HighPoint Technologies, Inc.

HighPoint NVMe RAID Management Guide

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start=mm/dd/vvvv end=mm/dd/vvvv time=hh·mm·ss	51
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HighPoint RAID Management Software

Your Choice – Graphical or Text-only interfaces

HighPoint understands that one size doesn't fit all - when it comes to maintaining critical storage configurations, each customer has specific needs and preferences. We have developed both graphical and text-based management interfaces for NVMe products. To simplify installation and upgrade procedures, both interfaces are packaged into a single download, and are available for each operating system platform.

The following is a list of supported NVMe products.

Supported Controller	SSD7540
	SSD7505
	SSD7502
	SSD7140A
	SSD7204
	SSD7202
	SSD7104
	SSD7104F
	SSD7101A-1
	SSD7105
	SSD7749M
	SSD7749E
	SSD7580B
	SSD7580A
	SSD7184
	SSD7180
	SSD7120
	RocketAIC 7749EW Series
	RocketAIC 7540HW Series
	RocketAIC 7505HW Series
	RocketAIC 7502HW Series
	RocketAIC 7140AW Series
	RocketAIC 7105HW Series
	RocketAIC 7749EM Series
	RocketAIC 7540HM Series
	RocketAIC 7505HM Series
	RocketAIC 7204HM Series
	RocketAIC 7202HM Series
	RocketAIC 7140AM Series
	RocketAIC 7105HM Series
	SSD6540
Supported Enclosure	SSD6540M
Supported Enclosure	SSD6444
	SSD6780A

Both management interfaces share universal layouts across all major operating systems, and can be administered locally or remotely via an internet connection. – if you are comfortable with the Windows

release, you will have no problem managing NVMe RAID configurations installed for a Linux distribution.

The Web RAID Management Interface (**WebGUI**), is a simple, and intuitive web-based management tool available for Windows /Linux /Mac operating systems. It is an ideal interface for customers unfamiliar with RAID technology. The Wizard-like Quick Configuration menu allows even the most novice user to get everything up and running with a few simple clicks. Experienced users can fine tune configurations for specific applications using the Advanced Options menu.

The **CLI** (command line interface) is a powerful, text-only management interface designed for advanced users and professional administrators. The universal command lines work with any platform, and are shared across our entire product line. Comprehensive user guides are available for the CLI, and are included with the most recent product updates available from the Software Updates section of the product category webpages.

Using the HighPoint RAID Management (WebGUI) Software

This guide provides an overview of the Web-RAID Management graphical user interface, also known as the WebGUI. The WebGUI is an intuitive, yet comprehensive management tool designed for users of any experience level.

Starting the WebGUI

How to login WebGUI in Windows/Mac

Double click the Desktop ICON to start the software using the system's default web browser. It will automatically log-in to the WebGUI.



The password can be set after the first log-in. To change the password, select **Setting>Password Setting** from the menu bar.

Windows:



Mac:



How to login WebGUI in Linux

Enter <u>http://127.0.0.1:7402</u> into the **browser** to log into the **WebGUI**, 7402 is the WebGUI's Port Number, which can be modified.



The password can be set after the first log-in. To change the password, select **Setting>Password Setting** from the menu bar.



Verify the Controller Status

- 1. The **Global View** Tab will display the overall status of the controller.
- 2. RAID configurations are listed under Logical Device Information.
- 3. The individual NVMe SSDs are listed under Physical Device Information.



Note: the picture is only for reference, please make the object as the standard.

Creating an Array

Single controller to create an array

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

Example screenshot

	1				Hig	hPoint Technologies, Ind
Global View	Physical Logic	Setting	Event	SHI Help		
Create Array			Creat	te Array		
Spare Pool	Array Type:	RAID 0	~]			
Logical Device	Array Name:	Default	-			
Rescan	Initialization Method:	Keep Old Data	-			
	Cache Policy:		~			
	Block Size:	512K	~			
		Select All	Location	Model	Capacity	Max Free
			1/E1/1	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB
	Available Disks:		1/E1/2	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB
			1/E1/3	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB
			1/E1/4	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB
	Capacity: (According to the max free space on the selected disks)	Maximum	(MB)			

Note: the picture is only for reference, please make the object as the standard.

