoint Technologies, Inc.

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Notice

Reasonable effort has been made to ensure that the information in this manual is accurate. HighPoint assumes no liability for technical inaccuracies, typographical, or other errors contained herein.

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)

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Product Overview

The RocketStor6628A was designed for Professional Media Applications that demand consistent high speed transfers, flexibility and uncompromised reliability. The built-in full-featured hardware RAID controller, management suite, and 8-hot swappable drive bays support both SAS and SATA hard drives or SSD's, and can be easily configured to deliver maximum performance, capacity or data security. HighPoint's unique all-in-one approach allows customers to streamline workflows by managing multiple projects from single storage environment, while simultaneously reducing overhead costs.

Kit Contents

- 1x 8-Bay Tower Enclosure
- 8x Drive Trays
- 1x Thunderbolt™ 3 40Gb/s Cable (2 Meters)
- 1x UL Power Cord
- 32x 3.5" HDD mounting screws
- 32x 2.5" SSD mounting screws
- 1x Quick Installation Guide

Before getting started, check to see if any items are missing, damaged, or incorrect. If you discover any discrepancies, please contact your reseller, or our Support Department via our [Online Web Support Portal](#)

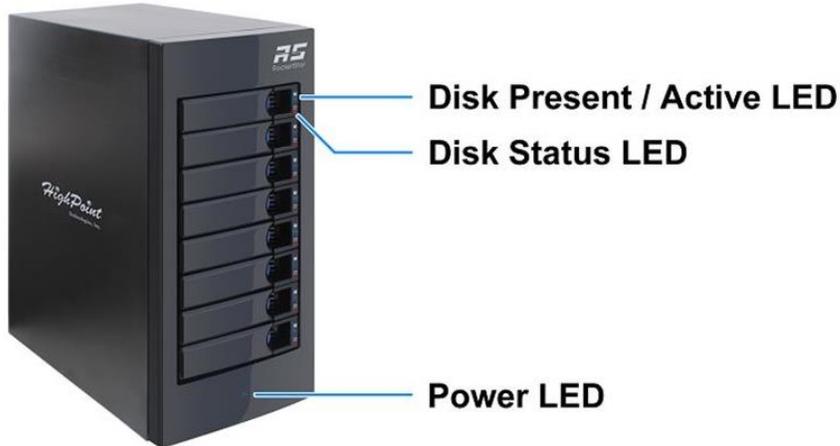
Product Information	RocketStor6628A
Port Type	Thunderbolt™ 3
Onboard Storage processor	RAID-On-Chip Onboard
Onboard Cache Memory	512MB DDR 3 Cache Memory with ECC Protection
Number of Ports	2x Thunderbolt™ 3 Ports
RAID Level	0, 1, 5, 6, 10, 50 and JBOD
System Requirements	Computer with a USB-C Port (Thunderbolt™ 3) Note: Your PC may require updates in order to ensure the Thunderbolt™ 3 ports function properly. For more information Click Here.
	Windows Server 2008 and Windows 7 and later
Max. Capacity	Unlimited
Number Of drives	Up to 8
Drive Interface	SAS, SATA
Drive Form Factor	3.5" & 2.5"
Material	Brushed aluminum housing
Dimension	13.00" (H) x 5.67" (W) x 10.12" (D)
Weight	12.9 lbs.
Warranty	3 Years
Advanced RAID Features	Configurable RAID Block Size up to 1MB
	Flash ROM for Upgradeable Firmware
	DV Mode Technology
	Storage Health Inspector
	Redundant RAID Configurations
	Multiple RAID Partitions supported
	Online Array Roaming
	Online RAID Level Migration (ORLM)
	Online Capacity Expansion (OCE)
	RAID Initialization Background/Foreground/Quick
	Global Hot Spare Disk support
	Automatic and configurable RAID Rebuilding Priority
	Auto resume incomplete rebuilding after power on or reboot system
	Disk media scan and repair
	Automatic remap and fix drive bad block for RAID array - Redundant RAID Levels (RAID 1, 5, 6, 10, 50)
	NVRAM with Write Journaling enhances RAID integrity
	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	
Write Back and Write Through	
Storage Monitoring and Management Suite	
RAID Management Suites	Browser-Based management tool,
Password Secured RAID management Suites	Yes

LED Indicator and button	HDD Power, Present, Active, Fail, Rebuilding and Identify
SMTP Email Alert Notification	Yes
Power Supply	AC INPUT: 100-240V ~ 5A 50/60Hz; DC OUTPUT: 250W
Internal Fan	80x80x25mm, Dual Fan
Alarm Buzzer	Buzzer beeping when failed drive or array occurs
Operating Environment	
Temperature	(operating) 5°C – 45°C
	(non-operating) – 40°C – 65°C"
Relative Humidity	(operating) 8% – 90% RH (Non-condensing)

Section 1: Hardware Installation

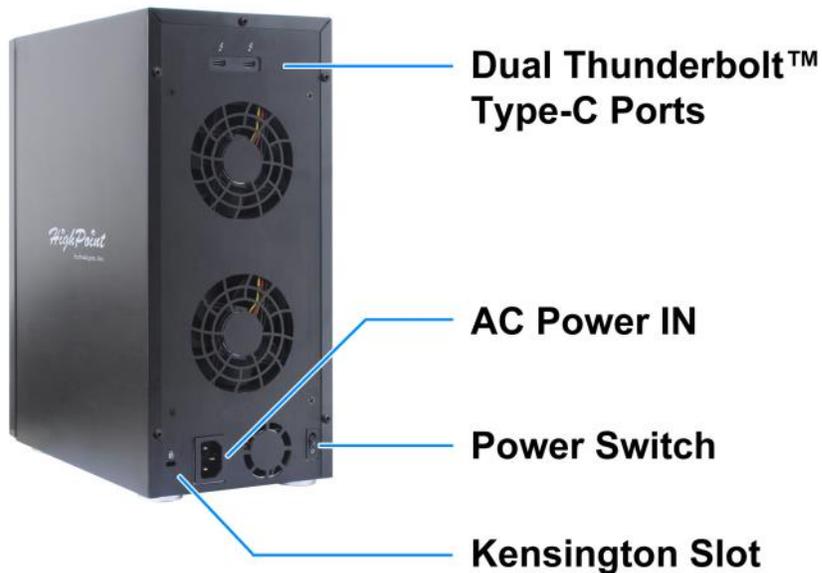
Hardware Overview

Panel Layout-Front View



Disk Present & Active LED: Solid/Flash Blue - HDD Access Indicator
Disk Status LED: Solid/Flash Red - Device Failure / Rebuilding Indicator
Power LED: Solid Blue - Power on Indicator

Panel Layout-Rear View



System Requirement

1. PC or Mac with a Thunderbolt™ Type-C Port
2. Windows 8 or later
3. Mac OS X 10.10 or later

Enclosure Setup

1. Connect the RocketStor 6628A to the host system with the Thunderbolt™ cable, and then connect the RocketStor 6628A to a power source.



2. With the power cord connected to the power source, turn on the RocketStor 6628A using the power switch on the rear panel (switch to the "I" position to power on the RocketStor 6628A).



3. RocketStor 6628A is designed to be powered on and powered off simultaneously with the host system, when the RocketStor 6628A is connected to the host system with the Thunderbolt™ cable. Therefore, power on the host system first - the RocketStor 6628A will automatically power on.

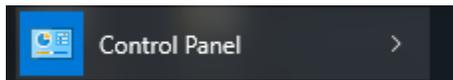


Section 2: Setting up the software for Windows Platforms

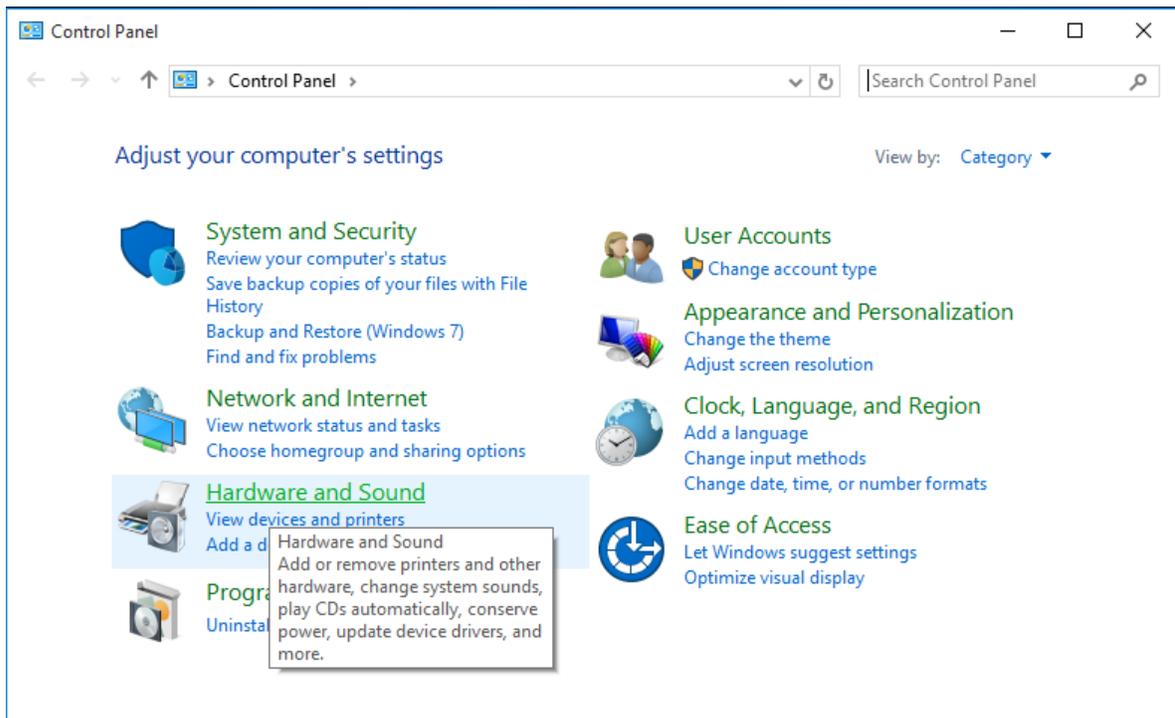
Driver Installation

Drivers provide a way for your operating system to communicate with your new hardware. Updating to the latest available driver ensures your product benefits from the most recent performance, stability, and compatibility improvements. Drivers are updated regularly at www.highpoint-tech.com

