RocketStor 6414VS
User Manual

January 15th, 2016
Revision 1.4
HighPoint Technologies, Inc.

Trademarks
Companies and products mentioned in this manual are for identification purpose only. Product names or brand names appearing in this manual may or may not be registered trademarks or copyrights of their respective owners. Backup your important data before using HighPoint's products and use at your own risk. In no event shall HighPoint be liable for any loss of profits, or for direct, indirect, special, incidental or consequential damages arising from any defect or error in HighPoint's products or manuals. Information in this manual is subject to change without notice and does not represent a commitment on the part of HighPoint.

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)

Table of Contents

Product Overview

The RocketStor 6414VS bundle package includes an enclosure for housing your physical drives and a RAID Controller to manage and create RAID arrays of different levels.

- RocketStor 6414S Enclosure
- HighPoint RocketRAID 644LS Controller

Kit Contents

Item	Count
4-Bay Tower Enclosure	1
4-Port SATA 6Gb/s Value RAID PCIe 2.0 x4 Host Adapter	1
Low Profile Bracket	1
Disk Trays	4
SFF-8088 (Q-SATA) Cable	1
UL Power Cord	1
3.5” HDD mounting screws	16
2.5” SSD mounting screws	16
Quick Installation Guide	1

Feature Specifications	RocketStor 6414VS
Form Factor	4-Bay Enclosure
Host Interface	1x Mini-SAS (SFF-8088)
RAID Controller/ Bus Interface	RocketRAID 644LS / PCIe 2.0 x4
RAID Level	0, 1, 5, 10,and JBOD
Max. Capacity	Up to 32TB
# Of Drive	Up to 4

Drive Interface	SATA
Drive Form factor	3.5" HDD supported
Operating System Support	Window Server 2008 and above, Windows 7 and above, Major Linux Distributions, FreeBSD, Mac OS X 10.8.5 and later.
Certification	CE, FCC, RoHS
Warranty	1 Year
Dimension	8.66”(H)x5.31”(W)x8.67”(D)
Weight	
Enclosure Monitoring Feature Suite	
Material	Brushed Aluminum housing
Alarm	Audible Alarm (mutable) for Fan Failure or Temperature warning (over 50˚ C)
RAID Feature Suite	Flash ROM for Upgradeable Firmware
	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
	Disk Format compatible: 512, 512e
	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

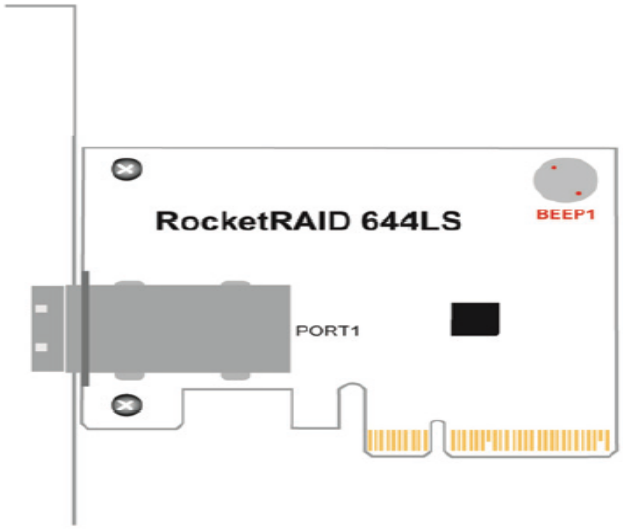
RocketStor 6414S Enclosure Overview

Front Panel Overview

Back Panel Overview

Front Panel	
Disk Present LED	Indicates disk is present and available
Disk Status LED	Indicates disk is performing I/O operations
Enclosure Power LED	Indicated enclosure is properly powered
Back Panel	
Mini-SAS port	SFF-8088 port
Mute Button	Mutes enclosure alarm only. Alarm sounds off only when FAN and TEMPERATURE fail.
Power Receptacle	Connect power cord here
On/Off Switch	O – Off / I - On

RocketRAID 644LS Overview



RocketRAID 644LS Key	
PORT1	mini-SAS (SFF-8088) Connection Corresponds to channel 1-4
BEEP1	Alarm/Beeper

Getting Started

Thank you for purchasing HighPoint Technologies RocketStor 6414VS. You are only a few steps away from utilizing RAID storage using the industry's most affordable hardware RAID solution.

To start using your RocketStor 6414VS take the following steps:

1. Setting up the Hardware (pg. 8)
2. Install/Update drivers (pg. 10)
3. Install HighPoint RAID Management (WebGUI) (pg. 15)
4. Create RAID Arrays (pg. 18)
5. Initialize and format RAID Volumes (pg. 23)

Step 1: Setting Up the Hardware

Ensure all items listed under Kit Contents are included in your package. For any discrepancy contact your reseller or submit a support ticket online at www.highpoint-tech.com/websupport.

Preparing the Enclosure

1. Press then pull the blue tab on the disk tray to unlock and slide the disk tray out. Then mount your hard drives onto the tray using the provided screws. Repeat for up to four hard drives.

3.5" HDD Mounting Holes

2.5” SSD Mounting Holes

2. Place the enclosure upright on a stable, flat surface.
3. Connect the enclosure to a power source with the AC Power Cord.
4. Connect the enclosure to the included RocketRAID 644LS using the mini-SAS to mini-SAS cable (SFF-8088).

Preparing the HBA (Host Bus Adapter)

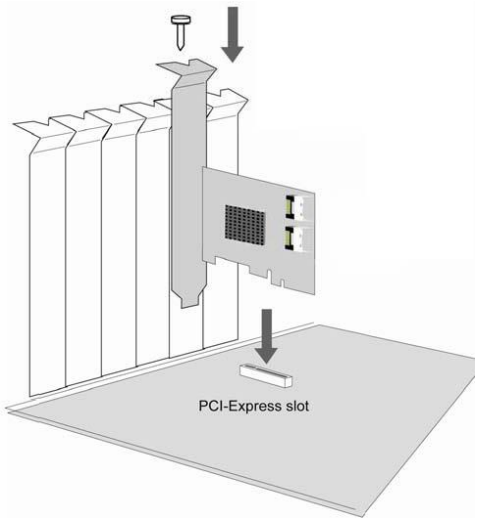
The following instructions describe how to prepare your RocketRAID 644LS HBA for use.

To install your RocketRAID 644LS:

Important: Before installing the RocketRAID 644LS Controller, ensure that your system is powered OFF.

1. Locate a PCIe 2.0 x4 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 644LS 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 x4 card is compatible with PCI-Express 2.0 x16 and PCI-Express 3.0 x16 slots, as well as PCIe 2.0 x8, PCIe 3.0 x8 slots.

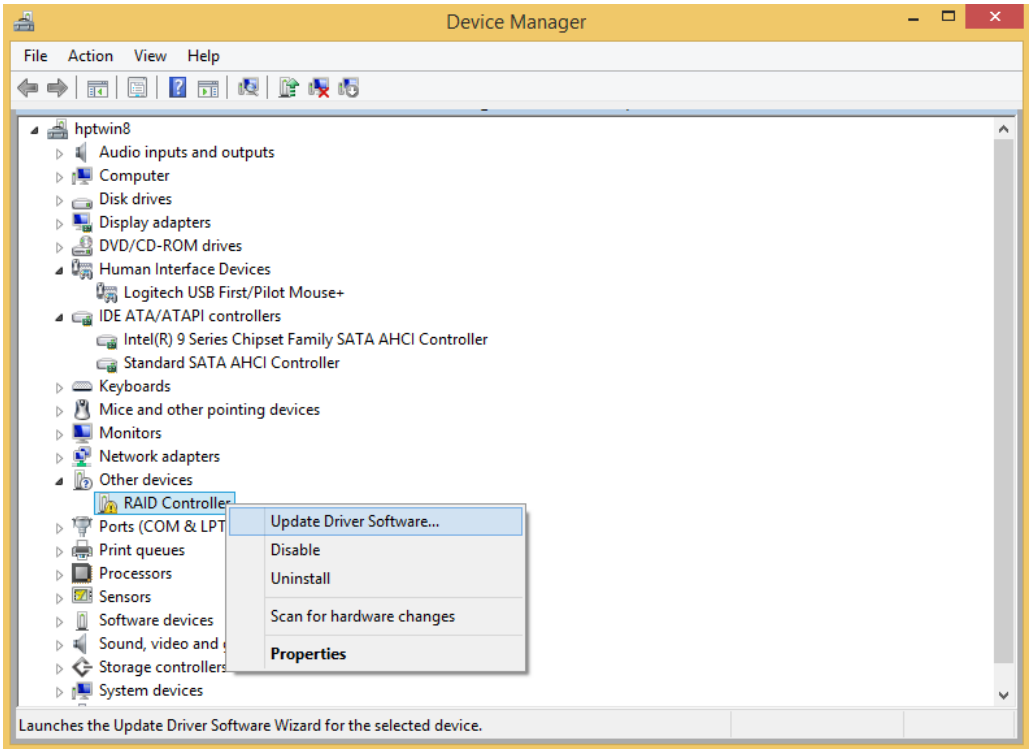


Step 2: Install/Update Drivers

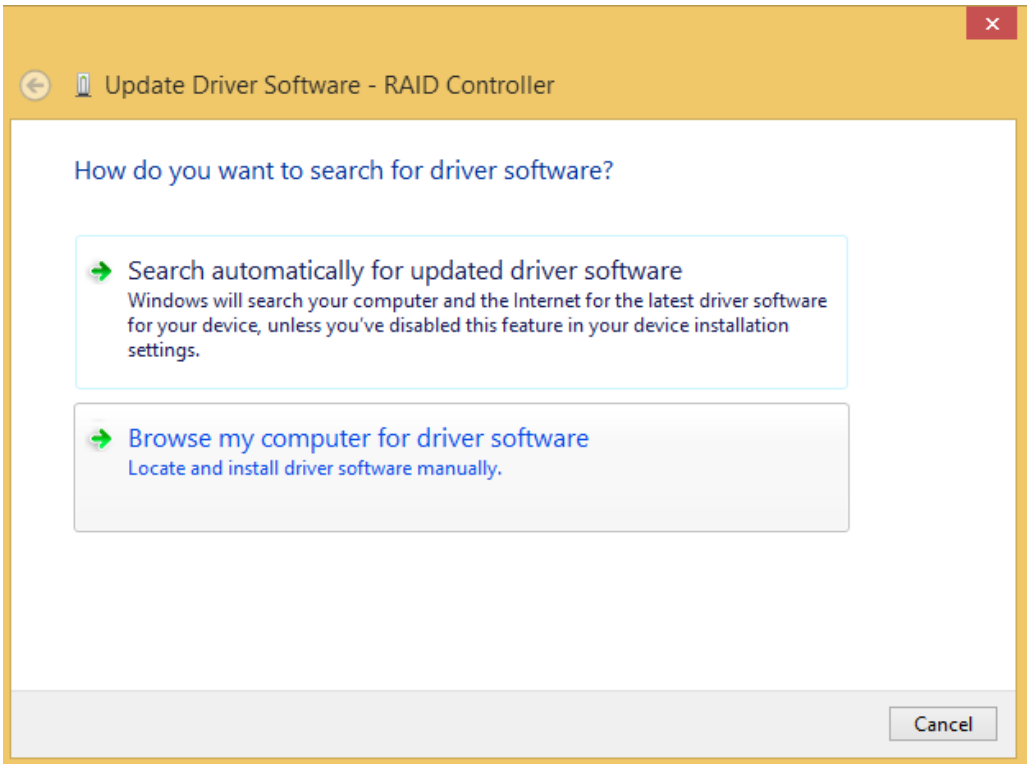
Drivers provide a way for your operating system to communicate with your new hardware. Updating to the latest drivers ensures your product has the latest performance, stability, and compatibility improvements. Drivers are updated regularly at www.highpoint-tech.com

For **Windows** Users:

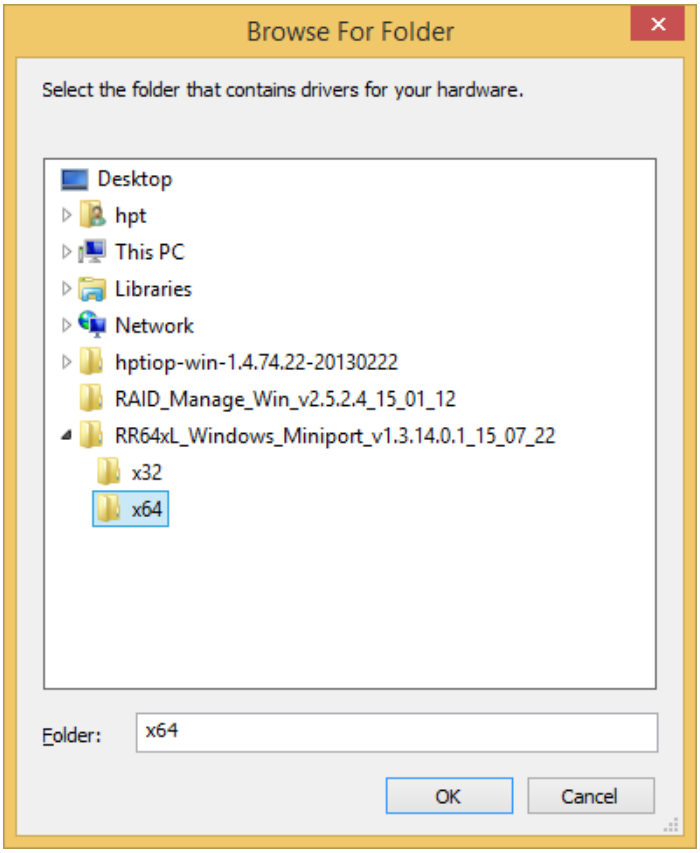
1. Download the latest driver files from our website www.highpoint-tech.com > Support > Documents and Downloads > RocketStor 6414VS.
2. Extract the downloaded files onto your PC and note the location of the files.
3. Open Windows **Device Manager** (Control Panel > Hardware and Sound > Devices and Printers > Device Manager).
4. Under Other devices, right-click **RAID Controller.**
5. Click **Update Driver Software.**



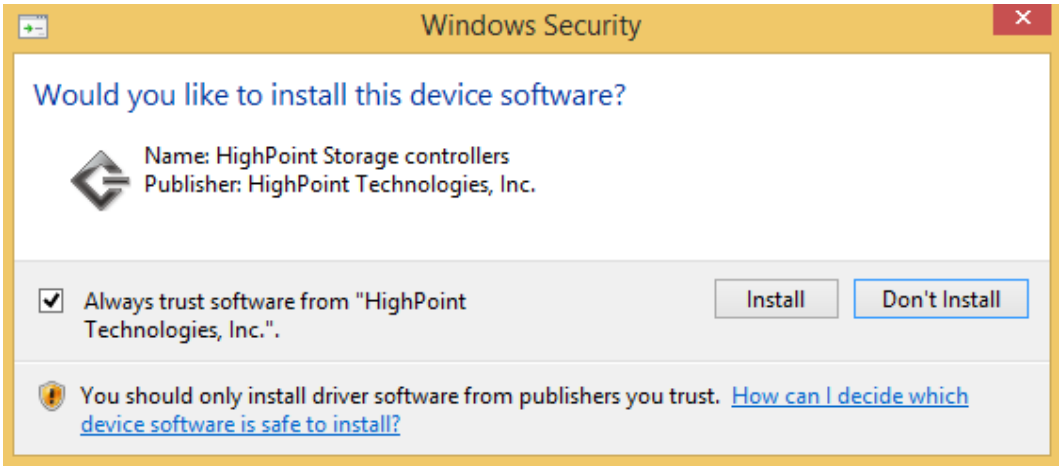
6. Click **Browse my computer for driver software.**



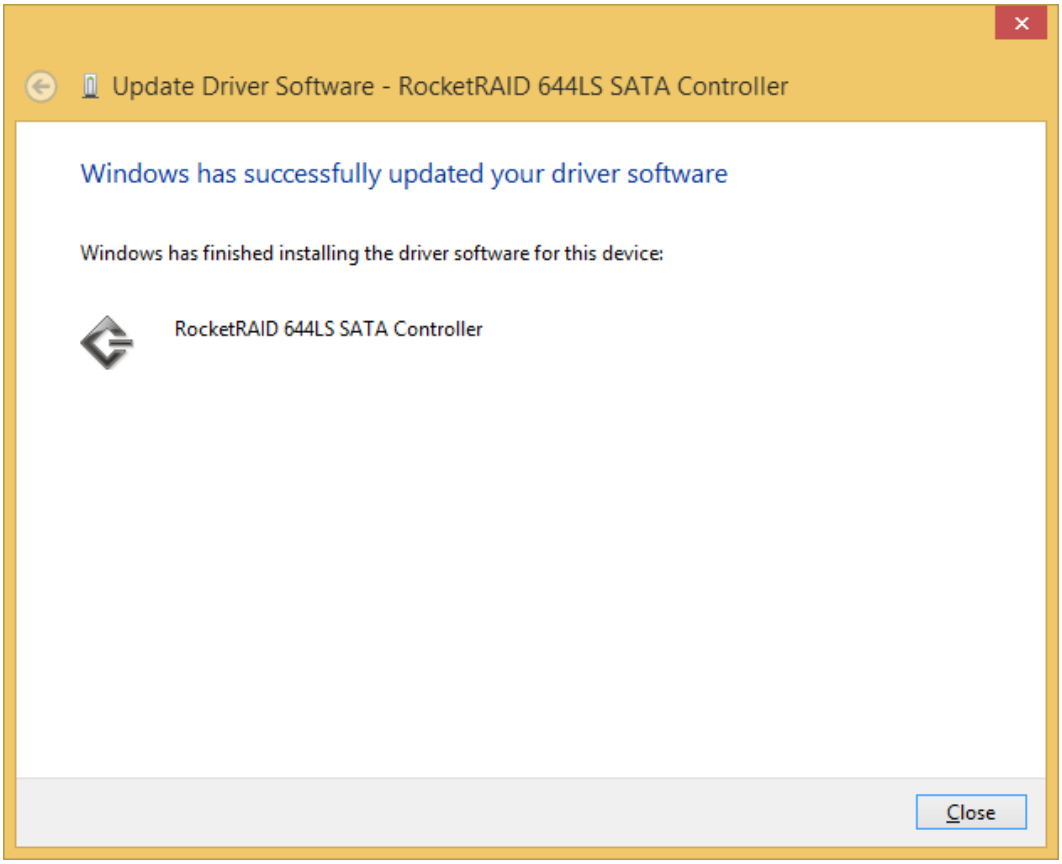
7. Navigate to where you saved the driver files.