Using the Cross-Sync feature to create an array

Note: This function is only supported by the SSD7101A-1, SSD7104, SSD7105, SSD7120, SSD7202, SSD7505, SSD7749M, SSD7749E controllers, and the RocketAIC 7505HW, 7540HW and 7749EW series NVMe drives.

For more information about Cross-Sync, please submit a Support Ticket via our <u>Online Support Portal</u>, or contact sales@highpoint-tech.com

- 1. Open the WebGUI.
- 2. Select the appropriate controller using the drop-down menu found in the upper left-hand corner of the interface.
- 3. Click the Logical tab.
- 4. Click Create Array it should recognize the SSD's attached to both cards.

Example screenshot

Global View	Physical Logica	I Setting	Event	SHI	Help	0.000					
Create Array	Logical Device Information										
Spare Pool Logical Device	Name Device_1_E1_1	Type Hard Disk	Capacity Blo 1.02 TB	ockSize	SectorSize	DS Name HPT DISK 0_0	Status Legacy				
Rescan	Device_1_E1_2	Hard Disk	1.02 TB			HPT DISK 0_1	Legacy				
	Device_1_E1_3	Hard Disk	512.11 GB			IPT DISK 0_2	Legacy				
	Device_1_E1_4	Hard Disk	512.11 GB			IPT DISK 0_3	Legacy				
	Device_1_E2_1	Hard Disk	512.11 GB		1	IPT DISK 0_4	Legacy				
	Device_1_E2_2	Hard Disk	512.11 GB		1	HPT DISK 0_5	Legacy				
	Device_1_E2_3	Hard Disk	512.11 GB		1	IPT DISK 0_6	Legacy				
	Device_1_E2_4	Hard Disk	512.11 GB			IPT DISK 0_7	Legacy				
	Dhucical Davica Information										
	Location M	odel	Sical Devic	C IIIIO	Capaci	tv Max	Free				
	1/E1/1 Sa	amsung SSD 970	PRO 1TB		1.02 T	в 0.00	GB				
	1/E1/2 Si	amsung SSD 970	PRO 1TB		1.02 T	B 0.00	GB				
	1/E1/3 Se	amsung SSD 970	PRO 512GB		512.11	GB 0.00	GB				
	1/E1/4 Sa	amsung SSD 970		512.11	GB 0.00	GB					
	└= 1/E2/1 Sa	amsung SSD 970		512.11	GB 0.00	GB					
	1/E2/2 Sa	amsung SSD 970		512.11	GB 0.00	GB					
	1/E2/3 Si	amsung SSD 970	PRO 512GB		512.11	GB 0.00	GB				
	1/E2/4 Si	amsung SSD 970	PRO 512GB		512.11	GB 0.00	GB				
Global View	Physical Logi	cal Settin	g Event	SH	II Help						
eate Array			Crea	nte Ari	ray						
are Pool	Array Type:	RAID 0	\sim								
gical Device	Array Name:	Default									
scan	Initialization Method:	Quick Init	\sim								
	Cache Policy:		\sim								
	Block Size:	512K	\sim								
		Select All	Location	Mod	el	Capacity	Max Free				
		\checkmark	1/E1/1	1 Sam PRO	sung SSD 970 1TB	1.02 TB	0.00 GB				
			➡ 1/E1/2	2 Sam PRO	sung SSD 970 1TB	1.02 TB	0.00 GB				
			➡ 1/E1/3	3 Sam PRO	sung SSD 970 512GB	512.11 GB	0.00 GB				
	Available Disks:	\checkmark	┣ <u></u> 1/E1/4	4 Sam PRO	sung SSD 970 512GB	512.11 GB	0.00 GB				
			1/E2/1	1 Sam	sung SSD 970 512GB	512.11 GB	0.00 GB				
			1/E2/2	2 Sam	sung SSD 970 512GB	512.11 GB	0.00 GB				
		\checkmark	1/E2/3	3 Sam	sung SSD 970	512.11 GB	0.00 GB				
			1/E2/4	4 Sam PRO	sung SSD 970 512GB	512.11 GB	0.00 GB				
	Capacity:										
	(According to the max free space on the selected disks)	Maximum	(MB)								
				Create							

Note: the picture is only for reference, please make the object as the standard.