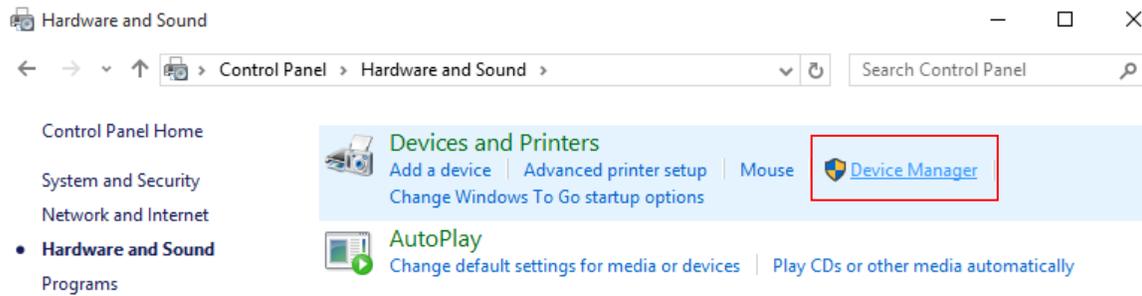
1. Obtain the latest driver software for the RocketStor 6628A from our website: http://highpoint-tech.com/USA_new/series-rs6628a-download.htm
2. Take note of the location you downloaded the driver file to and open Windows **Device Manager**.
3. Click **Start**
4. Click the search field and type **Control Panel**.



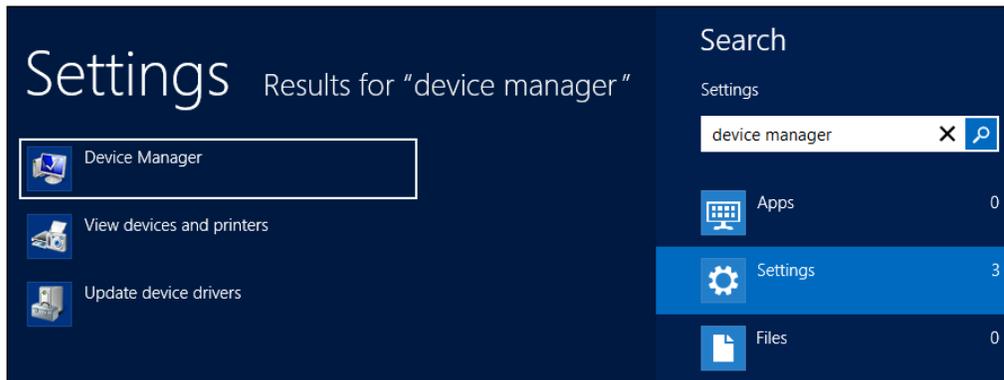
5. Click **Hardware and Sound**



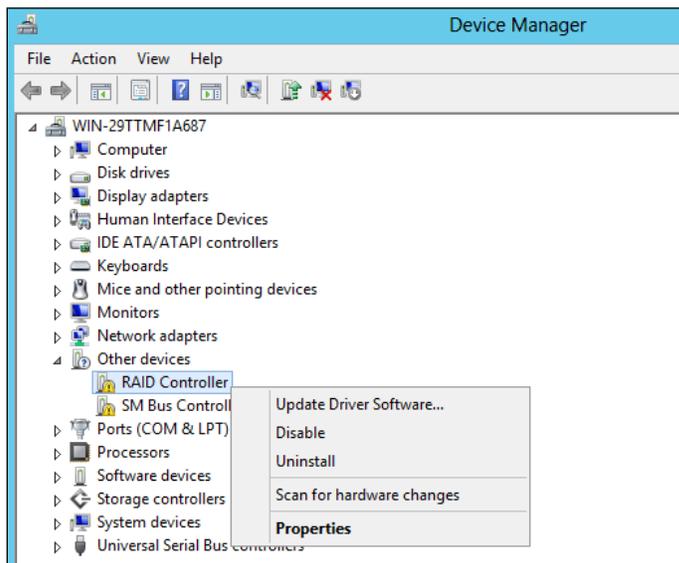
6. To the right of **Devices and Printers**, Click **Device Manager**:



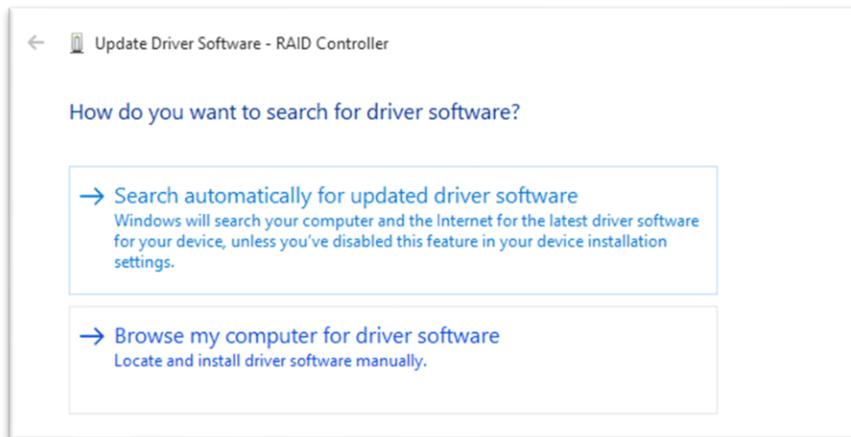
7. **Note:** Alternatively, you can search for **Device Manager** in your start menu search bar.



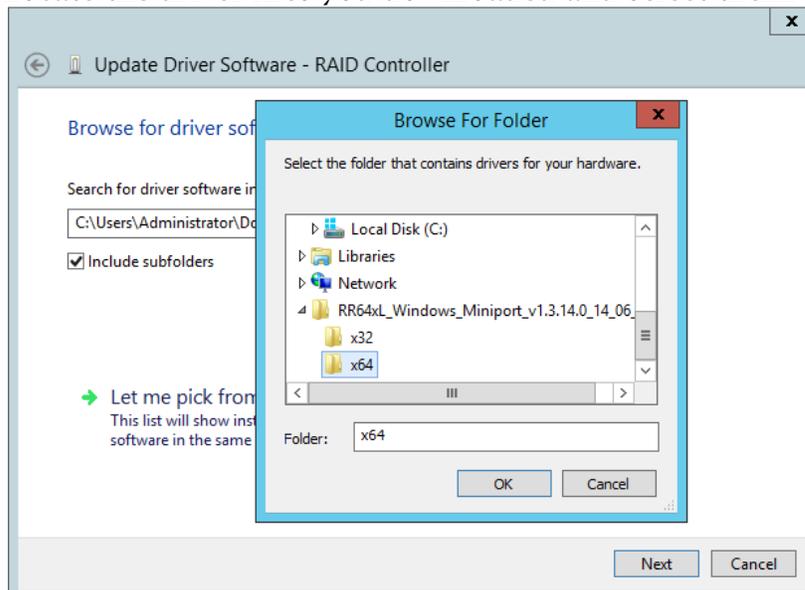
8. Under **Other Devices**, right click on **RAID controller** and click **Update Driver Software**:



9. When prompted, select **Browse my computer for driver software**.



10. Locate the driver files you downloaded and select them.



11. Press **next** and follow the on-screen instructions.

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.

1. Click **Start**
2. Click **Control Panel**
3. Click **Hardware and Sound**
4. To the right of **Devices and Printers**, Click **Device Manager**
5. **Note:** Alternatively, you can search Device Manager using your start menu search bar.
6. Click the **Storage controllers** tab:



- If the driver is installed, it will show **RocketRAID 4520 Controller**.
- If the driver is *not* installed, it will be located in **Other devices** as a **RAID Controller**
- Click **Properties**, then click the **Driver** Tab to check the version:

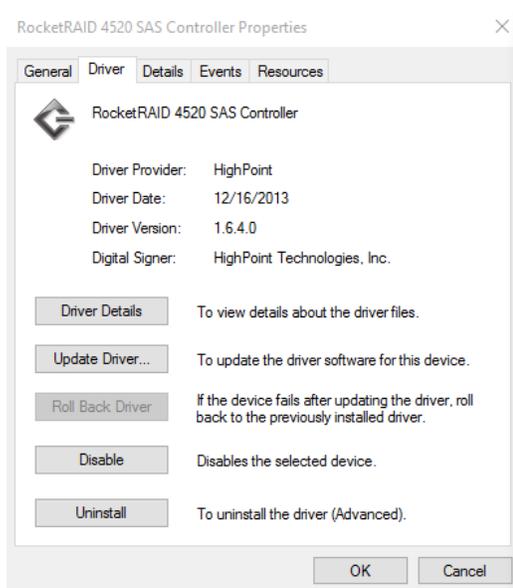
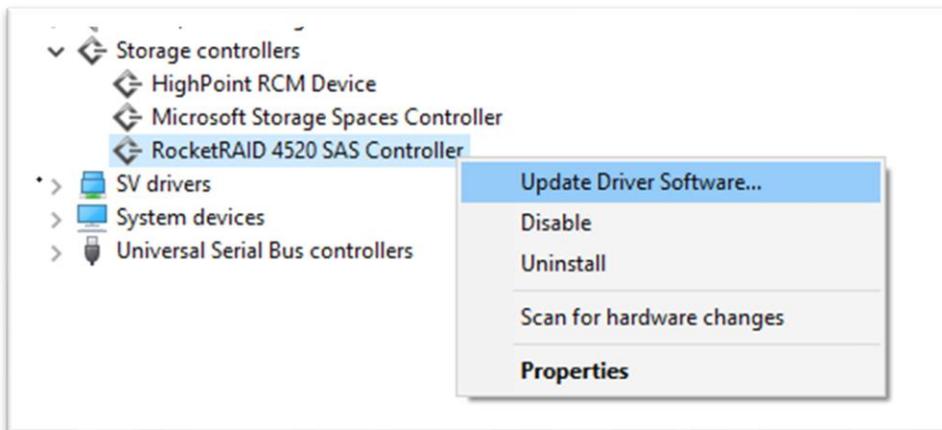