8. Click **OK.**
9. Click **Next**, Windows security will prompt to ask if you are sure you want to install HighPoint Software.



10. After clicking **Install**, driver will be installed.



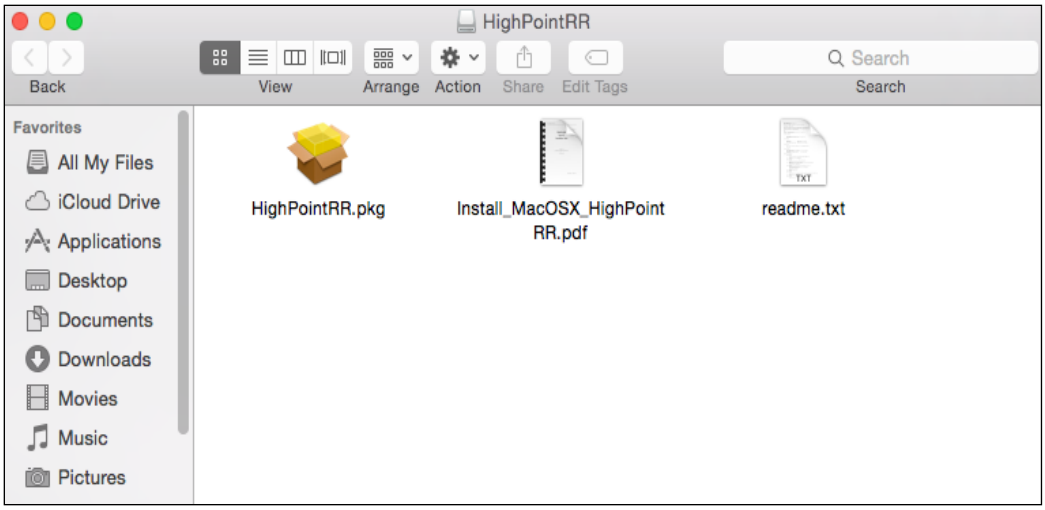
11. **Reboot** for changes to take effect.

For **Mac** Users:

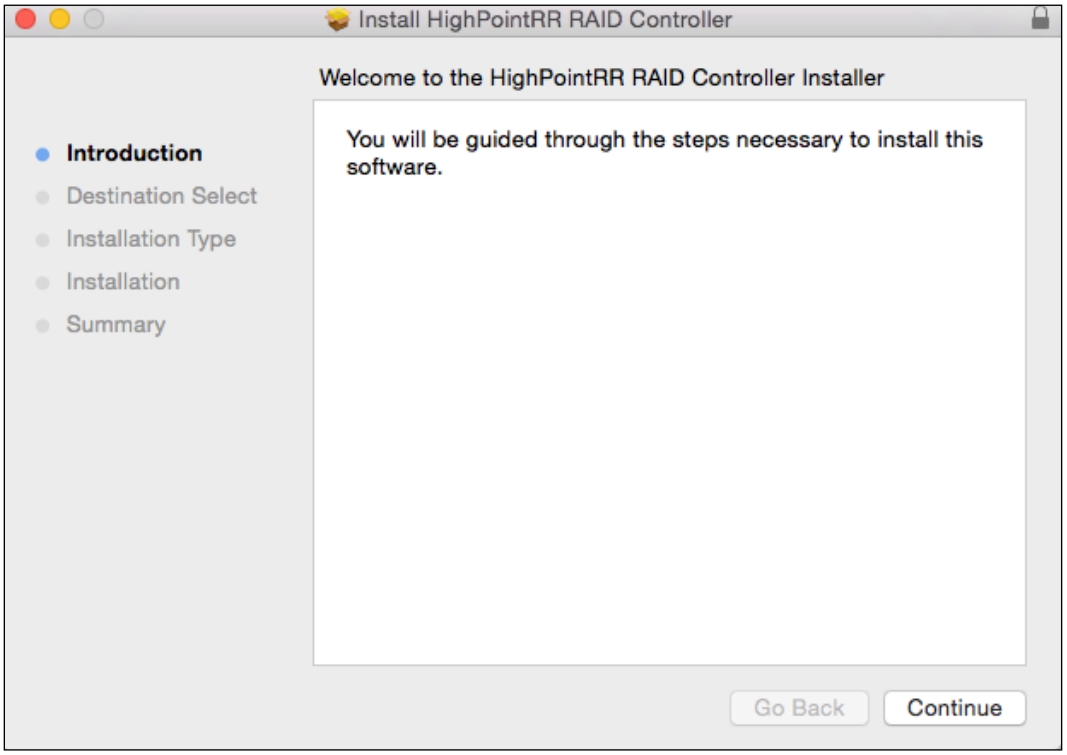
For OSX 10.9 and later, drivers are embedded in the OS and do not need to be installed.

1. Obtain latest **RocketRAID 644LS** driver online at www.hptmac.com> PCIe Controller Card > 6 Gb/s SATA RAID HBA > RocketRAID 644LS > Download
2. Click the downloaded file.

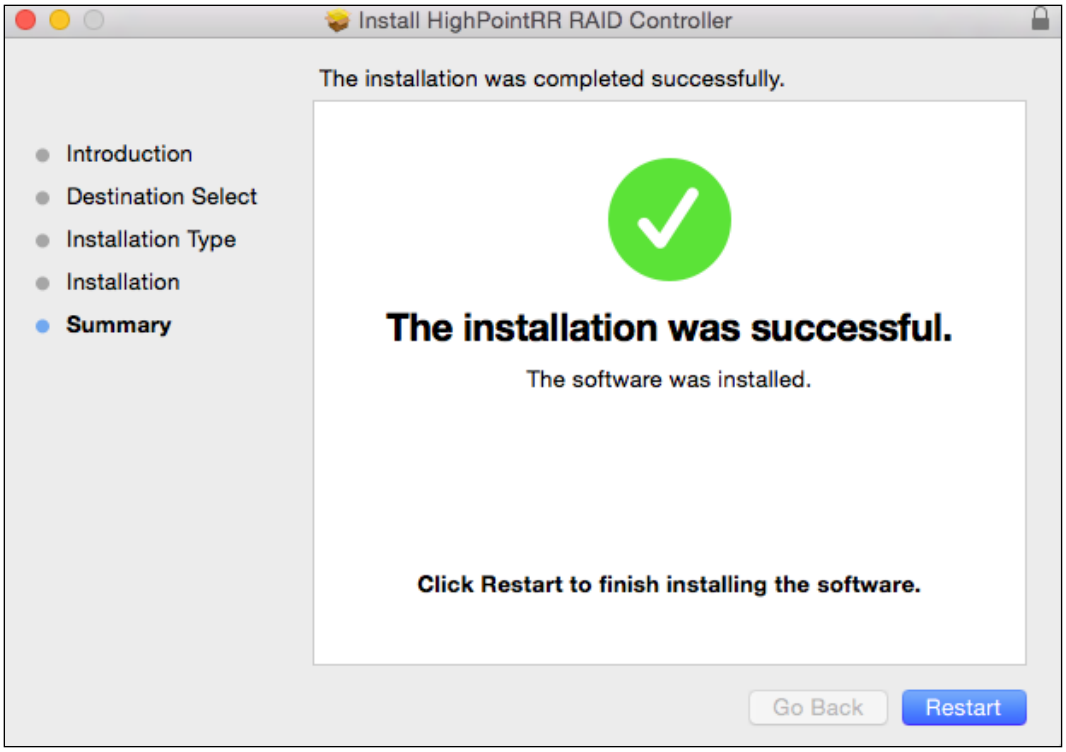
3. A mounted volume (**eg**. HighPointRR) will appear on the desktop. Click to open the volume.
4. Click the driver package to start installation (~.**pkg** file)



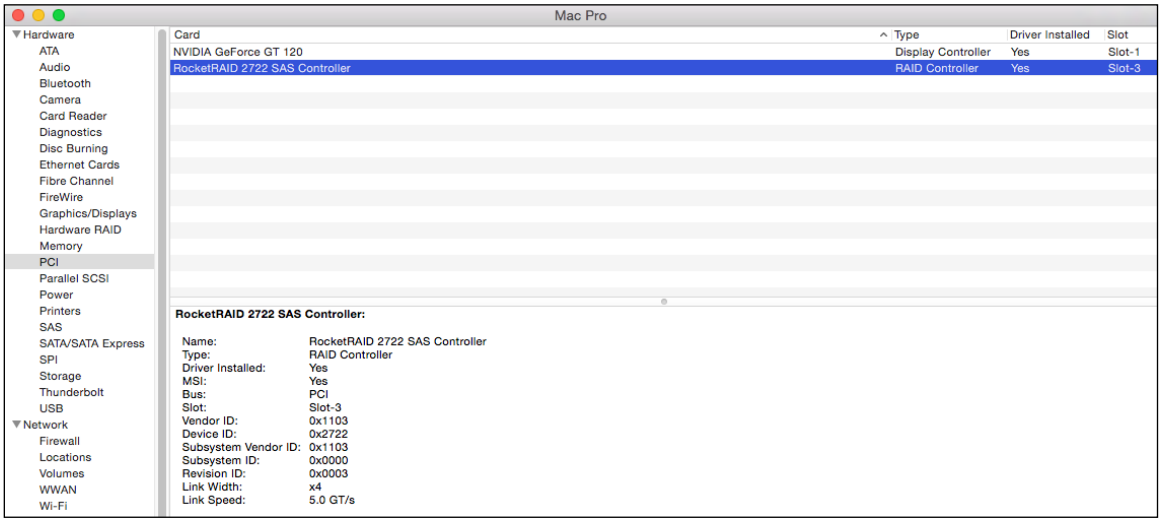
5. Follow the on-screen instructions of the installer.



6. **Reboot** computer for changes to take effect.



7. Make sure **Driver Installed** is **Yes.** Click **Apple Icon > About this Mac... > System Report > PCI** to check driver status information.



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

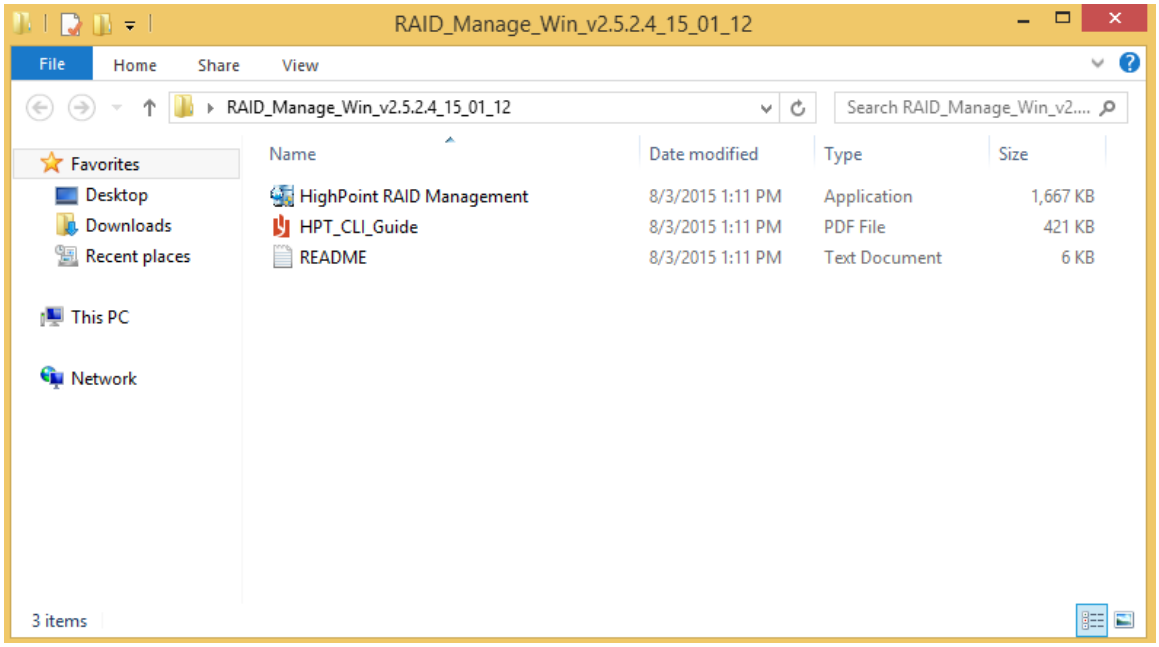
Step 3: Install HighPoint RAID Management (WebGUI)

The HighPoint RAID Management (WebGUI) software is necessary to create, maintain, and view your RAID arrays.

For **Windows** Users:

1. Download the latest WebGUI from our website at www.highpoint-tech.com > Support > Documents and Downloads > RocketStor 6414VS > Windows WebGUI

2. Extract and open the contents of the downloaded file.



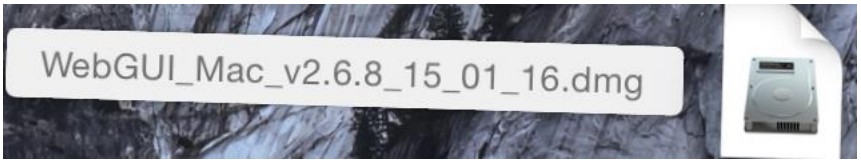
3. Double-click **HighPoint RAID Management.exe**

4. Follow the on-screen instructions to complete the WebGUI installation
5. Double-click the HighPoint RAID Management desktop icon to start the WebGUI

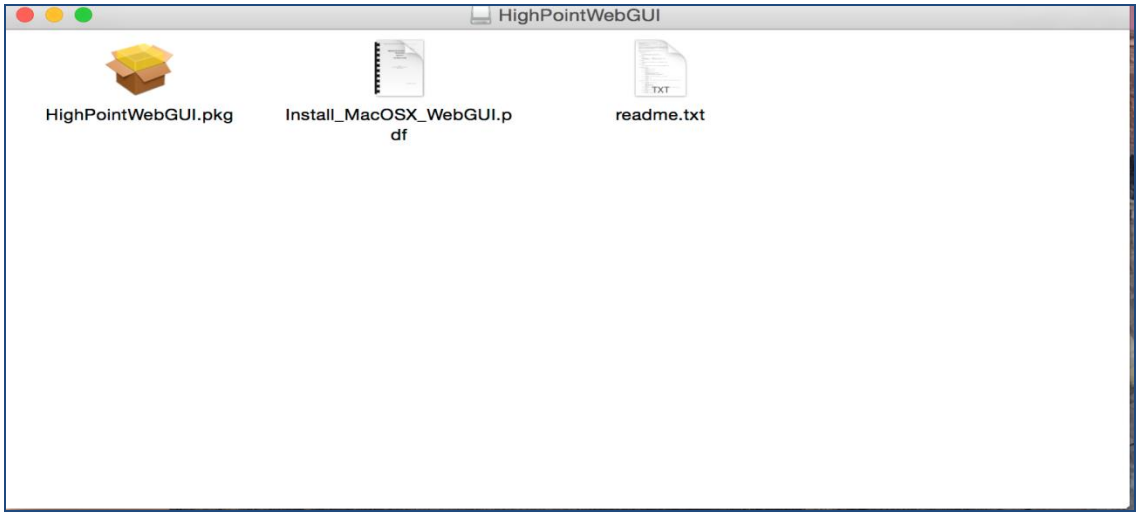
6. Your default web browser will open and prompt for username and password (Default username: **RAID** / password: **hpt**). Username and password are case-sensitive.