5. You can view information about both controllers using the **Physical** tab. *Note:* The interface will refer to the controllers as "Enclosure 1" and "Enclosure 2".

Global View	Physical Logical	Setting Event SHI Help
Controller 1		Enclosure Information
Enclosure 1	Model:	SSD7202
	Vendor:	HighPoint
Devices	ID:	1
Enclosure 2	PCI Bus Number:	101
Devices	PCI Device Number:	0
	PCI Func Number:	0
Rescan	Current Link Width:	×8
	Current Link Speed:	8.0 GT/s

Array Type

This drop-down menu allows you to specify the RAID level. An array is a collection of physical disks that will be one virtual drive by your Operating System (OS).

The SSD7202 /7502 is capable of creating the following types of arrays:

- RAID 0 Striping
- RAID 1 Mirroring

The other NVMe products can create the following types of arrays:

- RAID 0 Striping
- RAID 1 Mirroring
- RAID10 Striping Mirrored array

Each RAID level has its pros and cons based on the application you use it for.

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.

- Keep Old Data: This option skips the initialization process and all data on each physical disk of the array will be untouched.
- Quick Init: This option grants immediate access to the RAID array by skipping the initialization process, but it will delete all data. Note: Skipping initialization is generally not recommended 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.

Note: Using a Samsung 970 EVO Plus 500GB as an example; RAID1 Initialization (Foreground) time is approximately 10 minutes. Initialization using the Background option would take 12 minutes to complete.

Background and Foreground Initialization

Foreground 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. Background 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.

Block Size (default: 512K)

Windows:

SSD7105/7202/7502/7505/7540/7580A/7580B/7749M/7749E/6780A/RocketAIC 7505HW /7540HW/7749EW: [supported block sizes: 64K/128K/256K/512K]

SSD7101A-1/SSD7120/7104/6444/6540/6540M/7204/7184/7180/7140A: [supported block sizes: 16K/32K/64K/128K/256K/512K/1024K]

Mac:

SSD7105/7502/7505/7540/7101A-1/7120/7104/6444/6540/6540M/7204/7140A/7749M/7749E/ Rocket AIC 7505HW/7540HW/7749WE: [supported block sizes16K/32K/64K/128K/256K/512K/1024K] Linux: SSD7105/7502/7202/7505/7540/7101A-1/7120/7104/6444/6540/6540M/7204/7184/7180/ 7140A/7580A/7580B/7749M/7749E/6780A/ RocketAIC 7505HW/7540HW/7749WE: [supported block sizes: 128K/256K/512K]

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 disk 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.

Capacity (Default: Maximum)

This section allows you to set the total amount of space you want the RAID array to use. 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 2 drives connected to the enclosure.
- The first drive is 6 TB, the second is 4 TB.
- After creating a RAID level 1 using both drives and maximum capacity, the first drive will have 2 TB, the second 0 TB of free capacity.
- The free capacity on the second drive can be used to create a separate array with other drives.

Delete an Array

Used to delete a created Array

- 1. Open the WebGUI.
- 2. Click the Logical tab \rightarrow Manintenance.