Figure 1.Driver version 1.6.4.0 for a RocketRAID 4520

Updating the Drivers

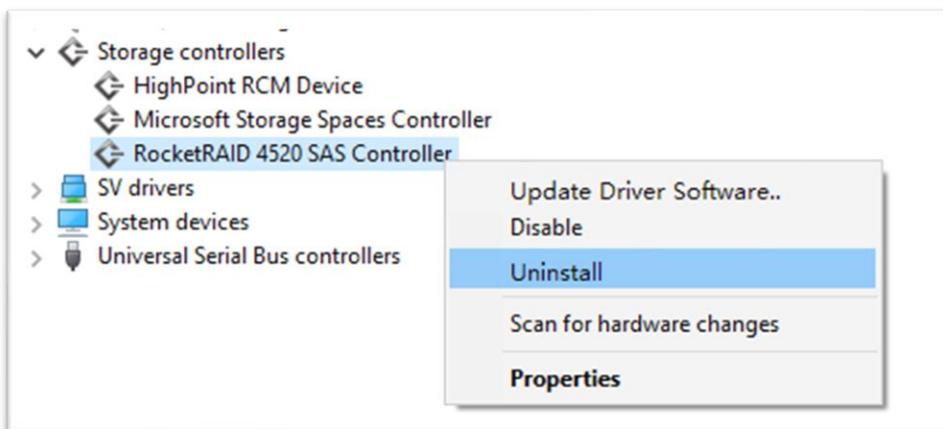
1. Obtain the latest driver files for the **RocketStor 6628A** from http://highpoint-tech.com/USA_new/series-rs6628A-download.htm
2. Open Windows **Device Manager**
3. Click **Start**
4. Click **Control Panel**
5. Click **Hardware and Sound**
6. Under **Devices and Printers**, Click **Device Manager**
7. **Note:** Alternatively, you can search Device Manager in your start menu search bar.
8. Click the **Storage controllers** tab
9. Right click **RocketRAID 4520 Controller**



10. Click Update Driver Software
11. Click Browse my computer for driver software
12. Select the driver files you downloaded
13. Click next
14. Reboot

Uninstalling the Drivers

1. Open Windows **Device Manager**
 - Click **Start**
 - Click **Control Panel**
 - Click **Hardware and sound**
 - Under **Devices and Printers**, 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 4520 SAS Controller**



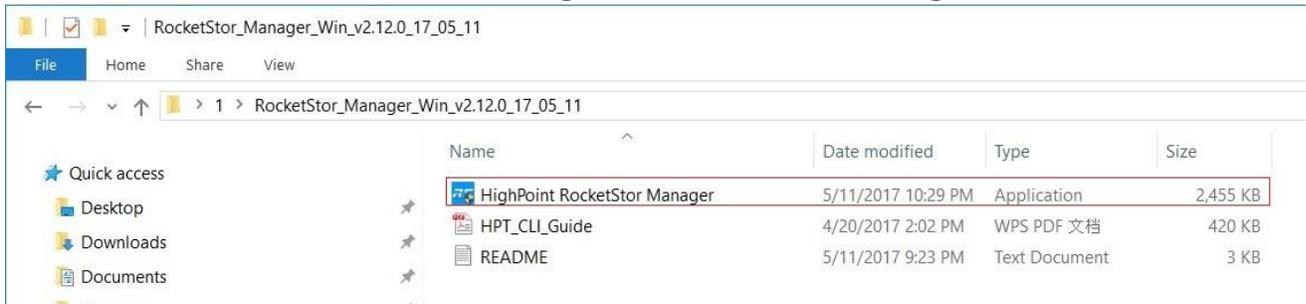
4. Click **Uninstall**
5. **Reboot** your PC to allow the changes to take effect

Installing the HighPoint RocketStor RAID Manager

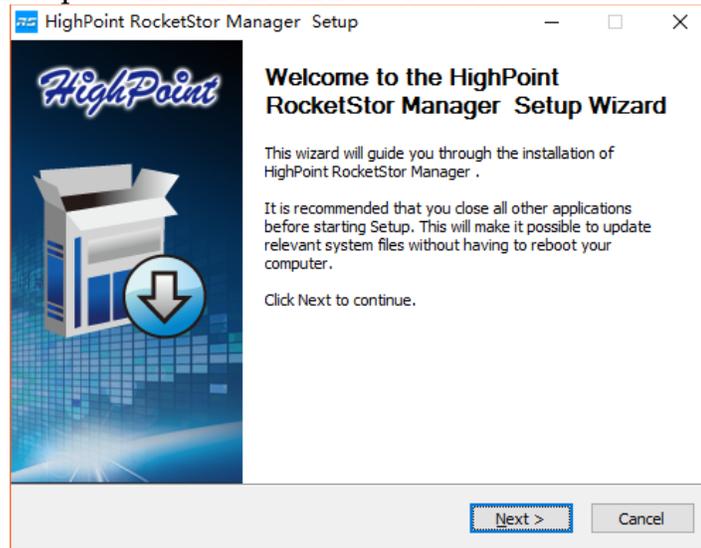
The HighPoint RocketStor Manager (HRM) is the primary link between you and your RAID array. Using the management utilities and menus offered by the HRM, you would be able to access, create, and maintain your RAID arrays.

New features are continually added to the interface; update to the latest version at http://highpoint-tech.com/USA_new/series-rs6628A-download.htm

1. Locate the HRM Setup on our website and download the HRM package. Extract the contents and double click on **HighPoint RocketStor Manager.exe**



Follow the on-screen steps to install the **HRM** software.



2. Log into the HRM by double clicking the desktop icon, or by typing <http://localhost:7404> in your preferred web browsers address line (we recommended using the latest version of the browser.)



How to Login to the HRM

You can reach the HRM log in page either by:

- Double clicking on the **HighPoint RocketStor RAID Manager** icon created on your desktop
- Opening your preferred web browser and typing <http://localhost:7404> in the address bar.

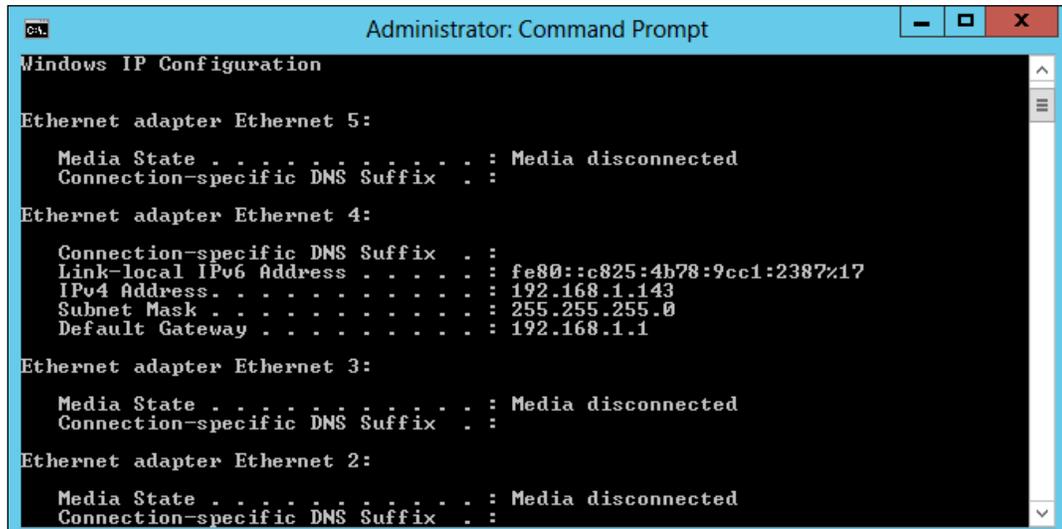
Note: It can set the password under the **Setting** tab.

Remote Login

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

To obtain your IP address

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 2. 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 HRM **Setting** (Refer to **The HRM, Setting** tab).

You can then remotely access the HRM using any other computer that is in your local network by opening any web browser and typing `http://{IP address of host computer}:7404` (default port is 7404)

Formatting the RAID Volumes

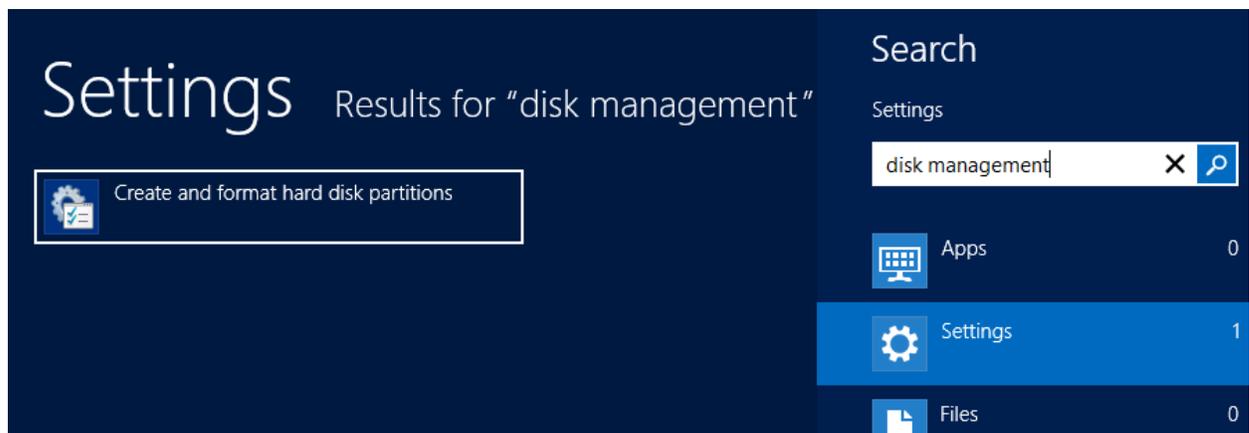
After creating a RAID array, your operating system will recognize that array as a logical disk. However, the array will not be accessible until it is formatted by the operating system.