For **Mac** Users:

1. Download the latest WebGUI from our website www.hptmac.com> PCIe Controller Card > 6 Gb/s SATA RAID HBA > RocketRAID 644LS > Download
2. Double Click the downloaded Mac WebGUI file.



3. Double click the **HighPointWebGUI.pkg** to start the WebGUI installer.



4. Follow the installer on-screen instructions to complete the WebGUI installation.
5. Double-click the HighPoint RAID Management desktop icon to start the WebGUI.

6. Your default web browser will open and prompt for username and password (Default username: **RAID** / password: **hpt**). Username and password are case-sensitive.

Uninstalling the WebGUI

For **Windows** Users:

1. Open Control Panel.
2. Click Uninstall a program.
3. Select **HighPoint RAID Management** to uninstall.

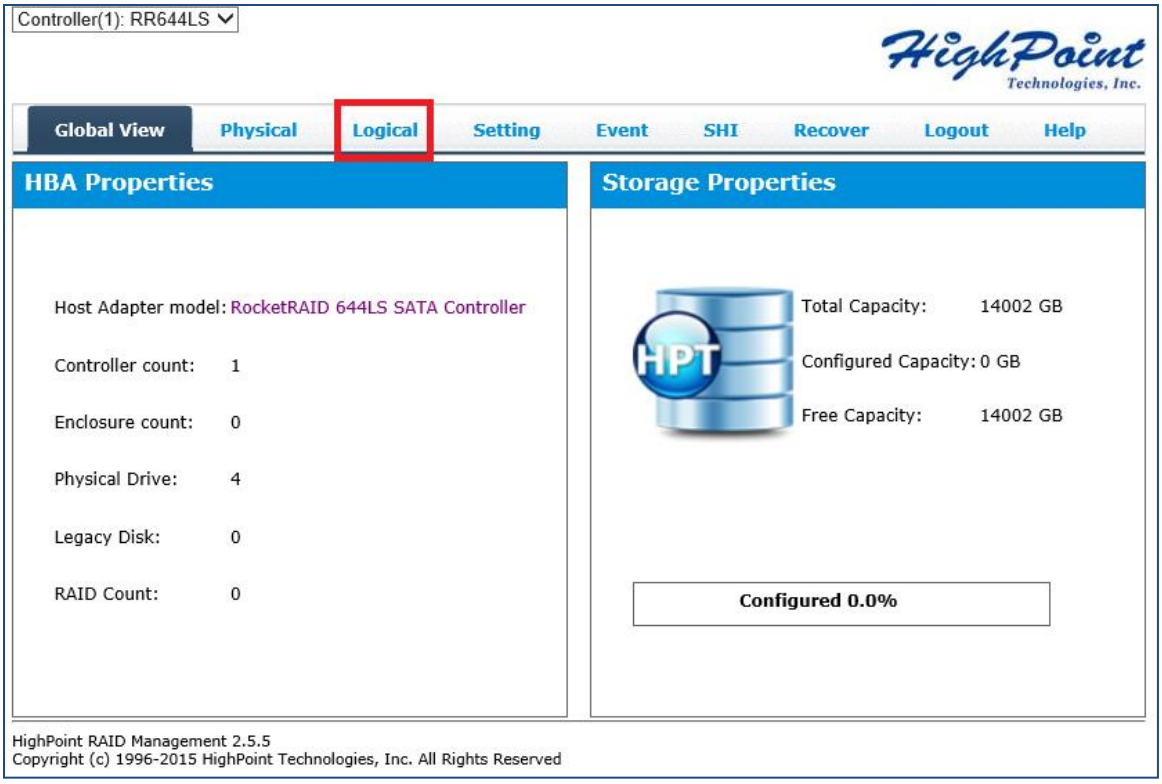
For **Mac** Users:

1. Navigate to **/Applications/HPTWEBGUI/uninstall.**
2. Click on the uninstall script.
3. Type in the Administrator password when prompted.

Step 4: Create RAID Arrays using WebGUI

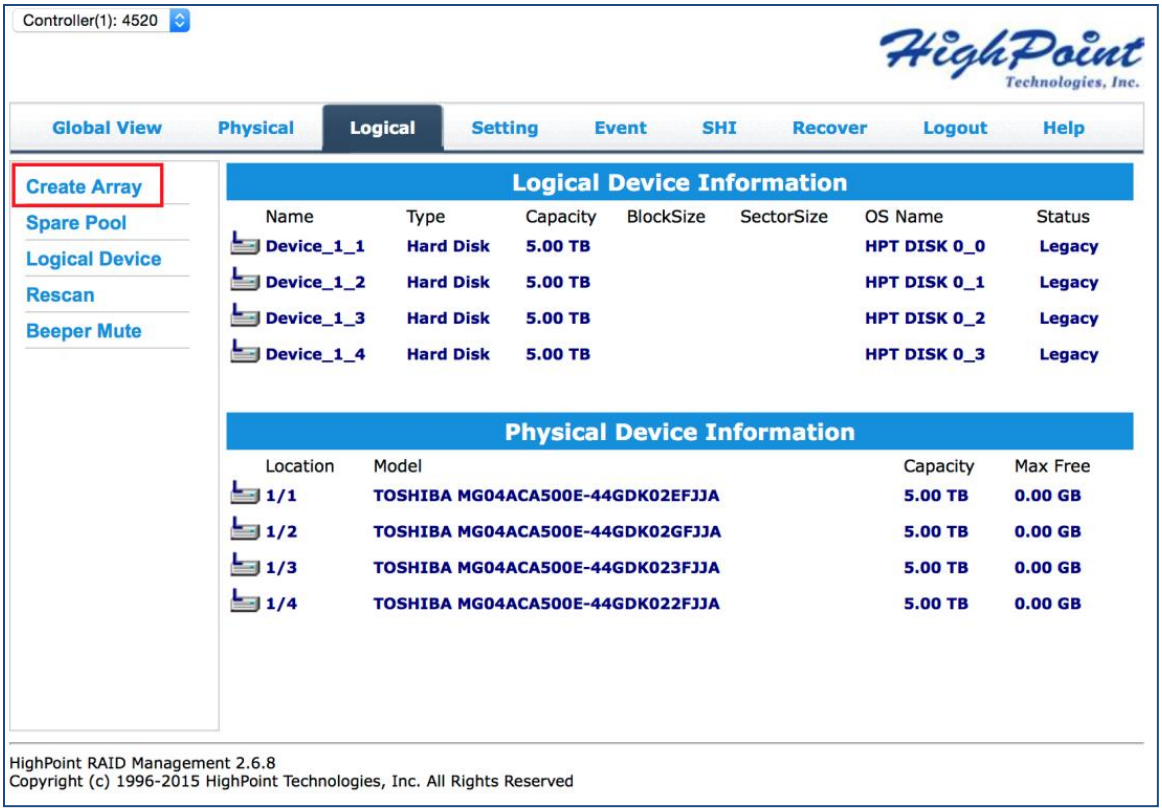
For both **Mac** and **Windows** users:

1. Login to WebGUI (Default username: **RAID** / password: **hpt**).
2. Once logged in, click the Logical tab.

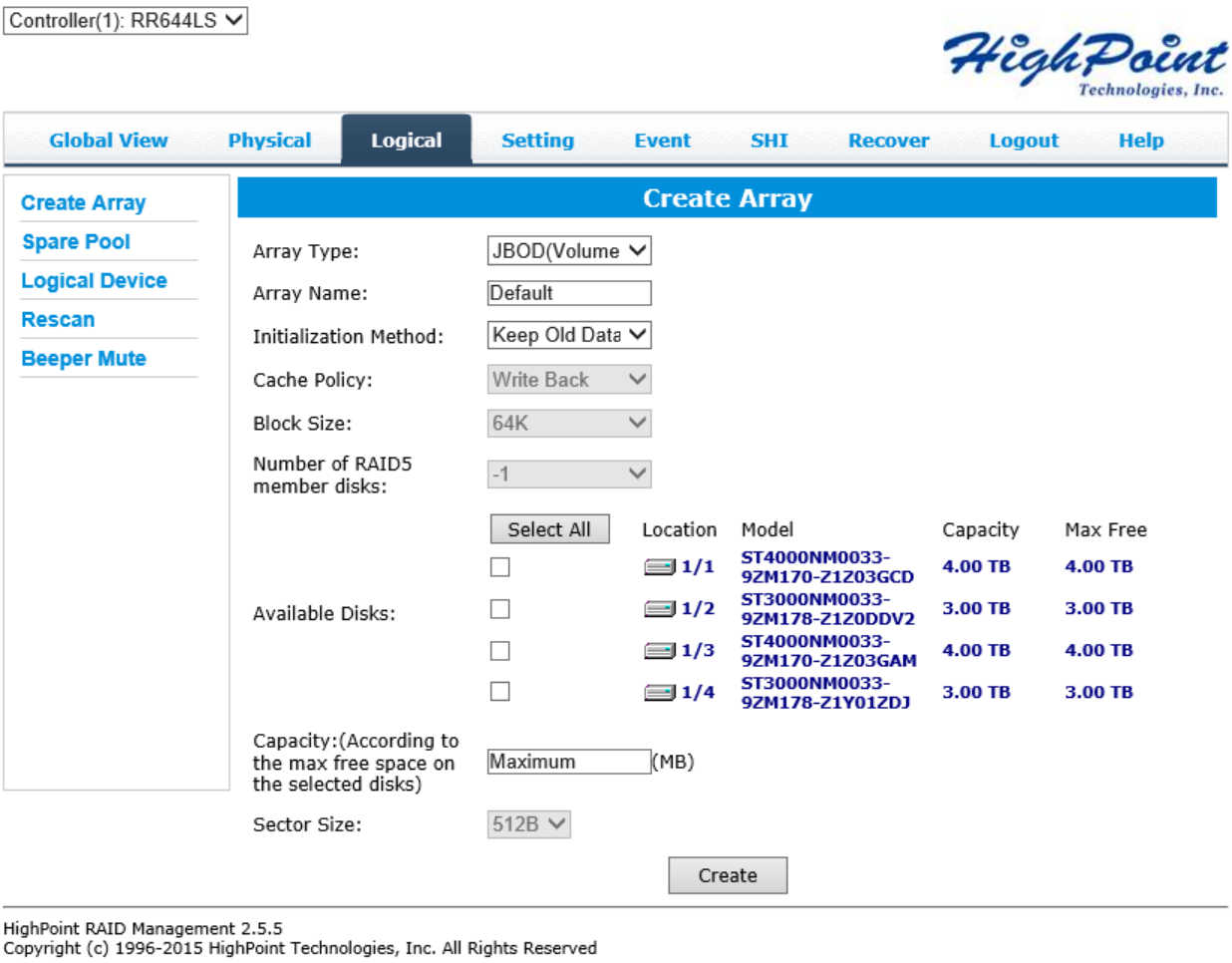


Click Logical to go to create array page.

3. Click Create Array:

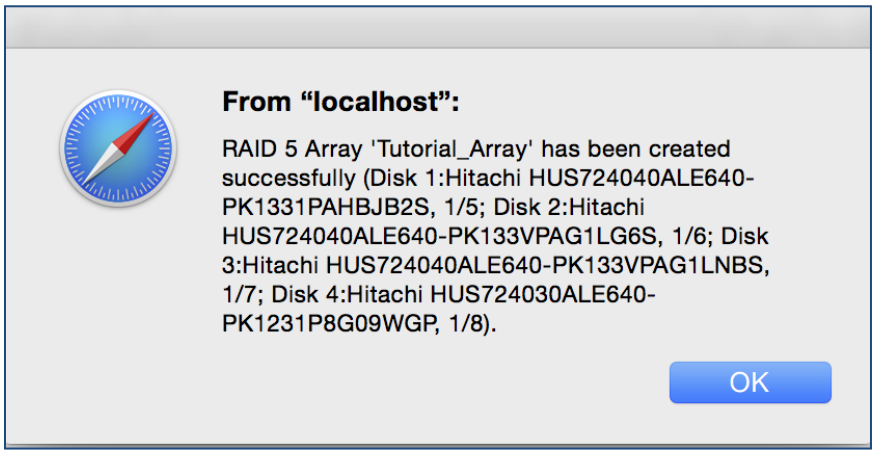


4. The RAID creation page provides many features, options, and settings. Detailed descriptions are provided on pg. 47.
5. Select **RAID 5** for Array Type. (RAID Quick Reference on pg. 64)
6. Set array name as “Tutorial_Array”.
7. Select **Quick Init** as the initialization method. (**Note**: Quick Init gives immediate access to the array by skipping parity synchronization. Recommended for testing/verification purposes or when new disks are used.)
8. Select **Write Back** as the **Cache Policy** for better disk write performance.
9. Select **64K** as the **Block Size**.
10. Select all 4 available disks.
11. Leave the **Capacity**, **Sector Size**, and **Disk Cache Policy** settings at their default values.
12. Click **Create**

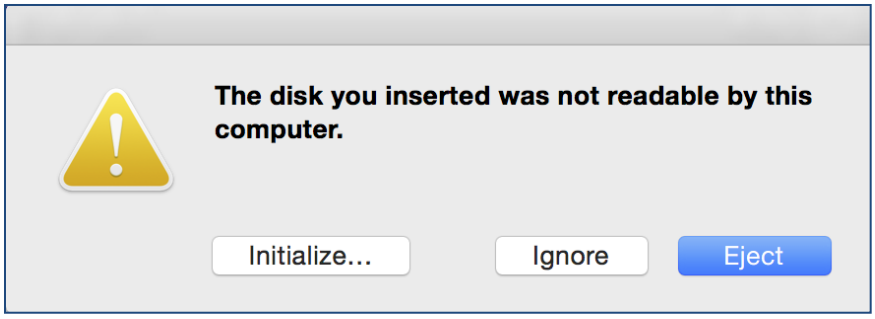


Create Array page.

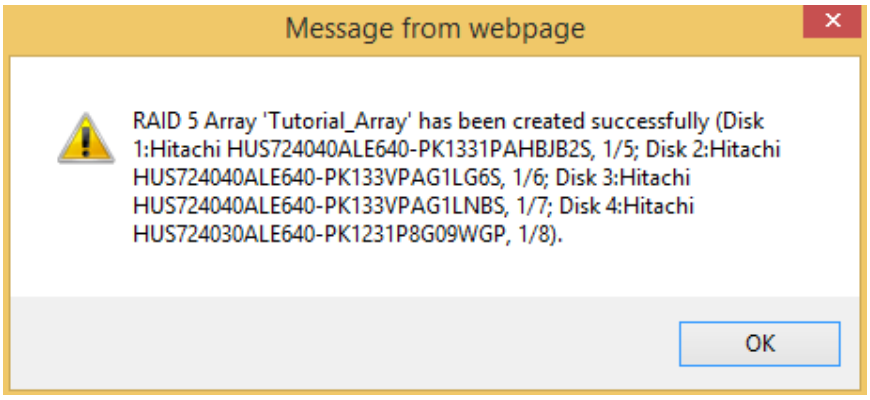
13. Once created, the WebGUI will acknowledge the array has been created and the system will prompt you to initialize the new volume.