Global View	Physical L	ogical	Setting	Event	SHI	Help			
Create Array			Logio	cal Devic	e Info	rmatio	n		
Spare Pool	Name		Type Secu	red Capacity	BlockSize	SectorSiz	e OS Name	Status	
Logical Device	RAID10_0		RAID No 10 No	2.00 TB	512k	512B	HPT DISK 0_0	Normal <u>Maintena</u>	ance
Rescan	Member 1 of "RAID10 0	of "	RAID 1 No	1.00 TB		512B		Normal Maintena	ance
	Member 2 0 "RAID10_0	of "	RAID 1 No	1.00 TB		512B		Normal <u>Maintena</u>	ance
			Physi	cal Devi	ce Info	rmatio	n		
	Location	Model				Secured	Capacit	y Max Free	
	1/E1/1	Samsu	ng SSD 980 PRO) 1TB		No	1.00 TB	0.00 GB	
	🗐 1/E1/2	Samsu	ng SSD 980 PRC) 1TB		No	1.00 TB	0.00 GB	
	🚍 1/E1/3	Samsu	ng SSD 980 PRC) 1TB		No	1.00 TB	0.00 GB	
	= 1/F1/4	Samsu	ng SSD 980 PRC	1178		No	1 00 TB	0.00 GB	

3. Click **Delete** to delete the RAID array.

Global View	Physical	Logical	Setting	g Event	SHI	Help		
Create Array			L	ogical Devic	e Infor	rmatio	n	
Spare Pool	Name		Туре	Secured Capacity	BlockSize	SectorSiz	e OS Name	Status
Logical Device	RAID10_0		RAID 10	No 2.00 TB	512k	512B	HPT DISK 0_0	Normal Maintenance
Rescan	Member 1 "RAID10_	of D"	RAID 1	Arra	y Info	rmatio	n	Normal <u>Maintenance</u>
	Member 2 "RAID10	of D"	RAID 1	RAID10_0				Normal Maintenance
	• • • • • • • • •			Hember "RAID1"	r 1 of 0_0"		_	
			Pł	- 🚍 Dev	ice_1_E1_	_1 Delet	e	
	Location	Model		Dev Contraction	ice_1_E1_	_2	mo	y Max Free
	1/E1/1	Samsun	g SSD 98("RAID1	0_0"	Interna	ine	0.00 GB
	🚍 1/E1/2	Samsun	g SSD 98(- 🖃 Dev	ice_1_E1_	_4		0.00 GB
	🚍 1/E1/3	Samsun	g SSD 98(L _ Dev	ice_1_E1_	_3		0.00 GB
	□ 1/E1/4	Samsun	g SSD 98(Close	0.00 GB

4. A pop-up box pops up on the page, click **OK** to confirm the RAID deletion.

localhost:7402 says

All data on the array you selected will be deleted. Do you want to continue?



5. There is no deleted RAID information at Logical Device Information, indicating that the RAID deletion operation is complete.

Global View	Physical	Le	ogical	Setting	Event SH	II Help		
Create Array				Logica	l Device In	formation		
Spare Pool	Name	Туре	Secured	Capacity	BlockSize	SectorSize	OS Name	Status
Logical Device								
Rescan				Physica	al Device II	nformation		
	Loca	ition	Model			Secured	Capacity	Max Free
	🖃 1/E	1/1	Samsung S	SD 980 PRO 1	тв	No	1.00 TB	1.00 TB
	☐ 1/E:	1/2	Samsung S	SD 980 PRO 1	тв	No	1.00 TB	1.00 TB
	🗐 1/E	1/3	Samsung S	SD 980 PRO 1	тв	No	1.00 TB	1.00 TB
	🚍 1/E	1/4	Samsung S	SD 980 PRO 1	тв	No	1.00 TB	1.00 TB

Note1: *When the RAID is in the rebuild, verify, foreground/background init status or be mounted, deleting the RAID will prompt in use.*

① localhost:7402

Array 'RAID_0_0' can't be removed from the system. It is possible in use.

ок

Note2: When RAID is in rebuild, verify, foreground/background init status. If you want to delete the RAID, you can choose to stop the current operation and continue to delete the RAID. *Note3:* When RAID is be mounted. If you want to delete the RAID, you can umount the RAID Array and continue to delete the RAID.

Adding Spare Disks

Note: This feature is not supported by the SSD7202 or SSD7502.