Format the volume when you have finished the following procedures:

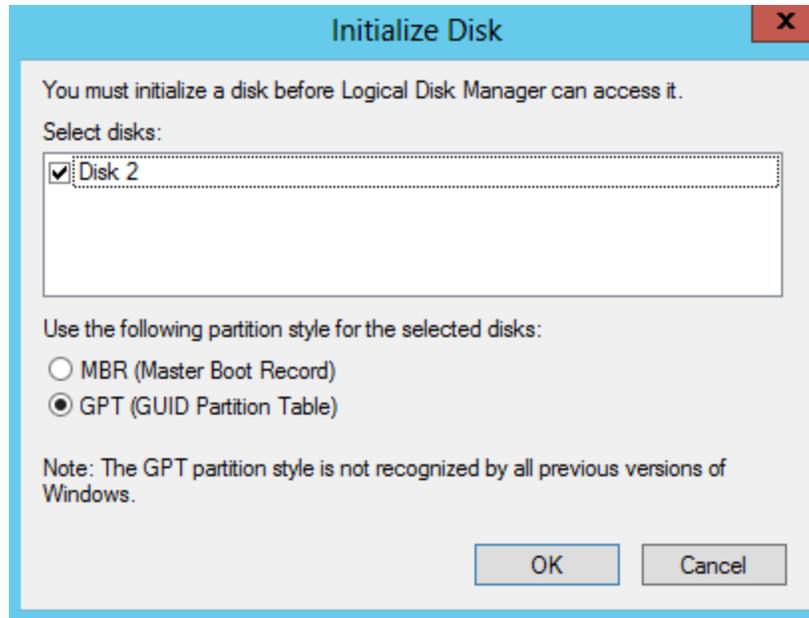
- Set up the Enclosure
- Set up the RAID Controller
- Installed Drivers
- Created an Array

For **Windows** Users:

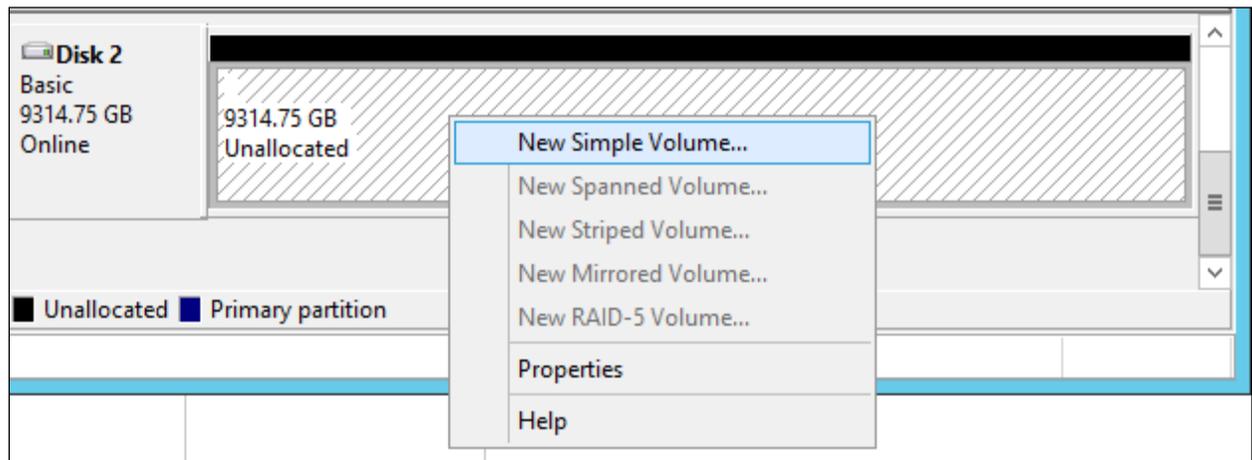
1. Use the Windows Search function and search for **Disk Management**. (Search results may show **Create and format hard disk partitions**)



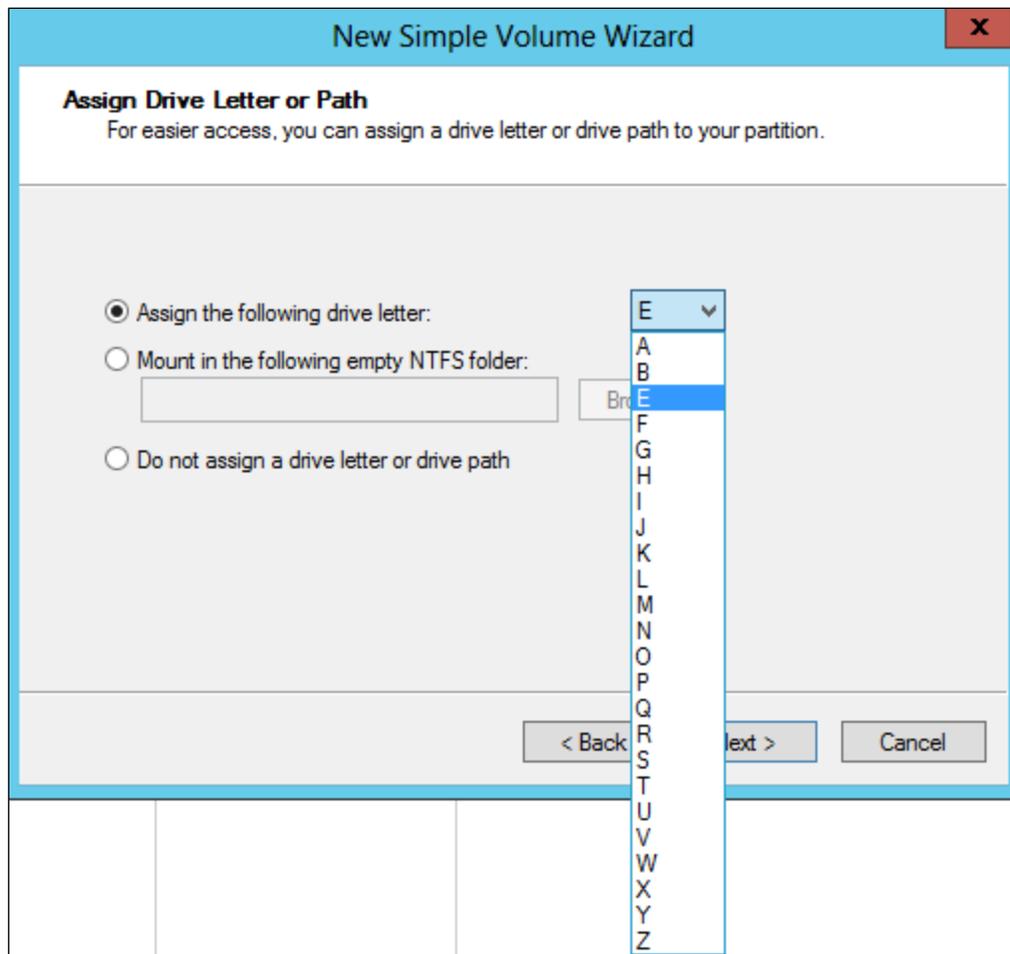
2. Alternatively, Go to **Control Panel**
3. Under Administrative Tools, click **Create and format hard disk partitions**
 - If you just created the array, a prompt will appear after clicking disk management asking you to initialize the disk
 - MBR partition table is mainly for bootable drives and has 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.



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



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



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

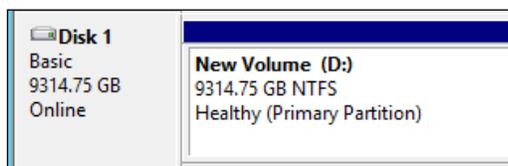
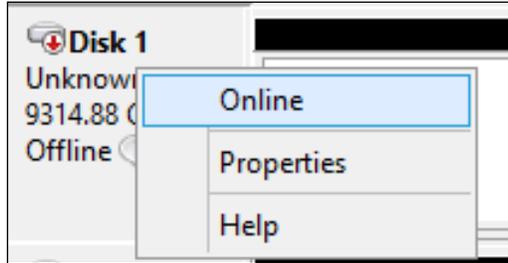


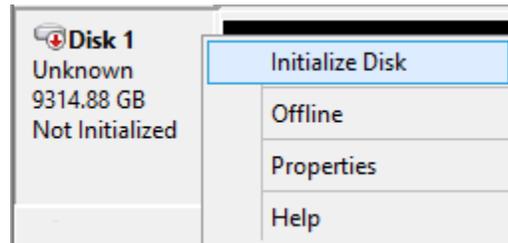
Figure 3. Disk formatted as NTFS and assigned drive letter D:

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.



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

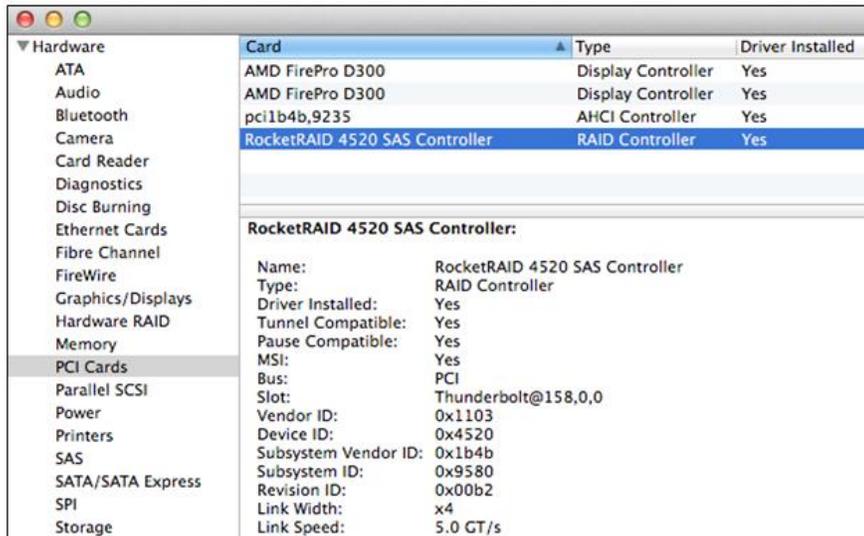


Section 3: Setting up the software for Mac Platforms

1. Verify the RocketStor6628A's RAID Controller driver.

Log-in to Mac OS X

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



Check to make sure the “Driver Installed” status for the RocketRAID 4520 SAS Controller is “Yes”.