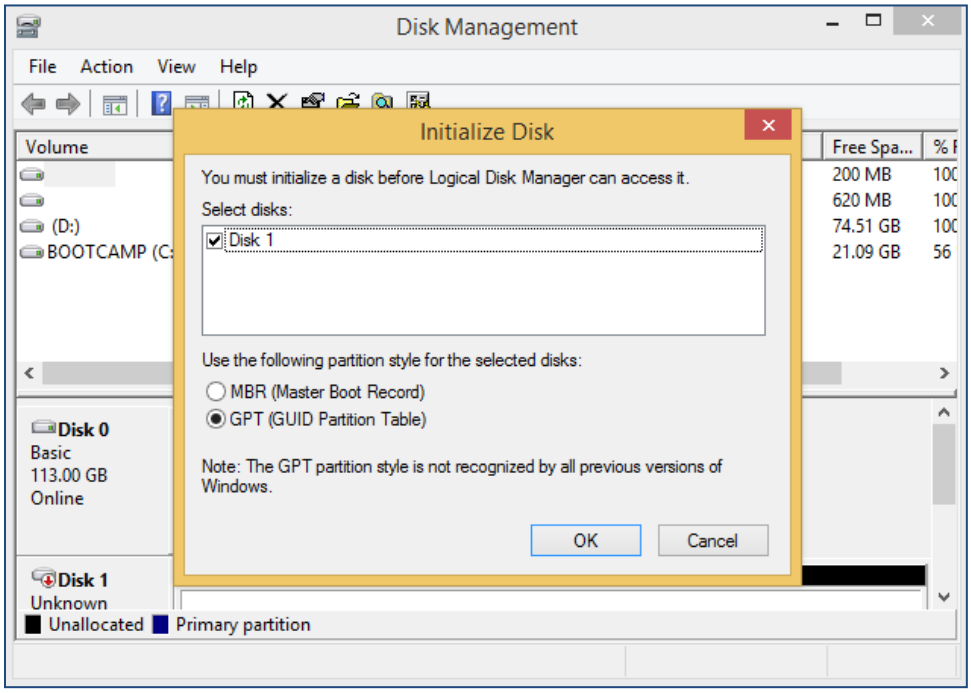
(Mac OS X) Array successfully created.



New volume needs to be initialized before use.

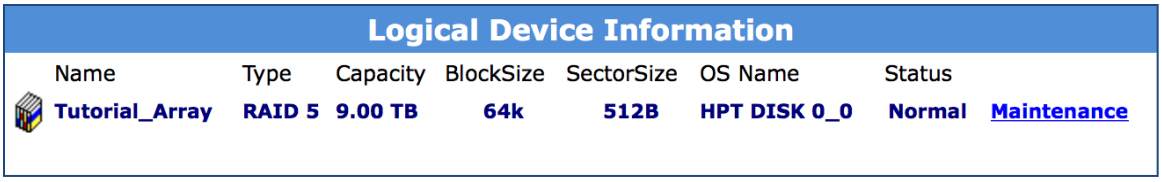


(Windows) Array successfully created.



(Windows) For Windows platforms, user will be prompted to initialize disks in Disk Management.

14. Tutorial_Array can now be seen under Logical Device Information. **(Take note that the OS name is HPT DISK 0_0; this will help identify which volume to initialize)**



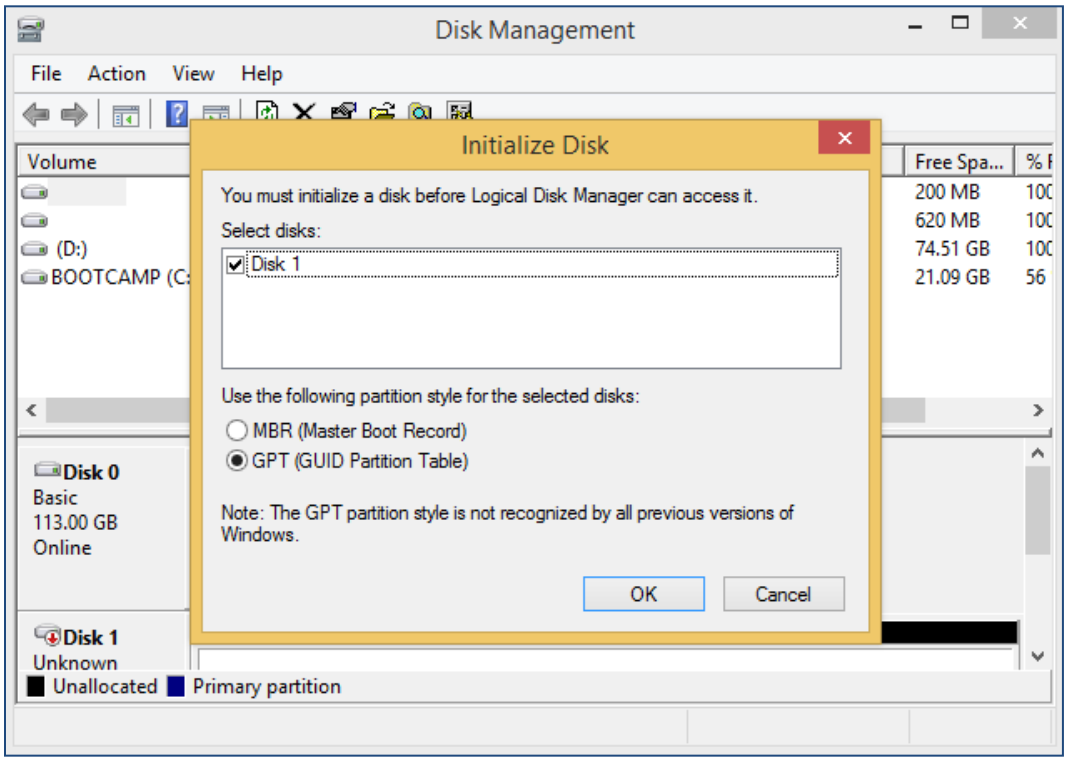
Tutorial_Array is now created and can be seen in Logical tab.

Step 5: Initialize and format the RAID Array

Before using the newly created RAID array, you must initialize and format the new volume.

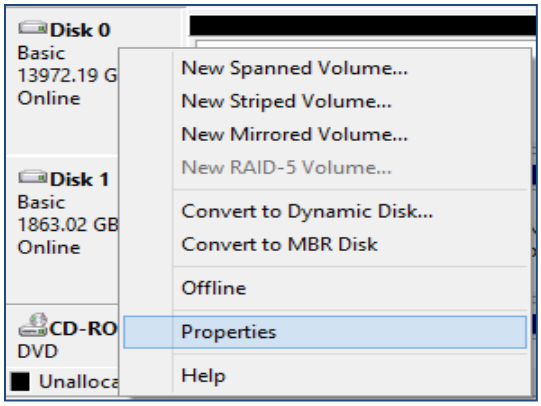
For **Windows** Users:

1. After creating the RAID array, open Windows **Disk Management.**
2. Disk Management will ask to initialize unknown disks either in MBR format or GPT.

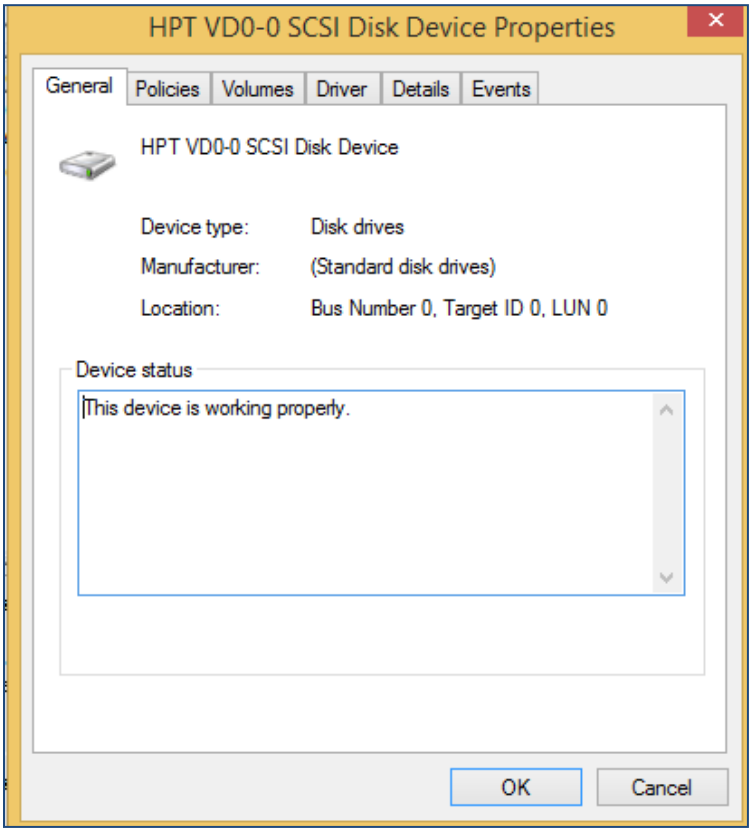


(Windows) Disk Management asks to initialize the disks before use. As a general rule, select MBR for disks less than 2TB and GPT for disks greater than 2TB.

3. Right click the new disk, and click properties.

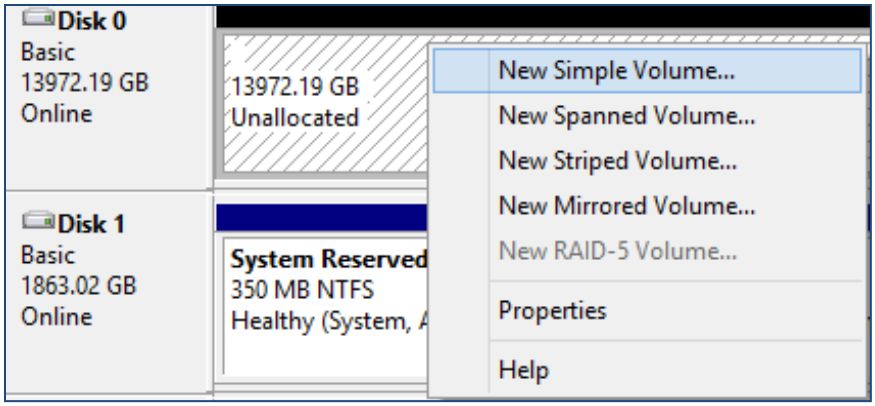


4. In properties, check and make sure it is a HPT VD (HighPoint Virtual Disk).



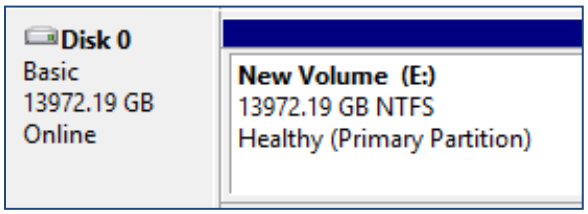
Disk properties show HPT VD 0-0.

5. Once the disk has been confirmed, right click the unallocated space and click New Simple Volume.



Right Click unallocated space, then click New Simple Volume.

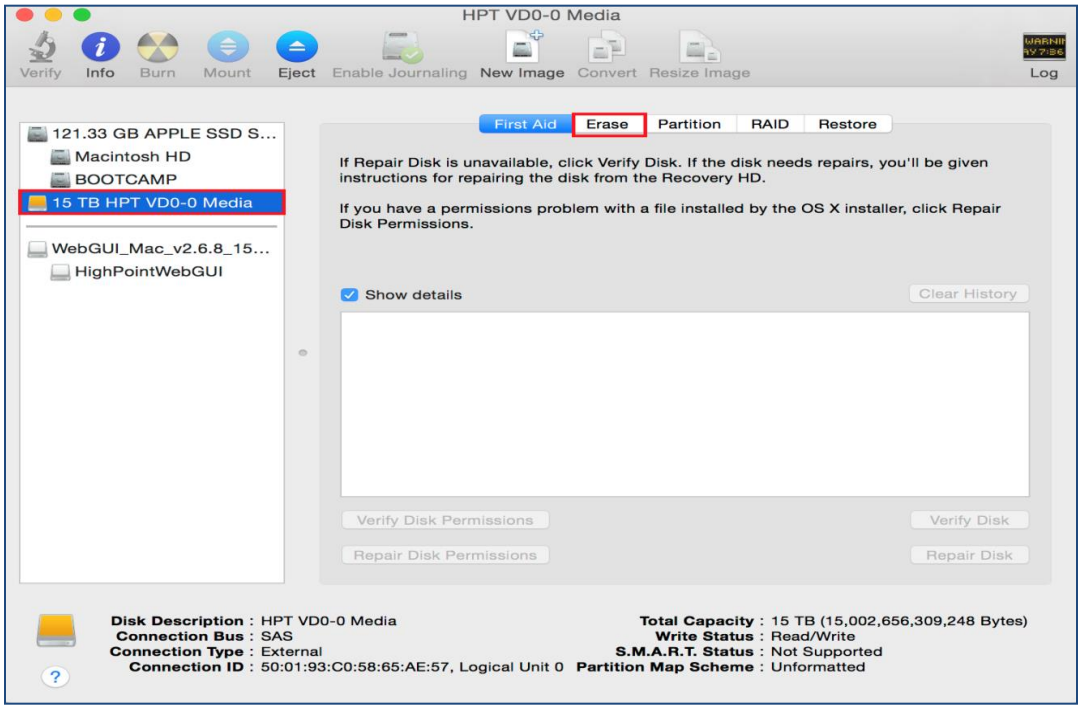
6. Follow the on-screen instructions to configure and format the drive.
7. Once finished, the new volume will receive a drive letter and be available for use.



RAID array is now formatted as NTFS and drive letter E:

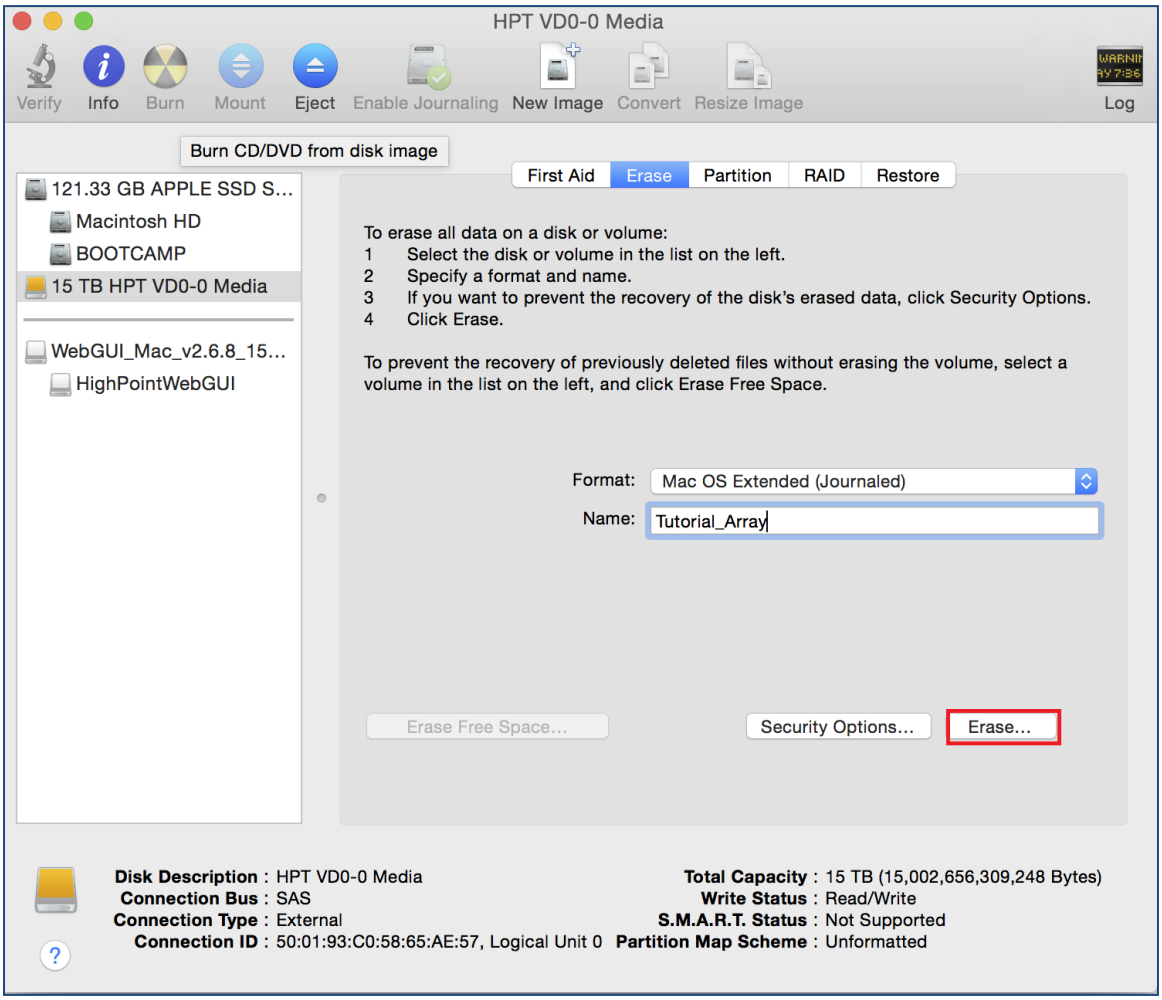
For **Mac** Users:

1. After creating a RAID array, click Initialize when prompted. (**Note**: If you ignored the prompt, simply open Disk Utility).