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

Examp	le	screens	hot

Global View	Physical	Logical	Setting Event SHI Help	
Create Array			Spare Pool	
Spare Pool	Remove	Spare		
Logical Device			Available Disks	
Rescan		Device_1_E1_1	Samsung SSD 970 EVO Plus 500GB	500.02 GB
		Device_1_E1_2	Samsung SSD 970 EVO Plus 500GB	500.02 GB
		Device_1_E1_3	Samsung SSD 970 EVO Plus 500GB	500.02 GB
		Device_1_E1_4	Samsung SSD 970 EVO Plus 500GB	500.02 GB
	Add Spar	e		

To add spare disks:

- 1. Open the WebGUI
- 2. Click Logical
- 3. Click Spare Pool:
- Example screenshot

Global View	Physical Log	ical Setting Event SHI Help	
Create Array		Spare Pool	
Spare Pool	🗆 💁 Device_	1_E1_1 Samsung SSD 970 EVO Plus 500GB	500.02 GB
Logical Device	Remove Spare		
Rescan		Available Disks	
	Device_	1_E1_2 Samsung SSD 970 EVO Plus 500GB	500.02 GB
	Device_	1_E1_3 Samsung SSD 970 EVO Plus 500GB	500.02 GB
	🗌 🚍 Device_	1_E1_4 Samsung SSD 970 EVO Plus 500GB	500.02 GB
	Add Spare		

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

This site says					
1 disk(s) will be added to spare pool. Do you want to continue?					
ОК	Cancel				

6. 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 click 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 tab is the default page after clicking the Logical tab of the HRM. This page contains information about 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.

Global View	Physical L	ogical	Setting	g Ever	nt SHI	Help	
Create Array			L	ogical De	evice Info	ormation	
Spare Pool	Name	Туре	Capacity	BlockSize	SectorSize	OS Name	Status
Logical Device	W RAID_0_0	RAID 0	1.00 TB	512k	512B	HPT DISK 0_2	Normal <u>Maintenance</u>
Rescan							

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



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

- **Delete** deletes the selected RAID array
- Unplug in order to ensure data security, if you want to unplug NVMe while the system is working, click unplug first and then unplug NVMe (only support SSD7580B)
- Verify verifies the integrity of the RAID array (only support RAID1/10)
- **Rename** renames the RAID array.

Array Information & Maintenance Options: Critical Status

Physical L	ogical	Setting	Event	SHI	Help		
		Lo	gical Dev	vice Info	rmation		
Name	Туре	Capacity	BlockSize	SectorSize	OS Name	Status	
RAID_1_0	RAID 1	500.02 GB		5128	HPT DISK 0_0	Critical	Maintenance
			Array In	formatio	n		
Location	Model Samsu	n L O	_1_0 evice_1_E1_ ffline Disk	1	Delete Add Disk 500.	icity 02 GB	Max Free 0.00 GB
	Physical L Name RAID_1_0 Location = 1/E1/1	Physical Logical Name Type RAID_1_0 RAID 1 Location Model 1/E1/1 Samsu	Physical Logical Setting Physical Logical Setting Name Type Capacity RAID_1_0 RAID 1 500.02 GB Location Model Image: Display to the second se	Physical Logical Setting Event Logical Dev Name Type Capacity BlockSize RAID_1_0 RAID 1 500.02 GB Array In Location Model 1/E1/1 Samsun Offline Disk	Physical Logical Setting Event SHI Logical Device Info Name Type Capacity BlockSize SectorSize RAID_1_0 RAID 1 500.02 GB 512B Array Information RAID_1_0 Array Information Location Model Device_1_E1_1 1/E1/1 Samsun Offline Disk	Physical Logical Setting Event SHI Help Logical Device Information Name Type Capacity BlockSize SectorSize OS Name RAID_1_0 RAID 1 500.02 GB 512B HPT DISK 0_0 Array Information Location Model Pevice_1_E1_1 Delete 1/E1/1 Samsun Offline Disk Gapa	Physical Logical Setting Event SHI Help Name Type Capacity BlockSize SectorSize OS Name Status RAID_1_0 RAID_1 500.02 GB 512B HPT DISK 0_0 Critical Location Model Pevice_1_E1_1 Delete Add Disk Capacity 1/E1/1 Samsun Offline Disk Capacity 50.02 GB

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 a 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.