2. Install the HighPoint RocketStor RAID Manager (HRM) software.

- 1) Download the HRM from HighPoint Website:

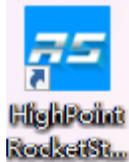
http://highpoint-tech.com/USA_new/series-rs6628A-download.htm

- 1) Extract the package and double Click the Installation program to start installing the HRM.

- 2) Follow the on-screen instructions to complete the installation procedure.

3. Running the HRM

- 1) After installation is complete, a HRM icon will be displayed on the desktop.



- 2) Double-click this icon to open the HRM.

Warning: Using the HRM to create RAID arrays will destroy all pre-existing data on the selected disks. Make sure to backup any important data before using these disks to create arrays.

4. After the new RAID volume has been configured, OS X will display a pop-up window.



Click the Initialize button to start Disk Utility. Select **Erase** to format the RAID volume. After formatting, the RAID volume is ready for use.

Select the RAID volume that has been built, and select Erase on top, name the RAID volume in the center part, and then select Erase on bottom right of the pane to format the RAID volume.

5. After formatting, the RAID volume is ready for use.



Section 4: Using the HighPoint RocketStor RAID Manager (HRM)

How to Login to the HRM

You can reach the HRM log in page either by:

- Double clicking on the **HighPoint RocketStor RAID Manager** icon created on your desktop
- Opening your preferred web browser and typing <http://localhost:7404> in the address bar.

There is no password needed for the default log-in. The password can be changed under the **Setting** tab after log-in the HRM.

Navigating the HRM

The HRM 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
Over View	View Enclosure and Storage Properties
Quick Config	A quick configuration wizard to create a new RAID array.
Advanced Config.	Manage and create RAID arrays
Settings	Adjust HRM controls settings
Event	Show HRM Event Log
SHI (Storage Health Inspector)	View and schedule S.M.A.R.T monitoring
Help	Online help, Register Product, Configuration Record

Overview Tab

The screenshot displays the 'Overview' tab of the HighPoint HRM interface. At the top, there is a navigation bar with tabs: Overview (selected), Quick Config., Advanced Config., Settings, Event, SHI, and Help. Below this, the interface is split into two main sections: 'Enclosure Properties' and 'Storage Properties'.

Enclosure Properties: This section features a 3D image of a RocketStor 6628A enclosure. Below the image, the following details are listed: Model: RocketStor 6628A, Firmware: v1.8.15.0, and Disk installed: 8. A blue 'Detail' link is positioned to the right of the disk count.

Storage Properties: This section provides storage metrics and a capacity visualization. The metrics are: Total: 9.60 TB, Configured: 4.80 TB, Free: 4.80 TB, RAID Array: 1, Logical Device: 1, and Background Task: 0. A blue link for 'Advanced Config.' is located below these metrics. To the right, a pie chart shows the capacity usage: 49% (dark blue) for Configured Capacity and 51% (light grey) for Free Capacity. A legend below the chart identifies the colors.

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

- Enclosure 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).

Enclosure Properties

1. Log into the HRM
2. Select the proper controller from drop down menu on the top left
3. Click **Overview**

Enclosure Properties

- **Model:** the model name of the controller
- **Disk installed:** number of drives seen by the controller

Viewing Storage Properties

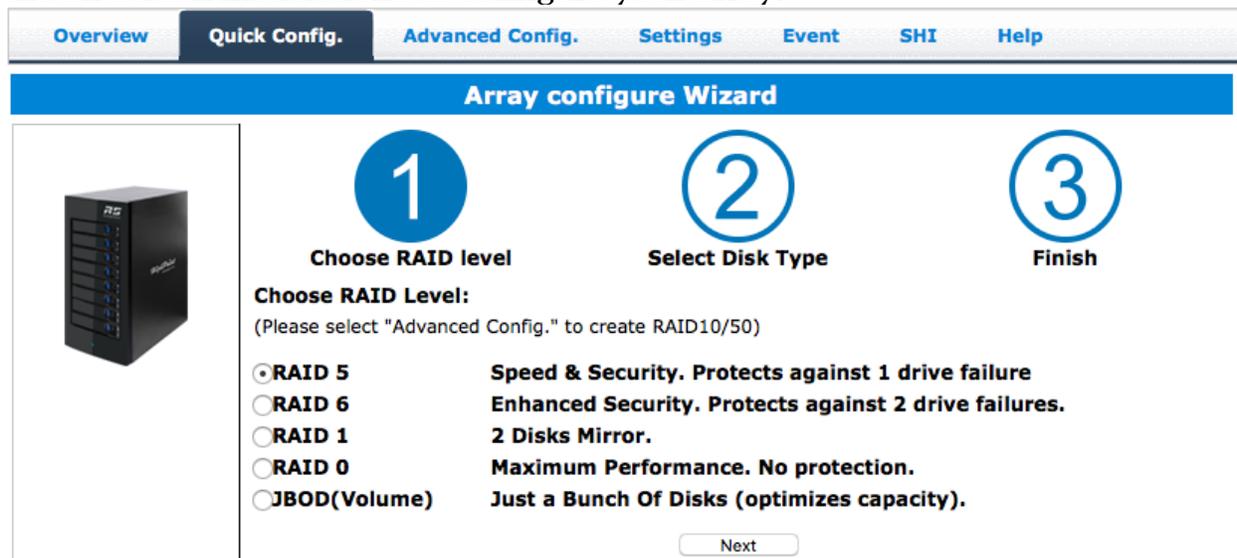
1. Log into the HRM
2. Select the controller from drop down menu on the top left
3. Click **Overview**

Storage Properties

- **Total:** the combined capacity of each physical disk connected to the controller.
- **Configured:** the amount of space used for creating arrays
- **Free:** total amount of unused space
- **RAID Array:** total amount of the configured RAID array.
- **Logical Device:** total amount of logical device.
- **Background Task:** current running task.

Quick Config.

Quick Config is the easiest and quickest way to configure RAID arrays. Follow the on-screen instructions to configure your array.



The screenshot displays the 'Array configure Wizard' interface. At the top, there is a navigation bar with tabs: Overview, Quick Config. (selected), Advanced Config., Settings, Event, SHI, and Help. Below the navigation bar is a blue header with the text 'Array configure Wizard'. The main content area is divided into three steps, each with a large circled number: 1. Choose RAID level, 2. Select Disk Type, and 3. Finish. On the left side of the wizard, there is an image of a server rack. The 'Choose RAID level' step is currently active, showing a list of RAID options with radio buttons: RAID 5 (selected), RAID 6, RAID 1, RAID 0, and JBOD(Volume). To the right of the list, there are descriptions for each option: RAID 5: 'Speed & Security. Protects against 1 drive failure'; RAID 6: 'Enhanced Security. Protects against 2 drive failures. 2 Disks Mirror.'; RAID 0: 'Maximum Performance. No protection.'; JBOD(Volume): 'Just a Bunch Of Disks (optimizes capacity)'. At the bottom of the wizard, there is a 'Next' button.

Advanced Config.

1. Log into the HRM
2. Click **Advanced Config.**

Logical Device Information						
Name	Type	Capacity	BlockSize	SectorSize	OS Name	Status
RAID_5_0	RAID 5	21.00 TB	128k	512B	HPT DISK 1_0	Normal Maintenance

Physical Device Information			
Location	Model	Capacity	Max Free
1/1	ST4000NE0025-2EW107-ZC12KLBT	4.00 TB	1.00 TB
	Revision: EN02	Read Ahead: Enabled	Change
	Location: 1/1	Write Cache: Enabled	Change
	Max Free: 1.00 TB	NCQ: Enabled	Change
	Status: Normal	Identify LED: [ON] [OFF]	
	Serial Num: ZC12KLBT		
1/2	ST4000NE0025-2EW107-ZC12JBHF	4.00 TB	1.00 TB
1/3	ST4000NE0025-2EW107-ZC12G5J8	4.00 TB	1.00 TB
1/4	ST4000NE0025-2EW107-ZC12HGNE	4.00 TB	1.00 TB
1/5	ST3000VX000-9YW166-S1F0S0W3	3.00 TB	0.00 GB
1/6	ST4000VX007-2DT166-WDH2VYMQ	4.00 TB	1.00 TB
1/7	ST4000VX007-2DT166-WDH2VYQM	4.00 TB	1.00 TB
1/8	ST4000VX007-2DT166-WDH2VYMA	4.00 TB	1.00 TB

The Advanced Config. tab is where you can edit, delete, and maintain your RAID configurations, as well as review the Physical Device information. The Advanced Config. tab has the following functions:

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

Creating Array

To create an array:

1. Click **Advanced Config.**
2. Click **Create Array**

An array is a collection of physical disks that will be seen as one virtual drive by your Operating System (OS).