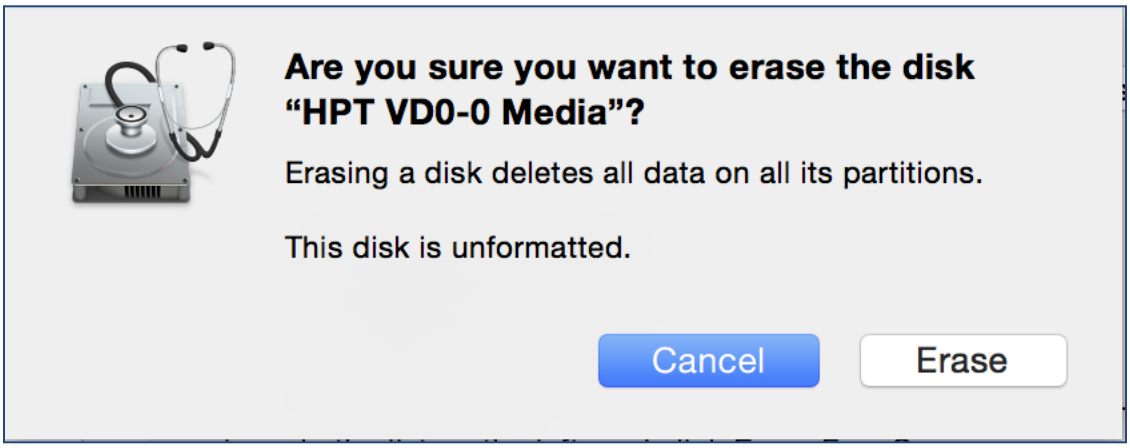


Disk Utility for Mac.

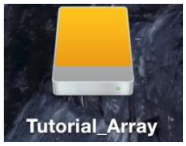
2. In Disk Utility, select the Volume you created on the right, then click the Erase tab.



3. Select the desired disk format and disk name then click **Erase**. (**Note**: All previous data on disks will be erased.)



4. When finished, your new RAID volume will be available for use.



(Mac) Tutorial_Array volume mounted on desktop.

Manage your RAID array

The following features allow you to monitor and maintain your arrays to prevent any critical failures from occurring:

RAID Spare Pool

Physical drives marked as a spare will automatically be added to redundant RAID array (levels 1, 10, or 5) whenever there is a disk failure. Enabling this feature minimizes the chances of data loss since it reduces the time an array is in critical status.

Add/Remove Spare disks:

Using WebGUI:

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.**

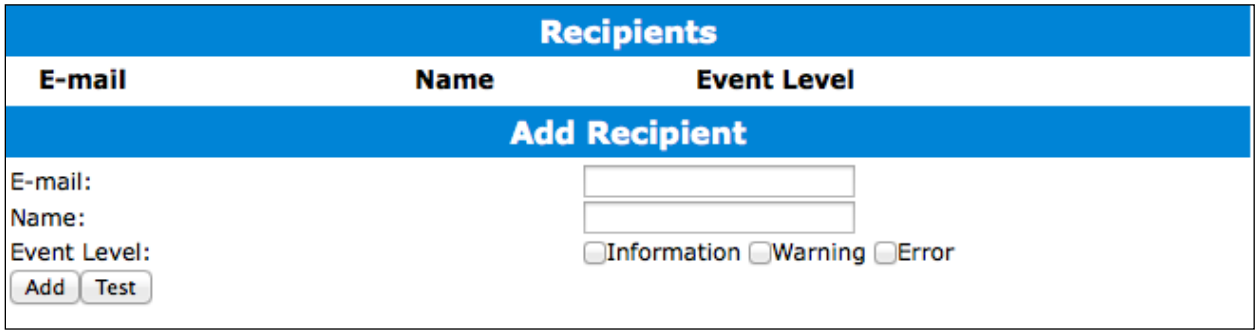
Email Notifications

When enabled, all added recipients will receive an email notification for any event log entries. (More information about events refer to pg. 27)

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**, refer to your ISP if you have a specific SMTP port.

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

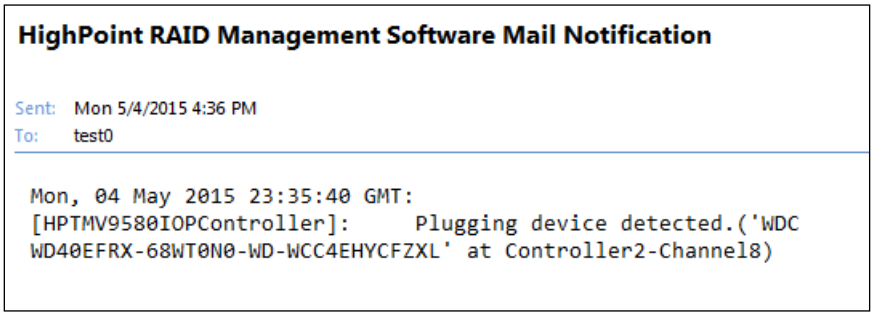
Adding Email Recipients



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: event log email message.

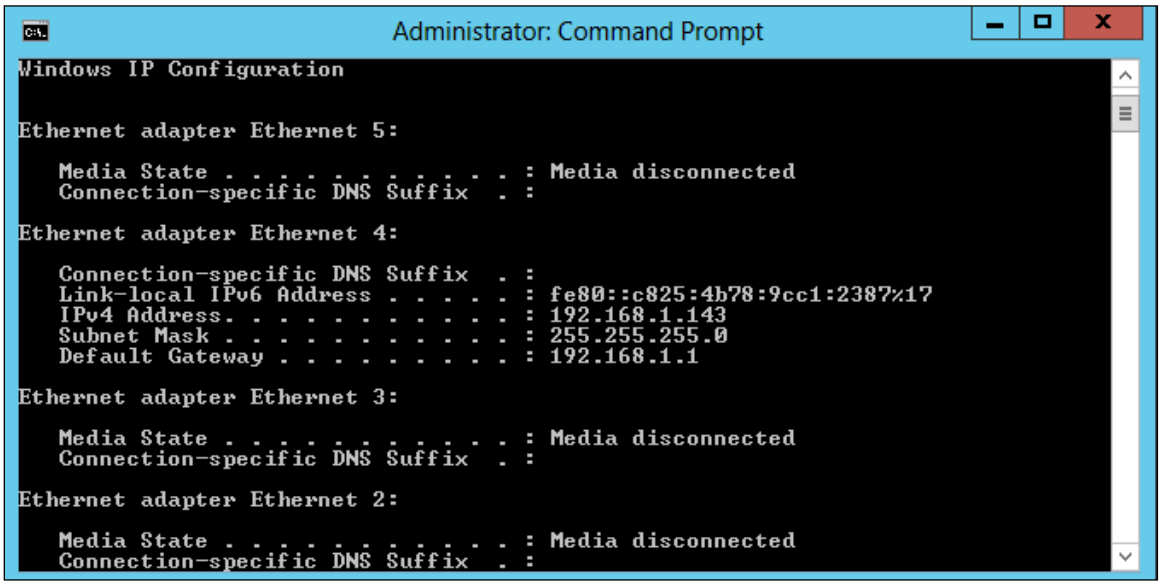
WebGUI Remote Login

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 **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.



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

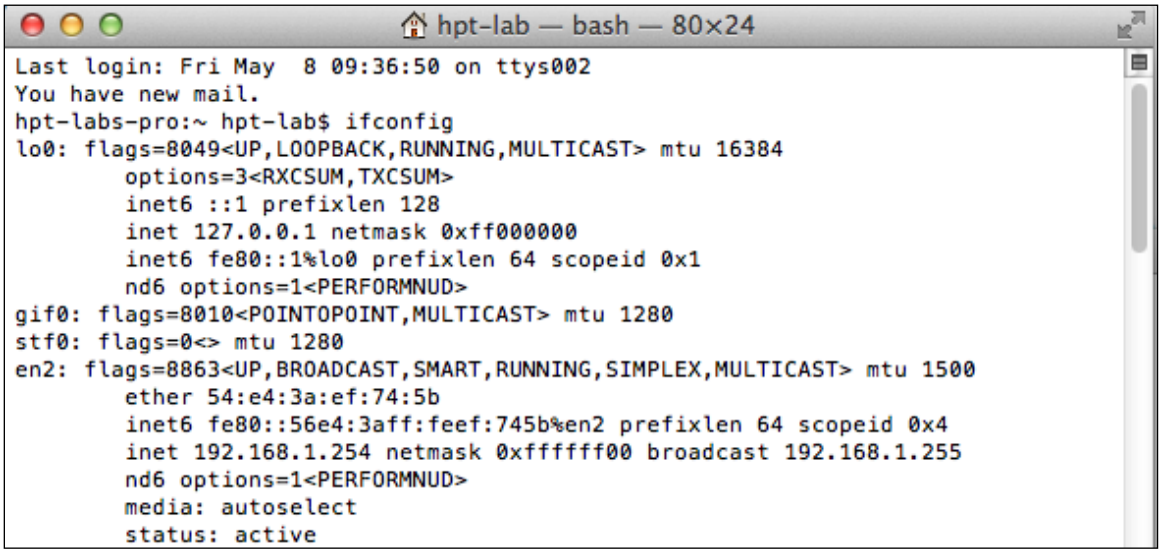
Note: Make sure **Restrict to localhost access** is **disabled** in WebGUI **Setting** (Refer to setting)

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).

For **Mac** Users:

1. Open a **terminal** window on the host computer (computer that is connected to the RocketStor 6414VS enclosure.)
2. Type `ifconfig`.
3. Look for the connection that has **status**: **active**

4. Write the IP address located after **inet**:



Example: en2 has active status, the IP is 192.168.1.254

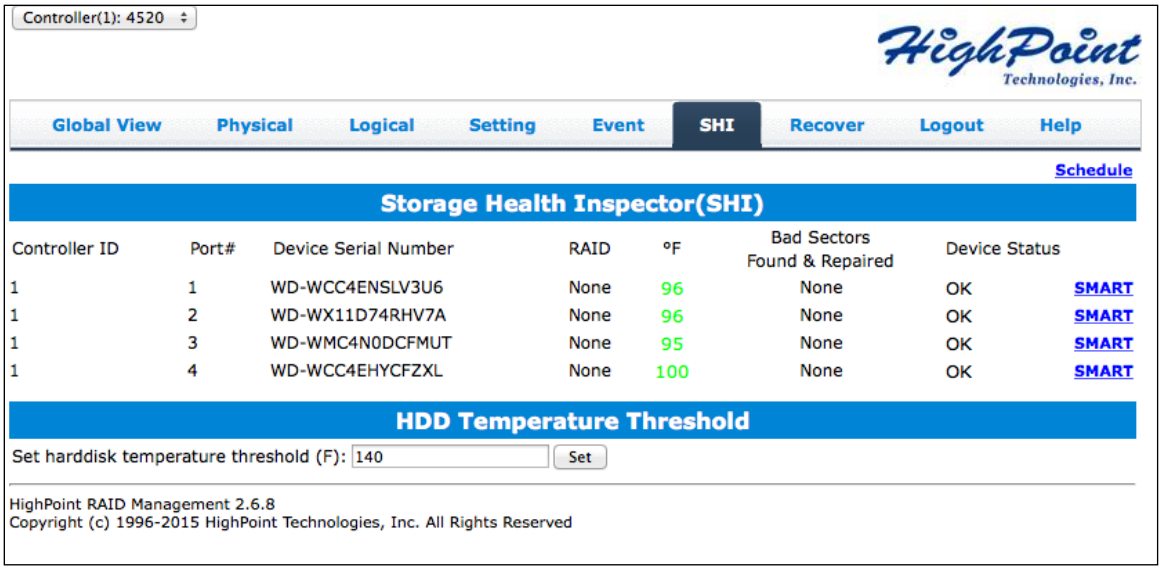
Storage Health Inspector (SHI)

The Storage Health Inspector (SHI) monitors each individual disk's health. Monitoring disk SMART attributes can prevent critical RAID failures from occurring.

This section contains the following:

- Enabling SMART Monitoring
- Disabling SMART Monitoring
- Changing HDD Temperature Threshold

Enabling SMART Monitoring



To access the 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.

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.

Changing HDD Temperature Threshold

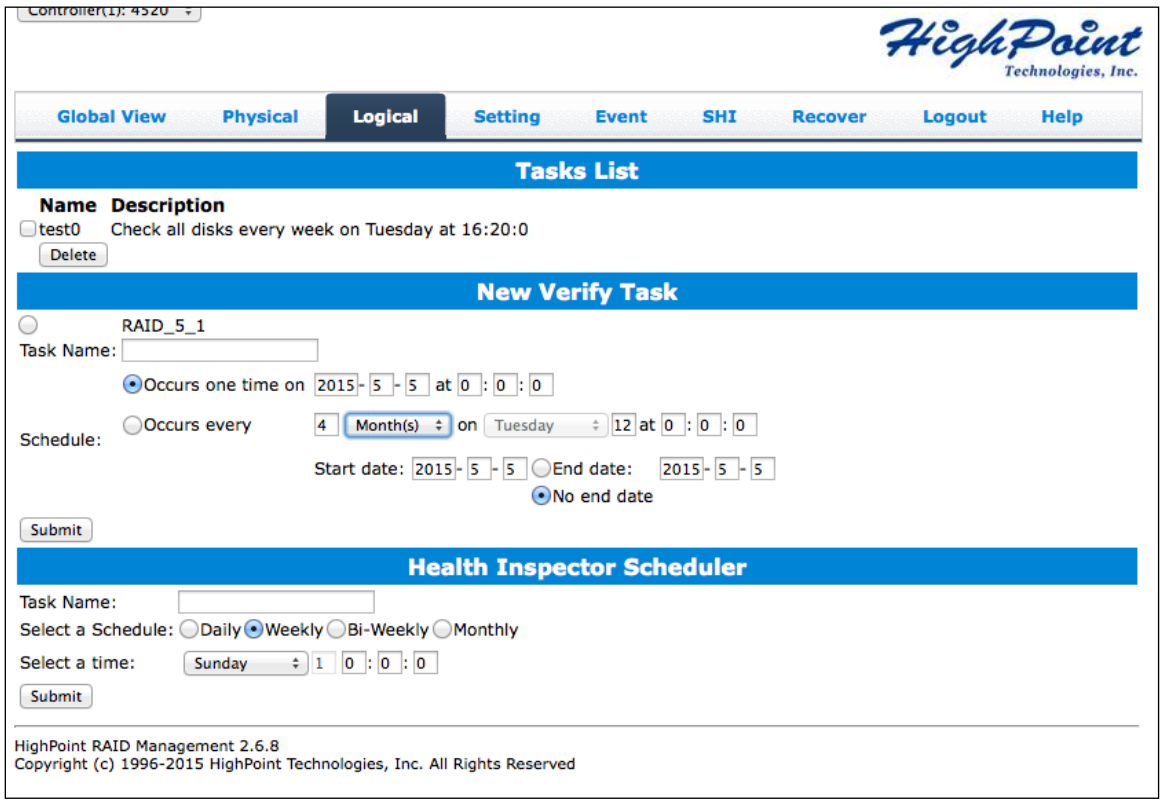
To ensure hard disk temperatures remain within safe operating temperatures, enable Storage Health Inspector to monitor disk temperatures. In **SHI**, you can set a threshold

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.**

Utilizing the Health Inspector Scheduler

The **Health Inspector Scheduler** (**HIS**) enables you to periodically check your disk/arrays to ensure they are functioning optimally.