Create Array

Array Type: RAID 5

Array Name: Default

Initialization Method: Quick Init

Cache Policy: Write Back

Block Size: 128K

Number of RAID5 member disks: 3

Select All

	Location	Model	Capacity	Max Free
<input checked="" type="checkbox"/>	1/1	ST4000NE0025-2EW107-ZC12KLBT	4.00 TB	4.00 TB
<input checked="" type="checkbox"/>	1/2	ST4000NE0025-2EW107-ZC12JBHF	4.00 TB	4.00 TB
<input checked="" type="checkbox"/>	1/3	ST4000NE0025-2EW107-ZC12G5J8	4.00 TB	4.00 TB
<input checked="" type="checkbox"/>	1/4	ST4000NE0025-2EW107-ZC12HGNE	4.00 TB	4.00 TB
<input checked="" type="checkbox"/>	1/5	ST3000VX000-9YW166-S1F0S0W3	3.00 TB	3.00 TB
<input checked="" type="checkbox"/>	1/6	ST4000VX007-2DT166-WDH2VYMQ	4.00 TB	4.00 TB
<input checked="" type="checkbox"/>	1/7	ST4000VX007-2DT166-WDH2VYQM	4.00 TB	4.00 TB
<input checked="" type="checkbox"/>	1/8	ST4000VX007-2DT166-WDH2VYMA	4.00 TB	4.00 TB

Available Disks:

Capacity: (According to the max free space on the selected disks) Maximum (MB)

Sector Size: 512B

Create

Array Type:

- JBOD - Just a Bunch of Disks
- RAID 0 - Striping
- RAID 1 - Mirroring
- RAID 5 - Rotating Parity bit (Single parity)
- RAID 6 - Rotating Parity bit (Dual parity)
- RAID 10 - Striping Mirrored array
- RAID 50 - Striping RAID 5 array

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 as previous data physically stored on the drive may interfere with new data.

Note: If you are creating an array with new disks, use the Quick Init option. New hard drives are already “zeroed” out by the manufacture before sale, and do not require initialization.

- **Keep Old Data:** This option will skip the initialization process and all data on each physical disk of the array will be untouched. The Keep Old Data option is always used to rescue an old RAID configuration, such as an unexpected RAID lost or wrong delete Array operation or.
- **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 as 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 is not accessible, but the initialization process will complete much faster.
- **Background:** The array initialization process will have a lower priority. During this time the array will be accessible, but the initialization process will take much longer to complete.

Note1: Initializing takes a significant amount of time (approximately 2 hours per one 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.

Block Size (default: 64K)

Adjusting the block size towards your disk usage can result in some performance gain.

In a typical RAID configuration, data of the virtual drive is striped (or spread across) the physical drives. Having a smaller array block size will increase the likelihood of accessing all physical drives when processing large I/O requests. Multiple physical drives working in parallel increases the throughput, meaning better performance.

For smaller I/O requests (512 bytes to 4 kilobytes), it is better to have each individual disks handle their own I/O request, improving the IOPS (I/O per second), rather than having one tiny I/O request being handled by multiple disks.

A block size of 64k is recommended because it strikes a balance between the two I/O usage scenarios.

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.
- The first drive is 6 TB, the second is 4 TB, and the 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 of 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 utilize. You can use the remaining space to create another array (up to 4 arrays are supported).

[Adding Spare Disks](#)

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

To add spare disks:

1. Click **Advanced Config**.
2. Click **Spare Pool**:

Overview Quick Config. **Advanced Config.** Settings Event SHI Help

Create Array
 Spare Pool
 Logical Device
 Rescan
 Beeper Mute

Spare Pool

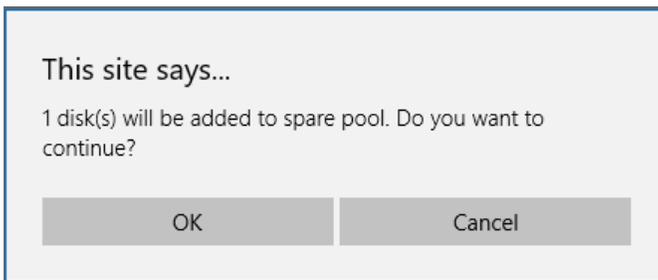
Remove Spare

Available Disks

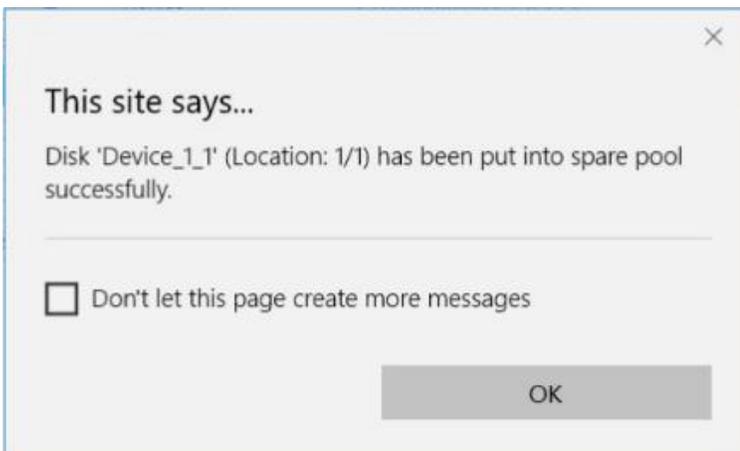
<input checked="" type="checkbox"/>		Device_1_1	ST4000NE0025-2EW107-ZC12KLBT	4.00 TB
<input type="checkbox"/>		Device_1_2	ST4000NE0025-2EW107-ZC12JBHF	4.00 TB
<input type="checkbox"/>		Device_1_3	ST4000NE0025-2EW107-ZC12G5J8	4.00 TB
<input type="checkbox"/>		Device_1_4	ST4000NE0025-2EW107-ZC12HGNE	4.00 TB
<input type="checkbox"/>		Device_1_5	ST3000VX000-9YW166-S1F0S0W3	3.00 TB
<input type="checkbox"/>		Device_1_6	ST4000VX007-2DT166-WDH2VYMQ	4.00 TB
<input type="checkbox"/>		Device_1_7	ST4000VX007-2DT166-WDH2VYQM	4.00 TB
<input type="checkbox"/>		Device_1_8	ST4000VX007-2DT166-WDH2VYMA	4.00 TB

Add Spare

3. Check the box for the disk you want as a spare under **Available Disks**.
4. Click **Add Spare**, and confirm by selecting **OK** from the pop-up window:



5. The disk has now been assigned as a spare. Click **OK** to confirm:



Disks added to the spare pool will be displayed under **Spare Pool** and can be removed by checking the box before the target drive, then clicking the **Remove Spare** button.

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

Obtaining Logical Device Information

The Logical device including your RAID arrays and the 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, the Maintenance menu provides options to maintain or edit it. To access the Maintenance menu, click the **Maintenance** button towards the right-hand side of the array name.

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.

Array Information & Maintenance Options: Normal Status

The screenshot displays the 'Advanced Config.' tab of a RAID management tool. The main section is titled 'Logical Device Information' and shows a table with columns: Name, Type, Capacity, BlockSize, SectorSize, OS Name, and Status. The entry 'RAID_5_0' is highlighted, with a status of 'Normal' and a 'Maintenance' link. A sidebar on the left contains options like 'Create Array', 'Spare Pool', 'Logical Device', 'Rescan', and 'Beeper Mute'. An 'Array Information' dialog box is open over the RAID_5_0 entry, showing a tree view of devices (Device_1_1 to Device_1_8) with various maintenance options: Delete, Unplug, Verify, Write Back, Change Cache Policy, Rename, JBOD(Volume), and ORLM. A 'Close' button is visible at the bottom right of the dialog.

Arrays with the **Normal** status are healthy and functioning properly. Arrays with the **Normal** status will have the following options:

Delete - deletes the selected RAID array

Unplug - powers off the selected RAID array - once powered off, the physical disks can be safely removed from the RAID controller

Verify - verifies the integrity of the RAID array

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

Rename - renames the RAID array.

ORLM (Online Capacity Expansion / Online RAID Level Migration options)-See **Expanding a RAID array** for more information.

Array Information & Maintenance Options: Critical Status

The screenshot displays the 'Advanced Config' tab of a storage management interface. The main section is titled 'Logical Device Information' and shows a table with columns: Name, Type, Capacity, BlockSize, SectorSize, OS Name, and Status. The entry 'RAID_5_0' is highlighted, with a status of 'Critical' and a link to 'Maintenance'. An 'Array Information' dialog box is open, showing a tree view of devices (Device_1_1 to Device_1_8) and a context menu with options: Delete, Unplug, Add Disk, Write Back, Change Cache Policy, JBOD(Volume), and ORLM. A 'Close' button is visible at the bottom right of the dialog.

Arrays in the **Critical** status can be accessed and utilized, but are no longer fault tolerant. A Critical array should be rebuilt as soon as possible to restore redundancy. 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 the 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 the 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.

If a spare disk is available, an array that has entered the critical state will begin rebuilding using the next available spare disk.

Array Information & Maintenance Options: Disabled Status

Name	Type	Capacity	BlockSize	SectorSize	OS Name	Status
RAID_5_0	RAID 5	21.00 TB	128k	512B		Disabled Maintenance

Location	Model	Capacity	Max Free
1/1	ST4000NE0025-	4.00 TB	1.00 TB
1/2	ST4000NE0025-	4.00 TB	1.00 TB
1/3	ST4000NE0025-	4.00 TB	1.00 TB
1/4	ST4000NE0025-	4.00 TB	1.00 TB
1/5	ST3000VX000-9	3.00 TB	0.00 GB
1/6	ST4000VX007-2	4.00 TB	1.00 TB
1/7	ST4000VX007-2	4.00 TB	1.00 TB
1/8	ST4000VX007-2DT166-WDH2VYMA	4.00 TB	1.00 TB

An array with the **Disabled** status means that the RAID level does not have enough disks to function.

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

Your options in Maintenance are:

- Delete
- Unplug
- Verify

Delete - will delete the array

Unplug - will take the array offline, making it safe to remove

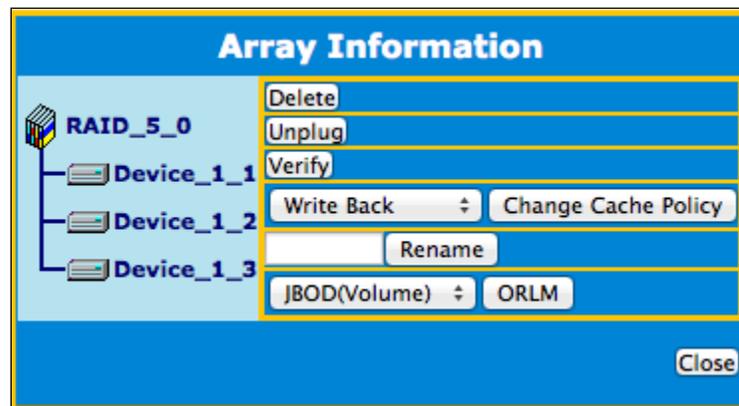
Verify - will attempt to verify the RAID array integrity, only the RAID1, 5 and 10 support this feature.

Expanding an Existing Array

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

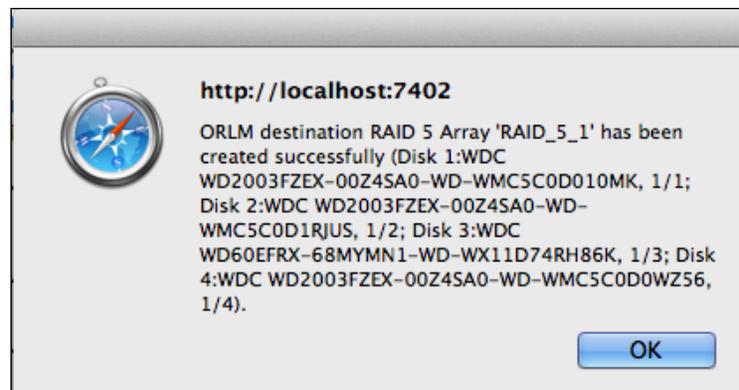
To add more capacity to your current configuration follows these steps:

1. Click **Advanced Config**.
2. Click **Maintenance** for the array you want to change
 - Select a **different** RAID level to **Migrate**. For example, if you want to change a RAID 0 array, you will need to select a different RAID level, such as RAID 5 or 6.
 - Select the **same** RAID level to **Expand**. For example, if you want to expand the capacity of an existing RAID 5 array, you must select RAID 5 from the menu.



3. **Important:** make a note of all the physical drives currently in the target array.
4. Click **ORLM**
5. Select the physical drives you recorded earlier (step 5) and the drives you want to add
6. Click **Submit**

Upon submission, you will receive a prompt stating ORLM has been successfully configured.



The **Logical Device Information** will change the status to **migrating**.

The screenshot shows the RAID controller's 'Advanced Config.' tab. The 'Logical Device Information' table lists two RAID devices:

Name	Type	Capacity	BlockSize	SectorSize	OS Name	Status
RAID_5_0	RAID 5	12.00 TB	128k	512B	HPT DISK 1_0	Migrating 0% Maintenance
RAID_5_1	RAID 5	12.00 TB	128k	512B	HPT DISK 1_0	Migrating 0% Maintenance

The 'Array Information' dialog box shows the following structure:

- RAID_5_0
 - Device_1_1
 - Device_1_2
 - Device_1_3
 - Device_1_4
- Transform Target:
 - RAID_5_1
 - Device_1_1
 - Device_1_2
 - Device_1_3
 - Device_1_4
 - Device_1_5

The 'Stop' button is highlighted in the dialog.

Physical Device Information

- **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

The screenshot shows the RAID controller's 'Advanced Config.' tab. The 'Physical Device Information' table lists two physical devices:

Location	Model	Capacity	Max Free
1/1	ST4000NE0025-2EW107-ZC12KLBT	4.00 TB	1.00 TB
1/2	ST4000NE0025-2EW107-ZC12JBHF	4.00 TB	1.00 TB

Additional details for device 1/1:

- Revision: EN02
- Location: 1/1
- Max Free: 1.00 TB
- Status: Normal
- Serial Num: ZC12KLBT
- Read Ahead: Enabled [Change](#)
- Write Cache: Enabled [Change](#)
- NCQ: Enabled [Change](#)
- Identify LED: [\[ON\]](#) [\[OFF\]](#)

Rescan

Clicking rescan will force the drivers to report the 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 enters a **critical** status
- An array enters **disabled** status
- You unplug a disk
- Your disk fails due to bad sectors
- SMART sensors anticipate drive failure

If the 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**. See Setting Tab for more information.

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, channel 2)
- **Write Cache*** - (Enable/Disable) the disk write cache
- **Max Free** - space on the disk that is not configured in an array
- **Status** - (Normal, disabled, critical) status of the disk
- **Serial Number** - serial number of the physical disk
- **Unplug** - Safely ejects the selected disk. Other methods of disk removal will trigger the 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.

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.

Settings Tab

Using this tab, you can change the following:

- Enclosure
- Email Notification
- Security
- System setting

Enclosure: Review the enclosure information or update the BIOS/Firmware.

The screenshot shows the 'Settings' tab in the Enclosure configuration interface. The 'Enclosure Info' section displays the following details:

Controller Name:	RocketStor 6628A
SASAddress:	500193c011030000
EFI Version:	v1.3
Firmware Version:	v1.8.15.0

Below the table, there is a section for updating the firmware:

Select the blf file to update Firmware.

Choose File no file selected Submit

Email Notification: Setting up the event notification via SMTP Email server.

The screenshot shows the 'SMTP Setting' and 'Recipients' configuration pages. The 'SMTP Setting' section includes the following options:

- Enable Event Notification
- Server Address (name or IP): [Text Input]
- Mail From (E-mail address): [Text Input]
- Login Name: [Text Input]
- Password: [Text Input]
- SMTP Port: [Text Input] (value: 25)
- Support SSL:

A 'Change Setting' button is located below the SMTP settings.

The 'Recipients' section features a table with columns for 'E-mail', 'Name', and 'Event Level'. Below the table is an 'Add Recipient' section with the following fields:

- E-mail: [Text Input]
- Name: [Text Input]
- Event Level: Information Warning Error

An 'Add|Test' button is located at the bottom of the 'Add Recipient' section.

The following topics are covered under email:

- SMTP Setting
- Adding Recipients

You can instruct the controller to send an email out to the recipients of your choosing when certain events trigger (for more information, see Event Tab).

SMTP settings

SMTP Setting

Enable Event Notification

Server Address (name or IP):

Mail From (E-mail address):

Login Name:

Password:

SMTP Port:

Support SSL:

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
--------	------	-------------

Add Recipient

E-mail:

Name:

Event Level: 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 using the respective **Event Level** check boxes.
4. **(Optional)** Click **test** to confirm the 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 include the output recorded in the event log.
Example email message:

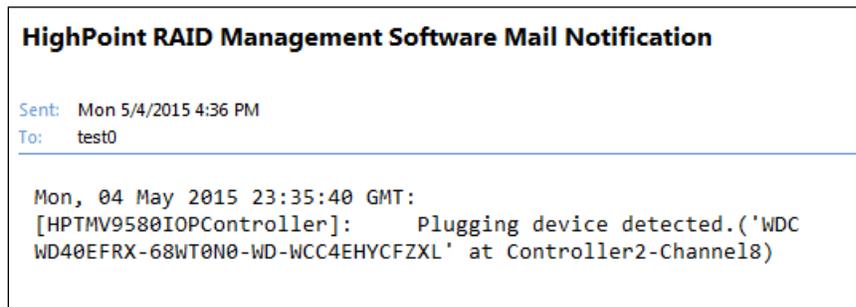


Figure 1. Example event log email

Security: Setting the HRM's log in password, remote log in availability and the port number.

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 HRM.

Port Number (default: 7404)

The default port that the HRM listens on is 7404. You may change it to any open port.

Password Settings

Changing your HRM password

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

Recovering your HRM password

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

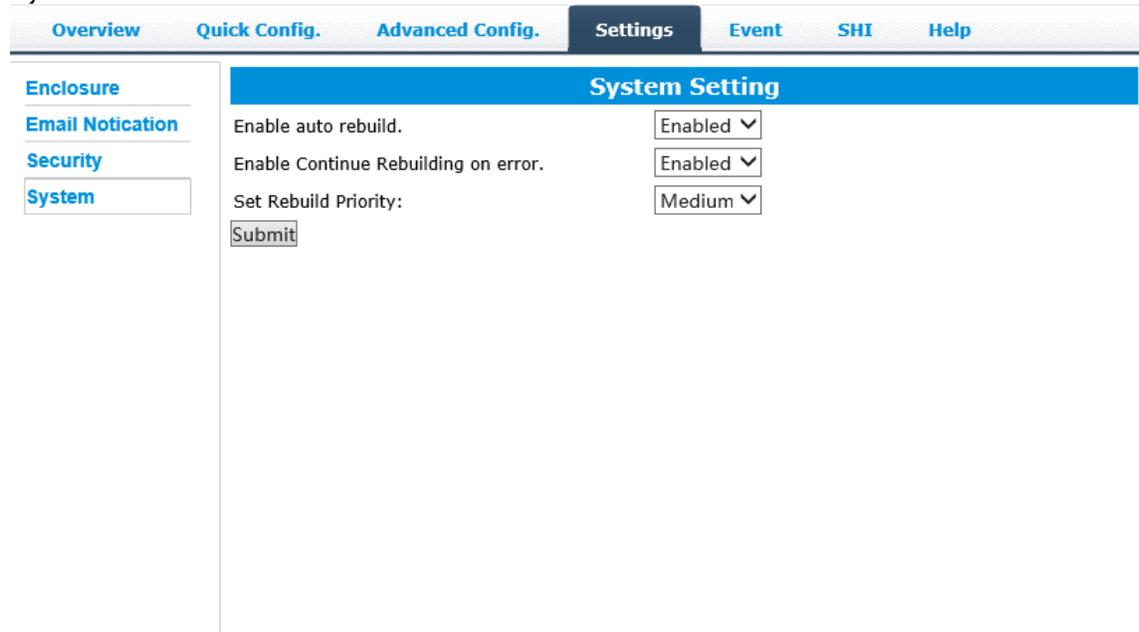
For **Mac** Users:

1. We recommend uninstalling HRM, then reinstalling -this will remove the password requirement and allow you create a new one under the **Setting** tab.