Creating a New Verify Task in HIS

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.**

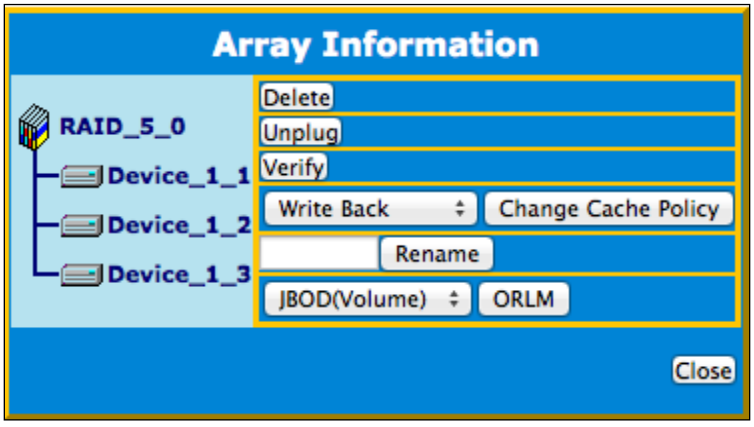
Note: New Verify Task box only appears if you have normal status arrays. If you have a critical array, New Rebuild Task will replace New Verify Task.

RAID Expansion (OCE/ORLM)

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:

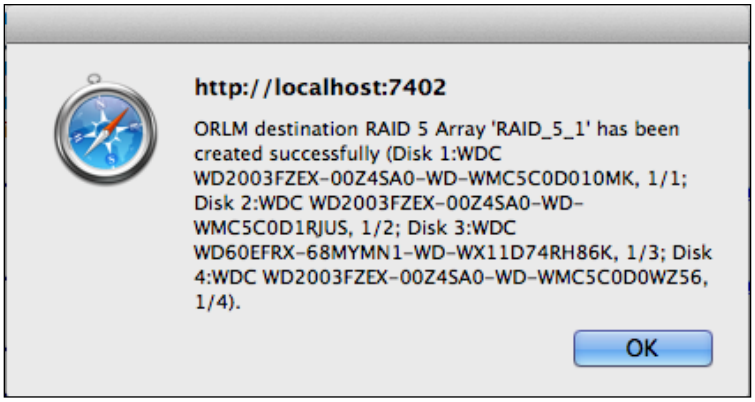
1. Log in WebGUI
2. Select desired controller from drop down menu on top left
3. Click **Logical**
4. Click **Maintenance** for the array you want to change
   - Select a **different** RAID level to **Migrate**
   - Select the **same** RAID level to **Expand**



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.



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

Troubleshooting - Hardware

If you face any hardware related issues involving the RocketStor 6414S enclosure, disk drives or RAID controller, refer to the following sections for troubleshooting tips. For more assistance, submit a support ticket at www.highpoint-tech.com/websupport.

Enclosure Mute Button

The mute button on the back will mute the alarm for enclosure related issues such as enclosure FAN or TEMPERATURE failures. Failures associated with the RAID controller will trigger the RAID card alarm, and cannot be muted with the enclosure mute button.

LED Activity

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

Table 1. LED Status Information

LED Status	Interpretation
STABLE GREEN	• Disk is detected and connection has been made
BLINKING **BLUE**	Disk is in use and performing I/O activity such as: • Rebuilding an array • Verifying data integrity • Transferring data
STABLE BLUE	• Enclosure is properly powered
UNLIT	• Unit is powered OFF • Disk tray is empty • No disk I/O occurring

Table 2. LED Diagrams

	Icon	Normal	Faulty
Disk Tray Top LED		• When powered on, the LED will be a STABLE GREEN	N/A
Disk Tray Bottom LED		• When disk is busy, LED will be BLINKING BLUE	N/A
Power LED		• When enclosure is powered on LED will be SOLID BLUE • Power LED will be UNLIT if not connected to a running host system	N/A

Table 3. LED Reference Chart

	Present	**Active**	**Failed**	**Identify**
Disk Tray	GREEN	BLUE	N/A	N/A
Enclosure LEDs	BLUE	N/A	N/A	N/A

Present – Indicates that the disk is present and available.
Active – Indicates the disk is performing disk I/O

Failed – N/A
Identify – N/A

Replacing a Failed Disk

When a disk in your array fails it is important to get it replaced or rebuilt as soon as possible to prevent any data loss.

1. Identify the faulty disk.
   - Log in to WebGUI and check the **Logical** Tab.
2. Once disk has been identified press the disk tray blue tab and slide the failed drive out.
3. Replace the failed drive with a new drive.
4. If auto rebuild is **enabled**, the rebuild process should start immediately.
5. If auto rebuild is **disabled**, click **rescan** on the left panel to initiate rebuilding.

Troubleshooting - Software

If you face any software related issues involving the HighPoint RAID Management (WebGUI), refer to the following sections for troubleshooting tips. For all other problems, submit a support ticket at www.highpoint-tech.com/websupport.

WebGUI – Connection cannot be established

1. Check the connection of the card with its PCI Express slot. (PCIe 2.0 x4 for RocketRAID 644LS)
2. Check and make sure the cables are not faulty.
3. Check Device Manager (Windows) or System Report (Mac) to verify the device and drivers are installed and detected by the OS
   a. **For Windows Users**:
      - Open Device Manager.
      - Click on the Storage Controller tab.
      - Check to see if RocketRAID 644LS RAID Controller is listed.
      - If RocketRAID 644LS RAID Controller is not listed, check to see if RAID Controller is under Unknown devices.
      - If RAID Controller is under unknown devices, re-install RocketRAID drivers.
      - If no RAID Controller is present, recheck your hardware and cables.
   b. For Mac Users:
      - Click the Apple Icon on the menu bar.
      - Click About this Mac > System Report.

- Click PCI.
- Check to see the **Type**: **RAID Controller** and **Driver Installed: Yes.**
- If Driver Installed is **No**, re-install the drivers.
- If no RAID controller is present, recheck your hardware and cables.

Troubleshooting – RAID

If you face any RAID related issues involving your RAID array, refer to the following sections for troubleshooting tips. For all other problems, submit a support ticket at www.highpoint-tech.com/websupport.

Critical Arrays

When your disk is 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	• Unplugging disk that is part of an array • Bad sector detected on a disk part of the array • Unrecoverable data during rebuilding • Defective port or cable interrupts rebuilding process

To recover from this situation,

1. It is recommended to backup your existing data if accessible.
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 you enable auto-rebuild setting and you simply reseated the faulty disk. ***Note***: Click **Rescan** if array still does not rebuild automatically.
   - (**Note**: When replacing with a new disk, make sure the new disk capacity is equal to or greater than the faulty disk capacity. Also make sure previous RAID configurations on the replacement disk are deleted.)
4. Once a new disk is added, add the new disk into the critical array.
   - Log in to WebGUI.
   - Click **Logical** Tab.
   - Click **Maintenance** > **Add disk** > select the appropriate disk.
5. Rebuild should start automatically.

- 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.

Rebuild failed

Rebuilding operations may fail due to bad disk sector errors (bad sector errors will be noted in 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 faulty disk was removed

If this is the case, check to make sure you removed the correct 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 RocketStor 6414S Enclosure.
3. Place all disks back to original configuration.
4. Boot up PC.
5. Once array is back to critical status, identify the correct disk and replace it.

Disabled Arrays

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

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 on the recover list. The goal of using recover is to get the RAID status back to critical/normal, allowing you to access and back up your data.

Example: RAID 5 Disabled Array:

Recover with RAID Maintenance

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

Recover RAID with Recover Tab

Before using the Recover tab to recover your array, check to see if the RAID array is listed in your **Recover List**. Once you have confirmed the RAID array is there, proceed to delete the disabled array.

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

Frequently Asked Questions

This section covers some commonly asked questions:

Recovering your Password

For **Windows** Users:

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

For **Mac** Users:

1. Open **Terminal**
2. Type or navigate to cd **/usr/share/hpt**

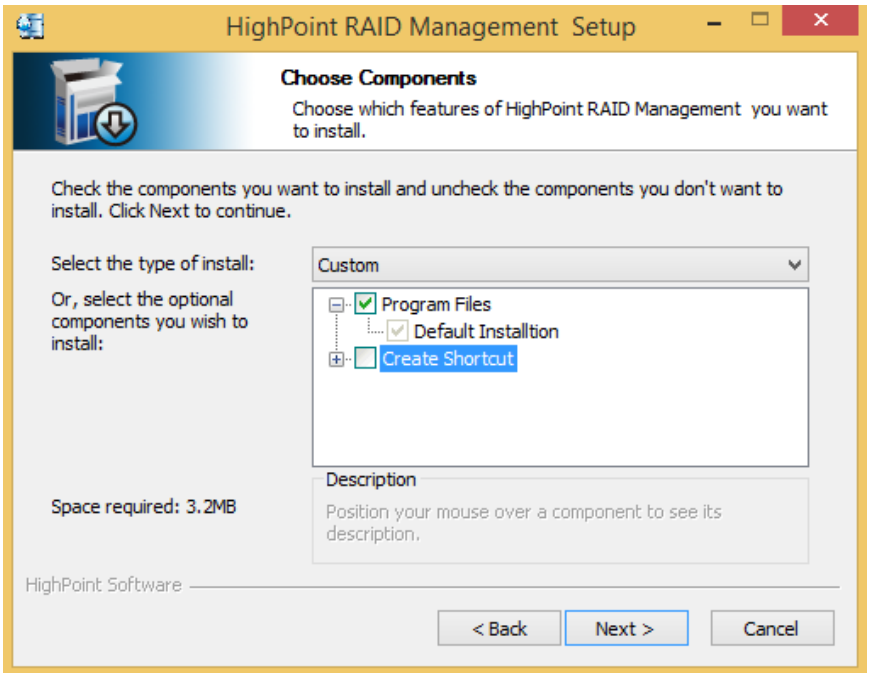
3. Type rm **hptuser.dat**, to remove the file. (***Note: must*** be root user mode to remove this file)
4. Reboot

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 the RocketStor 6414S fails or you wish to use another RAID controller, the RAID configuration data can still be read by another HighPoint card.

Stuck WebGUI Installation

Solution: During the WebGUI installation, uncheck Create a Desktop Shortcut



Appendix A: Navigating the HighPoint WebGUI

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

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

How to Login HighPoint WebGUI

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

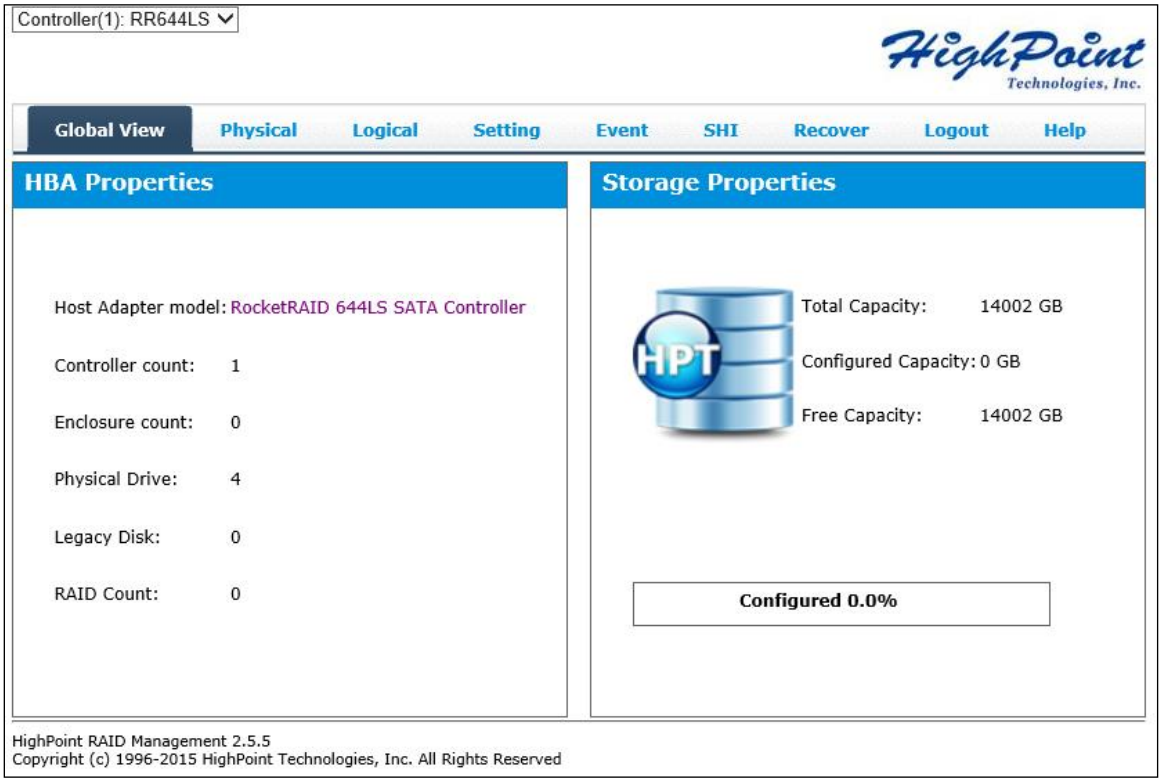
- Double clicking on the **HighPoint RAID Management** icon created on your desktop
- Opening your preferred web browser and typing **http://localhost:7402** in the address bar.

The default username and password to login is:

Username: RAID
Password: hpt

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

Appendix A-1: Global Tab



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).

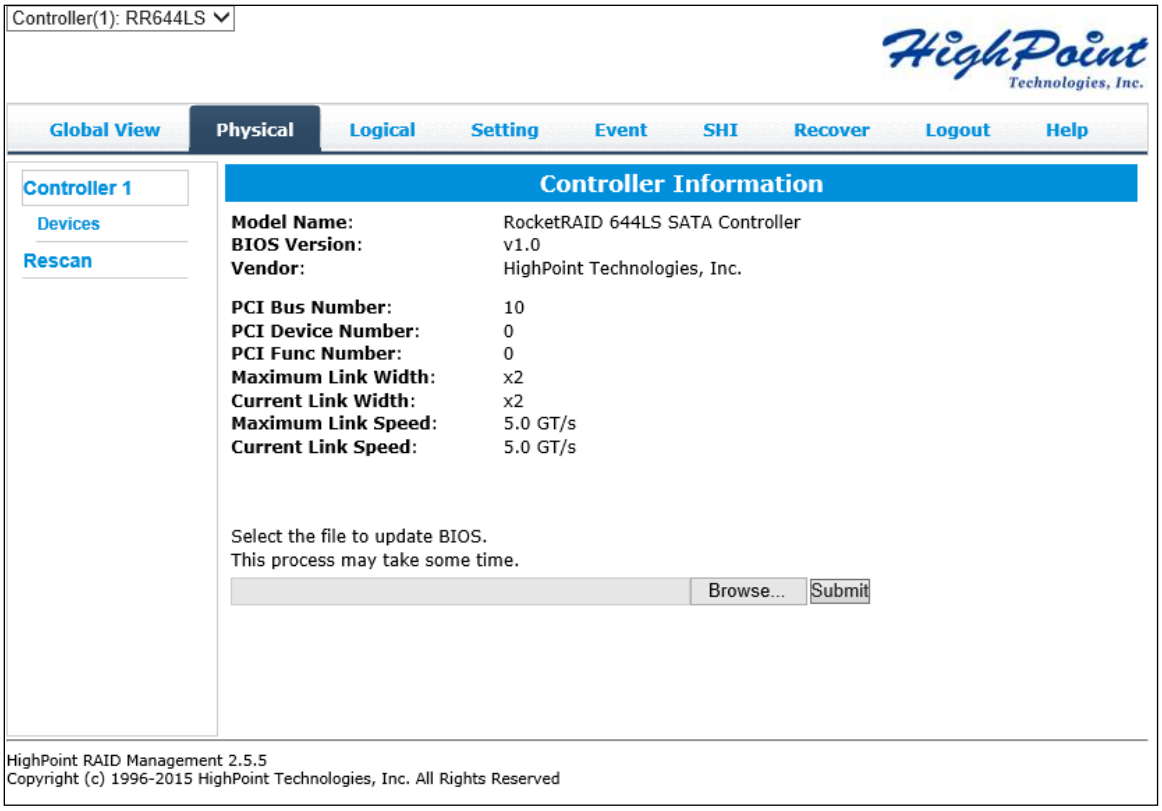
HBA Properties

- **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.

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

Appendix A-2: Physical Tab



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.

Controller Information: Lists the controller model name, BIOS version, and vendor.

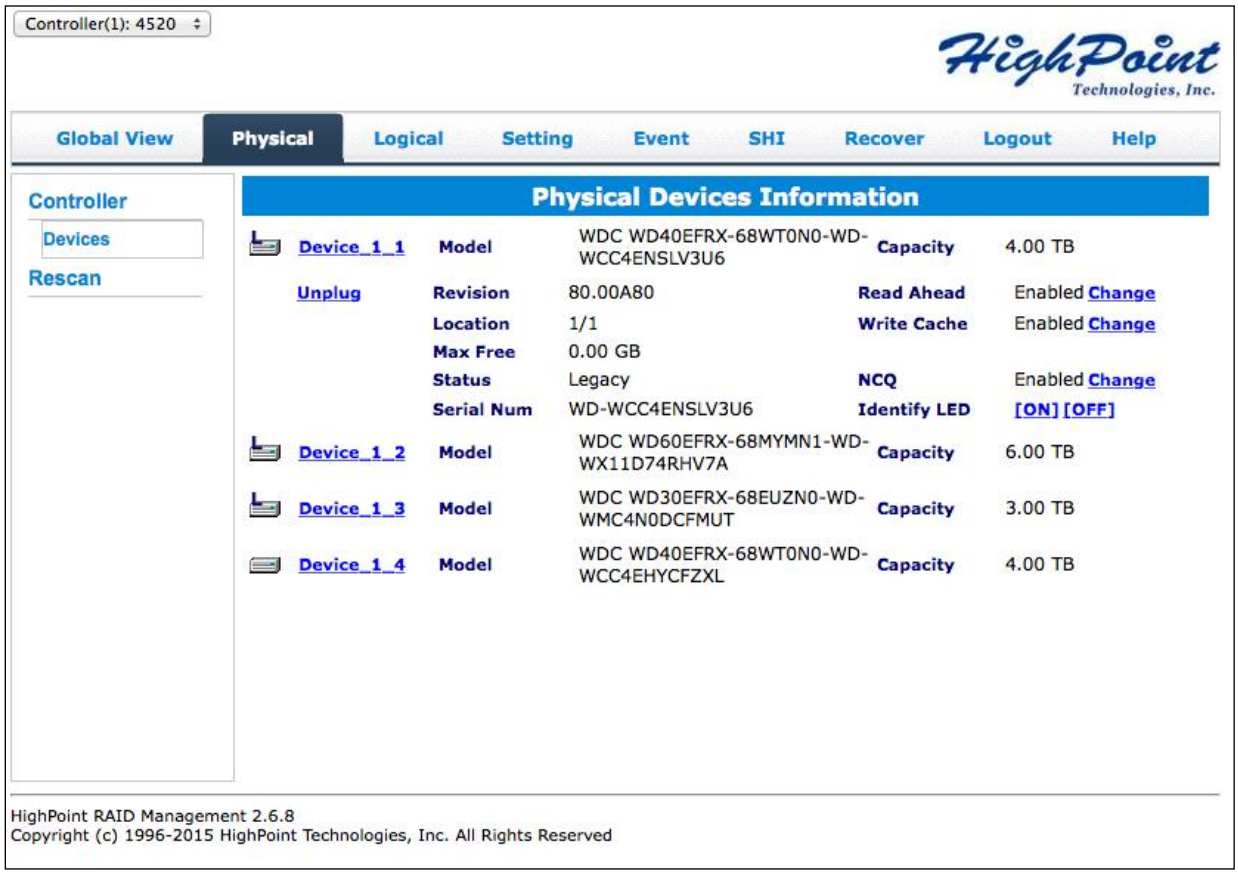
- Model Name: RocketRAID 644LS SATA Controller
- BIOS Version: v1.0
- Vendor: HighPoint Technologies, Inc.

Extended Information: Gives you additional information concerning the HBA (**H**ost **B**us **A**dapter) in the enclosure

- **IOP Model**: IOP chip model number
- **CPU Temperature**: Displays computer temperature in Celcius (℃).
- **Board Temperature**: Displays the board temperature in Celcius (℃).
- **SDRAM Size**: SDRAM size of the HighPoint controller card
- **Battery Installed**: Battery Backup Unit (**Not Applicable** for RocketRAID 644LS)
- **Firmware Version**: Firmware version of the HBA
- **SAS address**: the SAS address

Update Firmware: The RocketRAID 644LS has installed Quick BIOS so there is no need to update BIOS.

Physical Devices 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, 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** – N/A
- **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.

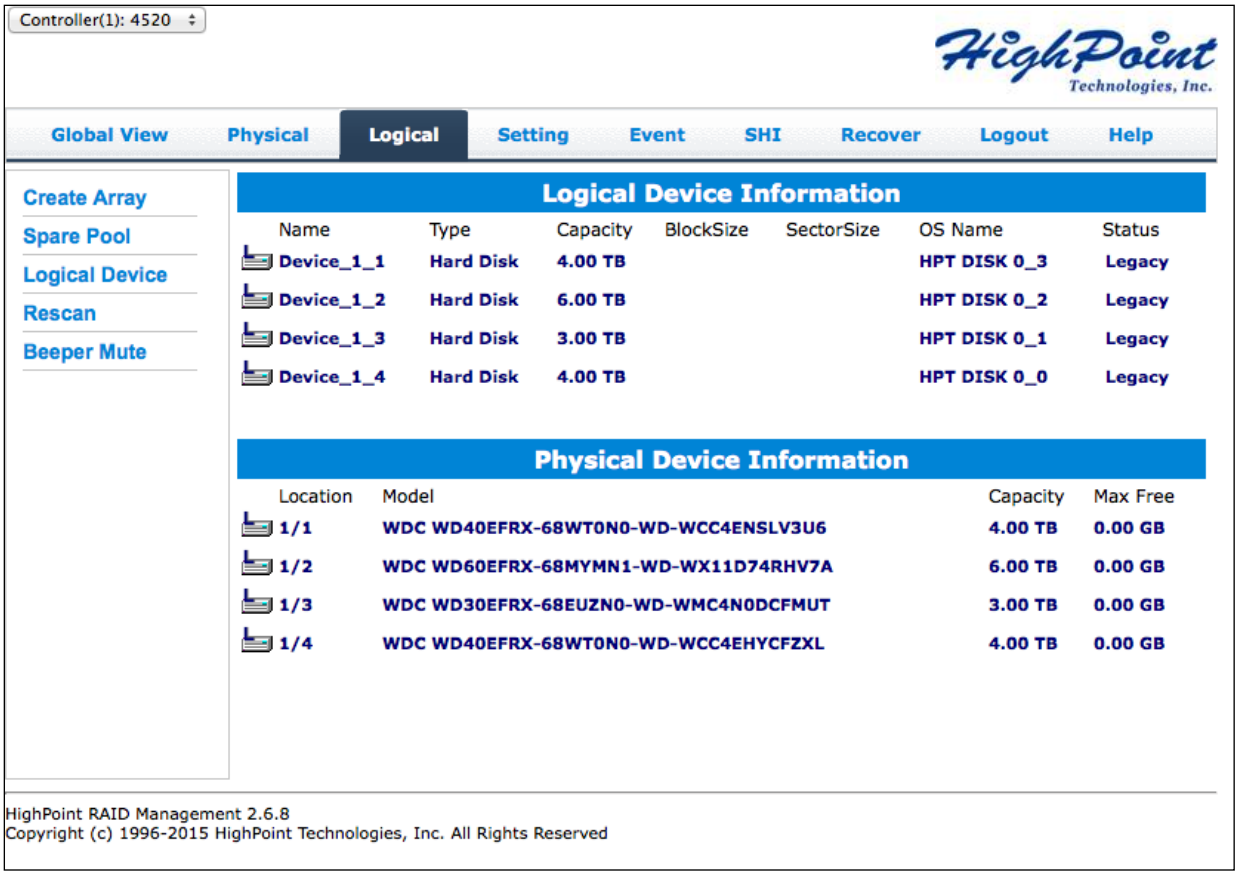
Write Cache
Enabling write cache will speed up write operations.

NCQ (Native Command Queuing)
A setting that allows disks to queue up and reorder I/O commands for maximum efficiency.

Identify LED
N/A

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.

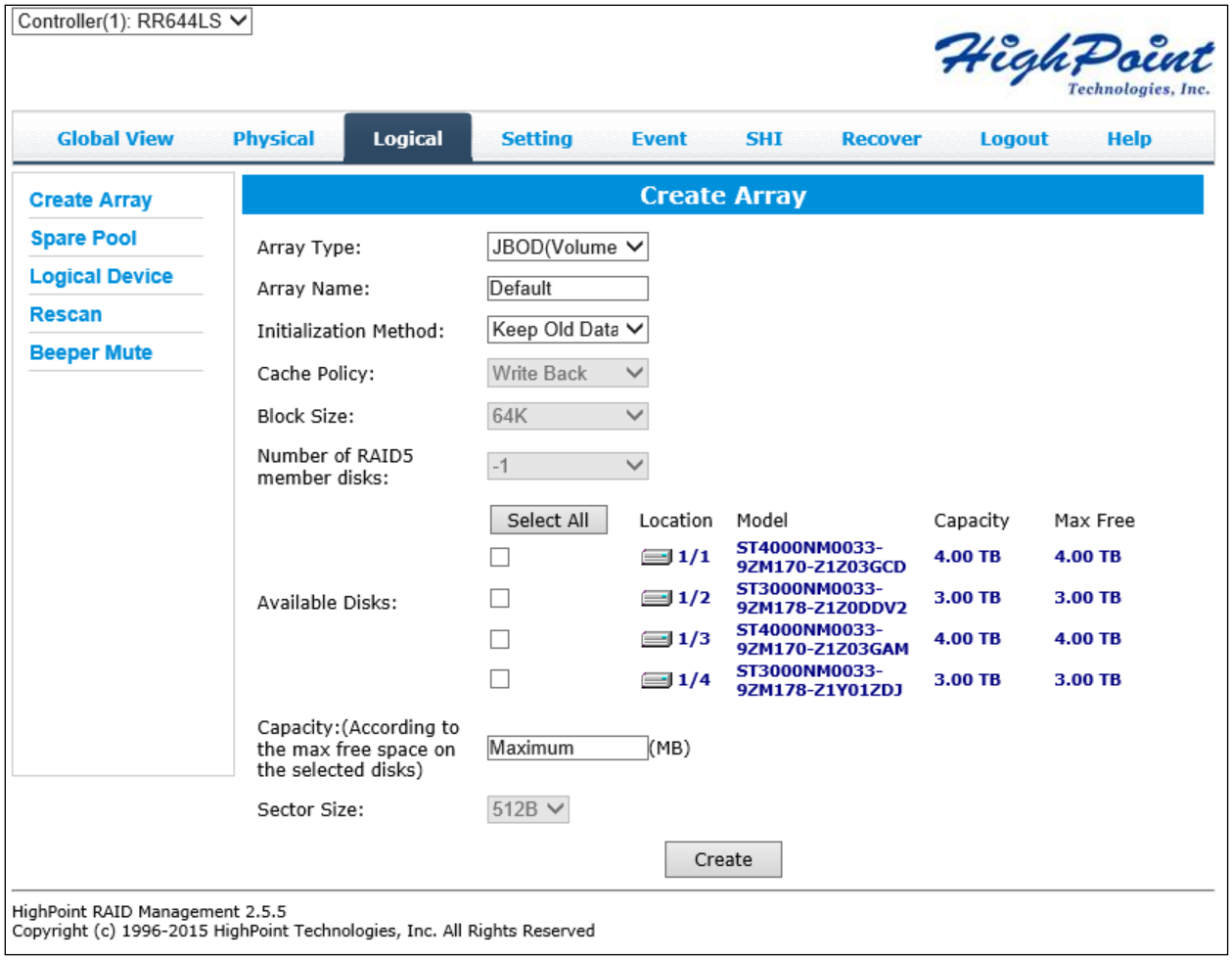
Appendix A-3: Logical Tab



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

An array is a collection of physical disks that will be seen as one virtual drive by your Operating System (OS). The RocketStor 6414VS has a RocketRAID 644LS controller capable of creating the following array types



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

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:

- **Keep Old Data**: This option skips the initialization process and all data on each

physical disk of the array will be untouched.

- **Quick Init**: Grants immediate access to the array volume. This option will delete previous user data, but will not build parity. Recommended for testing purposes only or when new disks are used. **Not recommended** for RAID 5

- **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: Foreground initialization takes a significant amount of time (approximately 2 hours per 1 TB).

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)

A block size of 64 KB is recommended since it gives balanced performance for most applications.

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.

Example Capacity calculation:

A RAID 5 organizes data in the manner shown below. All parity data will become unusable for the user and not included in the total disk capacity.

Disk 1	Disk 2	Disk 3	Disk 4

Data 1	Data 2	Data 3	Parity
Data 4	Data 5	Parity	Data 6
Data 7	Parity	Data 8	Data 9
Parity	Data 10	Data 11	Data 12

Therefore, RAID 5 capacity will be [SMALLEST DISK CAPACITY] * (number of disks – 1).

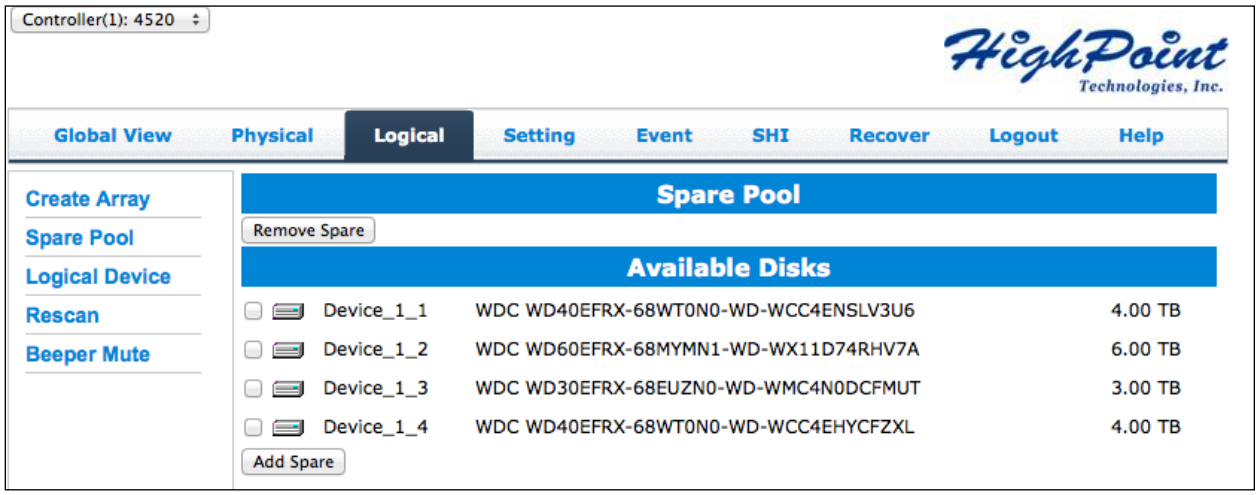
Sector Size (Default: 512B)

This option is irrelevant for Windows XP 64 and later. Current OS already support larger volumes, and introduce a partitioning method known as GPT (GUID partition table). This option, also known as VSS (Variable Sector Size) allows you to specify the sector size of the array, for use with older Windows Operating Systems.

Spare Pool

Spare disks are physical disks that will immediately replace critical disks in an array. Only redundant RAID arrays (RAID 1, 5, and 10) support spare drives.

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.



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**

Logical Device Information

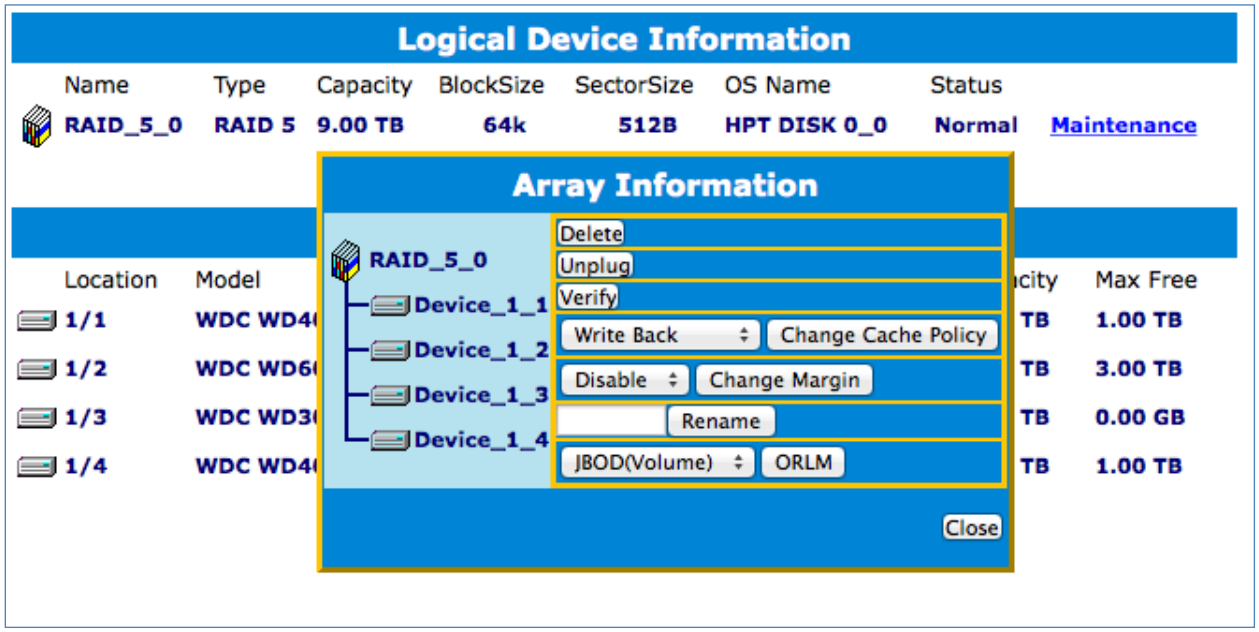
Logical device tab is the default page upon clicking the Logical tab of the WebGUI. This page contains information about your RAID arrays and individual disks your system detects.