For **Windows** Users:

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

System Tab:



The screenshot shows a web-based management interface with a navigation menu at the top containing 'Overview', 'Quick Config.', 'Advanced Config.', 'Settings', 'Event', 'SHI', and 'Help'. The 'Settings' tab is selected. On the left, a sidebar menu lists 'Enclosure', 'Email Notification', 'Security', and 'System', with 'System' highlighted. The main content area is titled 'System Setting' and contains three configuration items: 'Enable auto rebuild.' with a dropdown menu set to 'Enabled', 'Enable Continue Rebuilding on error.' with a dropdown menu set to 'Enabled', and 'Set Rebuild Priority:' with a dropdown menu set to 'Medium'. A 'Submit' button is located below these settings.

Enable auto rebuild (default: Enabled)

When a physical drive fails, the controller will take the drive offline. Once you re-insert 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 the rebuild is finished, the data may be accessible but may also be inconsistent, due to any bad sectors that were ignored during the procedure. If this option is enabled, HighPoint recommends checking the event log periodically for bad sectors warnings.

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].

Event Tab

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

Icon	Name	Definition
	Information	Includes general administrative tasks: <ul style="list-style-type: none">• Create/delete arrays• Configuring spares• Rebuilding arrays• Configuring event notifications• Configuring maintenance
	Warning	Alerts issued by the Host Adapter: <ul style="list-style-type: none">• High temperatures• Sector errors• Communication errors• Verification errors
	Error	Hardware related problems <ul style="list-style-type: none">• Hard disk failure• Broken errors• Memory failure

SHI (Storage Health Inspector)

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

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.

Overview	Quick Config.	Advanced Config.	Settings	Event	SHI	Help
Storage Health Inspector(SHI)						
Enclosure ID	Port#	Device Serial Number	RAID	Temperature	Bad Sectors Found & Repaired	S.M.A.R.T
1	1	ZC12KLBT	None	Normal	None	Detail
1	2	ZC12JBHF	None	Normal	None	Detail
1	3	ZC12G5J8	None	Normal	None	Detail
1	4	ZC12HGNE	None	Normal	None	Detail
1	5	S1F0S0W3	None	Normal	None	Detail
1	6	WDH2VYMQ	None	Normal	None	Detail
1	7	WDH2VYQM	None	Normal	None	Detail
1	8	WDH2VYMA	None	Normal	None	Detail
Device Name	Device_1_1					
Model Number	ST4000NE0025-2EW107-ZC12KLBT					
Temperature Celsius	44					
S.M.A.R.T	Enabled <input type="button" value="Disable"/>					
S.M.A.R.T Attributes						
ID	Name	Threshold	Worst	Value	Status	
1	Raw Read Error Rate	44	64	83	OK	
3	Spin Up Time	0	89	92	OK	
4	Start Stop Count	20	98	98	OK	
5	Reallocated Sector Ct	10	100	100	OK	

How to Enable SMART Monitoring

To access SMART attributes of an individual disk:

1. Log in to the HRM
2. Click the **SHI** tab
3. Click **Enable** to enable SMART monitoring

Disabling SMART monitoring

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

1. Click the **SHI** tab
2. Click Detail follow the desired disk
3. Click **Disable**

Note: Disabling SMART monitoring will disable all warnings related to SMART attributes.

How to Use the Scheduler

The screenshot displays the HRM Scheduler interface. At the top, there is a navigation bar with tabs: Overview, Quick Config., **Advanced Config.**, Settings, Event, SHI, and Help. Below this is a blue header for the 'Tasks List' section. Underneath, there is a table with columns 'Name' and 'Description'. One entry is visible: 'test0' with the description 'Check all disks every day at 16:30:0' and a 'Delete' button. Below the table is the 'New Verify Task' form. It starts with a radio button for 'RAID_5_0' and a 'Task Name' input field. There are two scheduling options: 'Occurs one time on' with a date and time selector (2017-5-19 at 0:0:0) and 'Occurs every' with a frequency dropdown (1 Day(s)), a day selector (Sunday), and a count (1) at a time (0:0:0). There are also 'Start date' and 'End date' fields, with a 'No end date' option selected. A 'Submit' button is at the bottom. Below the 'New Verify Task' form is the 'Health Inspector Scheduler' form. It has a 'Task Name' input field, a 'Select a Schedule' section with radio buttons for Daily, Weekly (selected), Bi-Weekly, and Monthly, and a 'Select a time' section with a day dropdown (Sunday), a frequency dropdown (1), and a time selector (0:0:0). A 'Submit' button is at the bottom.

The **Scheduler** 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 into the HRM
2. Select the proper controller from the top left drop down
3. Click **SHI**
4. Click **Schedule a task**
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
8. One time verify task on specific date (YYYY-MM-DD) at (HH:MM:SS, 24-hr clock)
9. Or a specific schedule you can adjust based on Daily, Weekly, or Monthly options
10. Click **Submit**

11. 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 5: 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, your array as a whole is still accessible, but one or more disks are faulty (depending on your RAID level), and the array is in danger of failing.

Common scenarios for critical status

- **Unplugging a disk that is part of an array**
 - **Bad sector is detected on a disk that is part of an array**
 - **Unrecoverable data during rebuilding**
 - **Defective port or cable interrupts rebuilding process**
-

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 HRM Logical tab and Event tab.
3. Re-insert the faulty disk or replace with a new disk.
 - The array will rebuild automatically if your auto-rebuild setting is enabled and you reseated the faulty disk. **Note:** Click **Rescan** if the 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 into the HRM
 - Click **Advanced Config.** 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 the HighPoint HRM.

1. Log into the HRM
2. Click **Settings** tab
3. 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 array to the previous state.

1. Shut down your PC
2. Shut down the RocketStor6114VEnclosure
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.

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.

Help

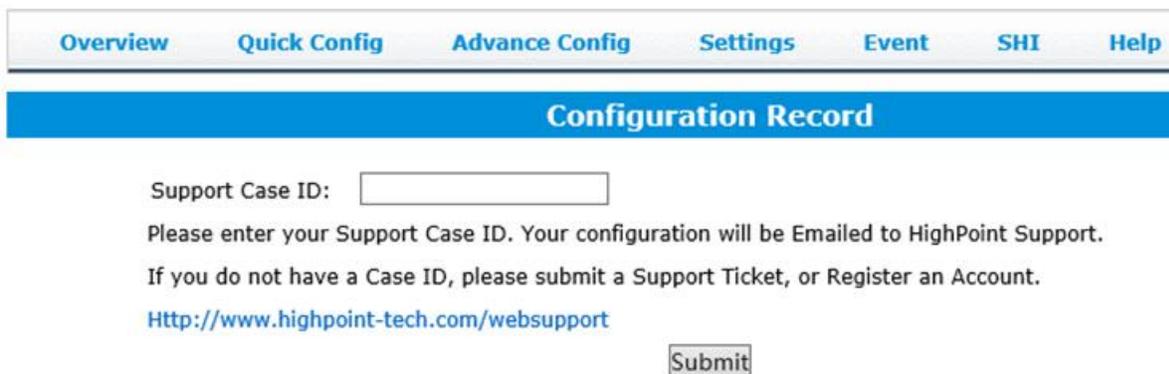
- Online Help
- Register Product
- Configuration Record

Online Help redirects you to additional documentation concerning the HRM.

Register Product takes you to the HighPoint Online Web Support Portal. On this page you can create a new customer profile where you can register your product, or post an online support ticket

Configuration Record: collect the RocketStor's storage information and send it to the HighPoint support team.

It is required to register the product on HighPoint Web Support Portal and request the support ID before submit the Configuration Record:



The screenshot shows a web interface with a navigation bar containing links: Overview, Quick Config, Advance Config, Settings, Event, SHI, and Help. Below the navigation bar is a blue header for "Configuration Record". The main content area contains a form with a label "Support Case ID:" followed by an empty text input field. Below the input field is the instruction: "Please enter your Support Case ID. Your configuration will be Emailed to HighPoint Support. If you do not have a Case ID, please submit a Support Ticket, or Register an Account." A blue hyperlink "Http://www.highpoint-tech.com/websupport" is provided. At the bottom right of the form is a "Submit" button.

Table 1. HRM 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.
	Verifying The array is currently running a disk integrity check.
	Rebuilding The array is currently rebuilding meaning you replaced a failed disk or added a new disk to a 'critical' state array.
	Critical - rebuild required The array has all disks, but one disk requires rebuilding.
	Disabled The icon represents a disabled array, meaning more than one disk failed and the array is no longer accessible
	Initializing The array is initializing. The two types of initialization are Foreground and Background. (See Initialization)

	Uninitialized The array initialization process has been interrupted, and the process is incomplete.
	Not Initialized Disk is not initialized yet, and needs to be initialized before use
	OCE/ORLM Array is performing a OCE/ORLM operation
	OCE/ORLM has stopped The array expansion process has been stopped.
	Legacy An existing file system has been detected on the disk. These disks are classified as legacy drives.
	Spare The device is a spare drive, it will automatically replace any failed drive part of an array.
	Normal The array status is normal
	Initializing The array is initializing, either foreground or background initialization
	Initialization Stopped The initialization has been stopped. Current status is uninitialized.
	Critical - Inconsistency 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.
	Rebuilding The array is currently rebuilding.
	Verifying The array is performing a data consistency check. Array status will show

'verifying'.



Disabled

The array does not have enough disks to maintain the RAID level. A disabled array is not accessible.



OCE/ORLM

Array is expanding its capacity or migrating to a different raid level. Status will display 'Expanding/Migrating'



OCE/ORLM stopped

The 'Expansion/Migrating' process has been stopped. The status will display 'Need Expanding/Migrating'



Critical - OCE/ORLM

A disk member is lost during the OCE/ORLM process.



Critical - OCE/ORLM - rebuild

The expanding/migrating array requires a rebuild.

Table 2. RAID Level Reference Guide

Type	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 results in complete data loss	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	67-87%	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 50	Disk Mirroring followed by RAID5	6	67-75%	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
RAID 6	Disk Striping with dual rotating parity	4	50-75%	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

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.

http://www.highpoint-tech.com/PDF/Compatibility_List/HighPoint%20RAID%20Storage%20and%20HBA%20Hard%20Drive%20Compatibility%20List.pdf

Contacting Technical Support

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