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.

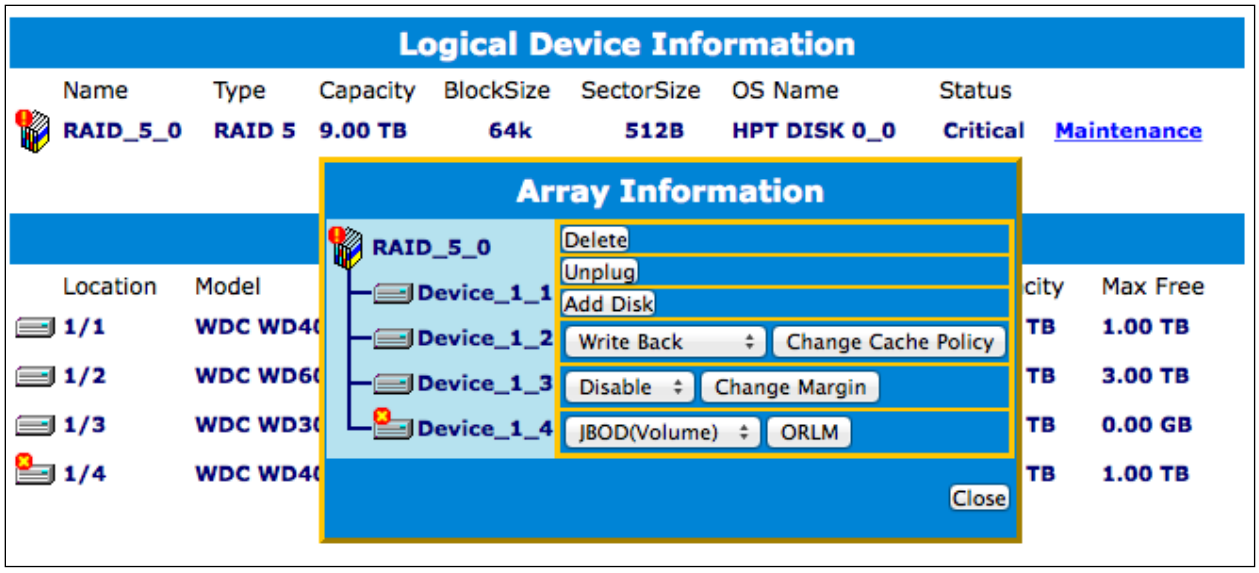
Normal Status



Maintenance options for Normal Arrays.

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 – **O**nline **C**apacity **E**xpansion / **O**nline **R**AID **L**evel **M**igration

Critical Status



Maintenance options for Critical Arrays.

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

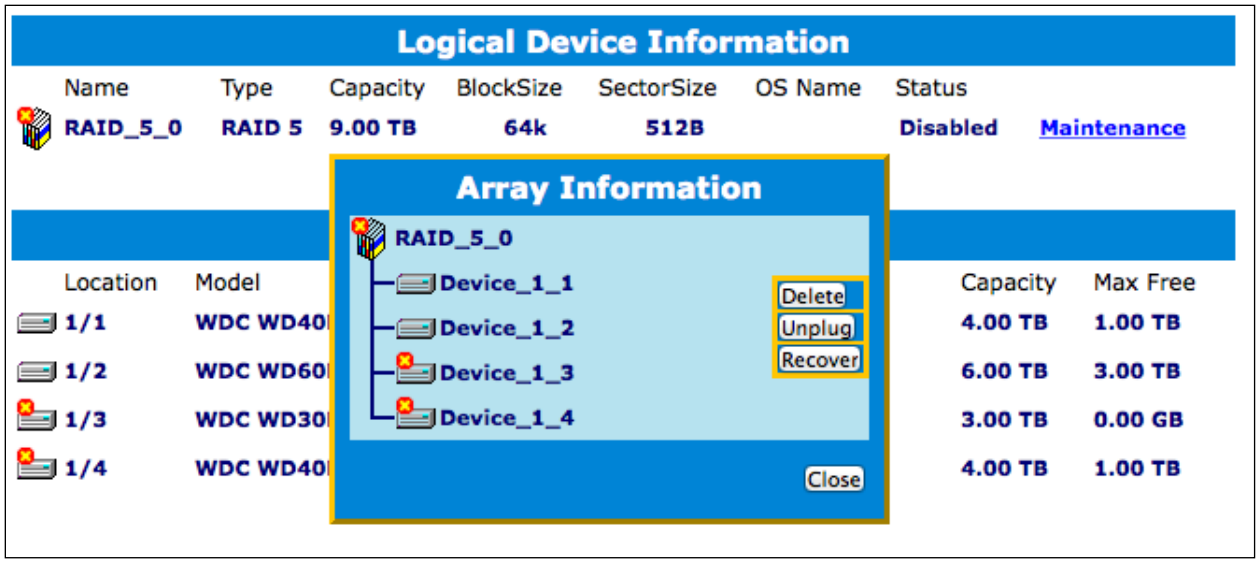
Once array status changes to critical, the faulty disk will be taken offline and you can either:

- 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



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 the parity data to rebuild upon.

Your options in **Maintenance** of a **Disabled** array are:

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

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.

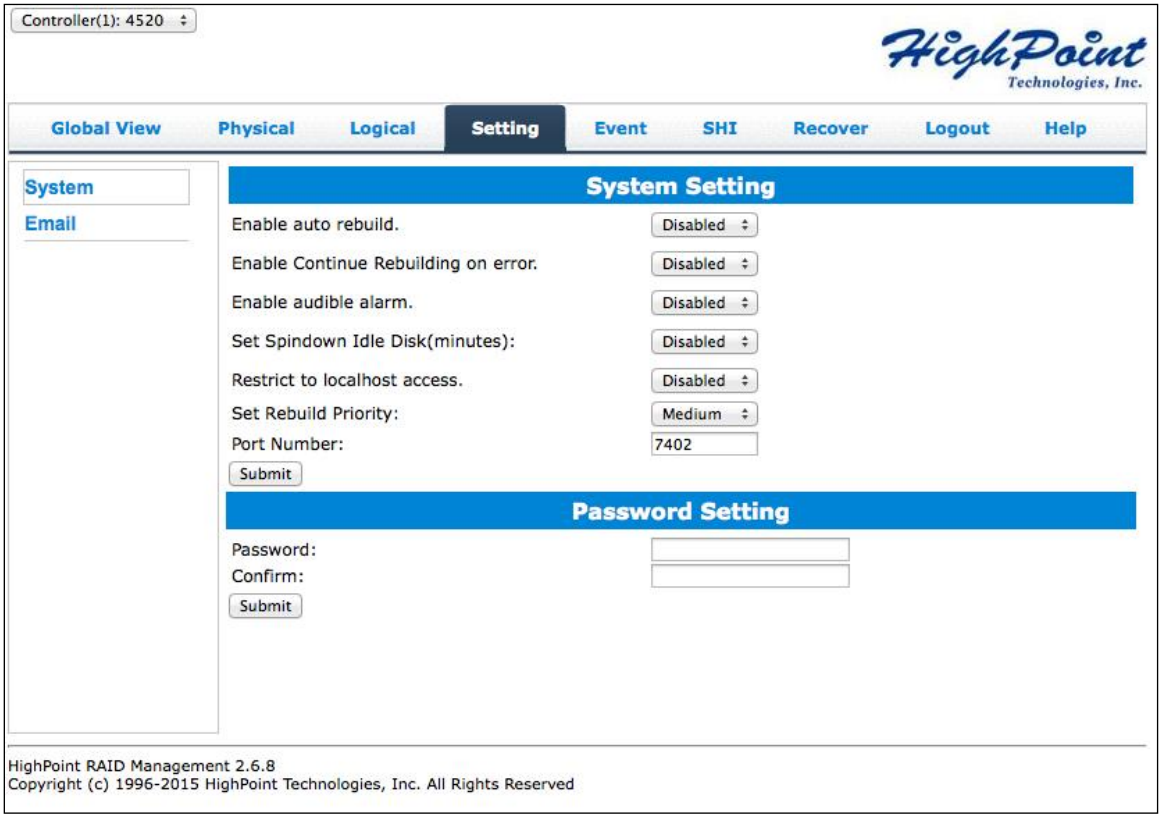
Beeper Mute

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** in WebGUI will mute the sound immediately. ***Note***: Clicking **Beeper Mute** does not permanently mute the alarm. In order to permanently mute the alarm, go to **Setting** > **Enable audible alarm** > **Disabled**.

Appendix A-4: Setting Tab



System 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 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.

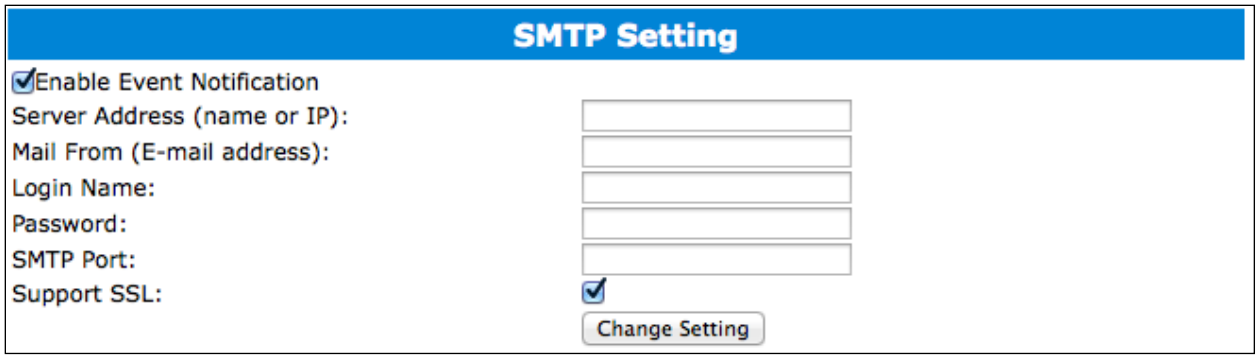
Email Setting

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

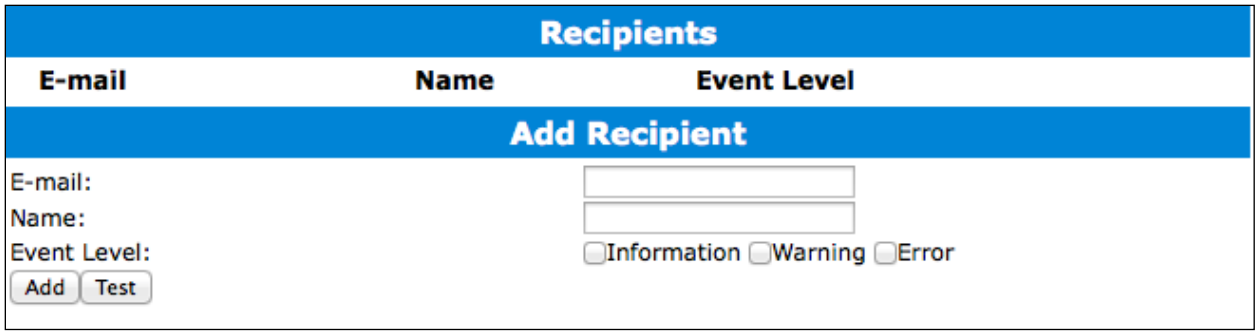


To set up email alerts:

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**, refer to your ISP if you have a specific SMTP port.

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

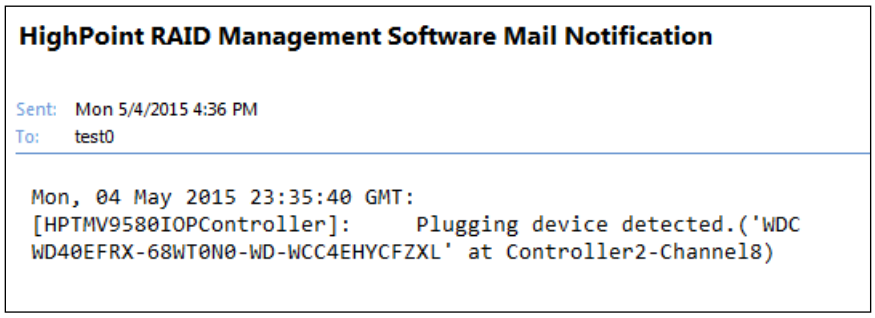
How to Add Recipients



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

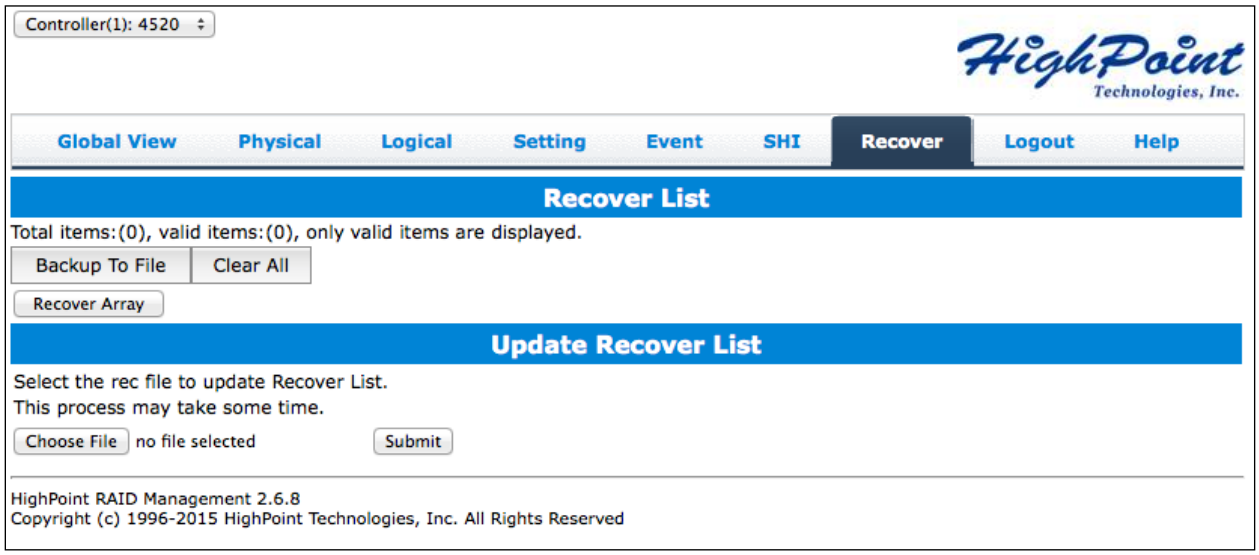
1. Type the email of the recipient in the **E-mail** text box
2. Type the name of the recipient in the **Name** text box
3. Check which type(s) of events will trigger an email in the respective **Event Level** check boxes
4. (**Optional**) Click **test** to confirm settings are correct by sending out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



Example: event log email

Appendix A-5: Recover Tab



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**

Appendix A-6: 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

Table 4. Event Log Icon Guide

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

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

Appendix A-7: SHI (**S**torage **H**ealth **I**nspector)

- 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.

Appendix B: 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.
	**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 is 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 disk 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.

Appendix C: RAID Level Quick Reference[1]

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 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

[1] Refer to the RAID controller product specifications for supported RAID levels.

Help

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.

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://highpoint-tech.com/PDF/Compatibility_List/RocketRAID_600_2700_3600_and_4500_Series_RAID_HBA_Hard_Drive_Compatiblity_List.pdf

Contacting Technical Support

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

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