Array Information & Maintenance Options: Disabled Status

Global View	Physical	Logical	Setting	Event	SHI	Help		
Create Array			Lo	gical Dev	vice Infor	mation		
Spare Pool	Name	Type _0 RAID 0	Capacity 1.00 TB	BlockSize 512k	SectorSize 512B	OS Name	Status Disabled	Maintenance
Rescan	-			Array I	nformatio	n		
	Location	n Model Samsur		D_0_0 Device_1_E1 Offline Disk	u	Delete	apacity 00.02 GB	Max Free 0.00 GB
						Close		

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** – will delete the array

Physical Device Information

		Logical	ing Litent of	ix incip	
Controller 1		P	Physical Devices	Information	
Enclosure 1	bevi	ce 1 E1 4 Model	Micron_9300_MTFDF	AL3T8TDP Capacity	3.84 TB
Devices	Unpl	ug Revision	11300DN0	PCIe Width	x4
Pascan		Location	1/E1/4	PCIe Speed	Gen 3
Rescan		Max Free	0.00 GB		
		Status	Legacy		
		Serial Num	191621F1E94B		

- Unplug in order to ensure data security, if you want to unplug NVMe while the system is working, click unplug first and then unplug NVMe (only support SSD7580B)
- Model model number of the drive connected
- **Revision** revised version of drive
- Location which controller and port the drive is in
- Max Free total capacity that is not configured
- Status Current state of drive
- Serial Num Serial number of the drive
- Capacity total capacity of the drive
- **PCIe Width** PCIe width occupied by the driver
- PCIe Speed Rate of current bandwidth

Rescan

Clicking **Rescan** will ask the driver to recheck and report the array status.

When Rescan is initiated by the WebGUI; the driver will immediately check and see whether the status of any disk has changed. If there are any changes, the status of the disks and RAID array will be updated to reflect this.

- Disk Status if any disks were added or removed, or if a disk is no longer responding, the status will change.
- RAID status the RAID array's status may change depending on the status of the disks.

System Setting

Note: The temperature unit function is only supported by windows and i



Using this tab, you can change the following:

- Enable auto-rebuilding
- Enable rebuilding on error
- Restrict to localhost
- Set rebuild priority
- Set Enclosure Fan Speed
- Change port number
- Collecting system log
- Change Temperature Unit
- Change HRM password

System Setting

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.

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.

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]

Fan Speed (default: Auto) The default fan speed is Auto, you can adjust the speed of the fan, There are 5 levels [Auto, Off, Low, Medium, High]

Port Number (default: 7402) The default port that the HighPoint HRM listens on is 7402. You may change it to any open port.

Enable collecting system logs (default: Disabled)

You can set it to enabled to collect system logs at any time. The collected system logs are stored on the C:/Windows/hpt_diagdriver. The maximum capacity of the collected system log is 800MB, and parts exceeding 800MB will be overwritten forward.

Temperature Unit (default: °F)

The default temperature unit is Fahrenheit, you can change it to Celsius.

Password Settings

Changing your HRM password

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

Recovering your HRM password

If you forget your password, you can delete the file hptuser.dat. Then, restart the computer and open the WEBGUI to set a new password.

For Windows Users:

- 1. Open File Explorer.
- 2. Navigate to C:/Windows/
- 3. Delete hptuser.dat.
- 4. Reboot.

Email Setting

The following topics are covered under email:

- SMTP Setting
- Adding Recipients

You can 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 Setting
Enable Event Notification	
Server Address (name or IP):	smtp.mail.yahoo.com
Mail From (E-mail address):	hptu@yahoo.com
Login Name:	hptu@yahoo.com
Password:	••••••
SMTP Port:	465
Support SSL:	
	Change Setting
	Change Setting SMTP Setting
■Enable Event Notification	Change Setting SMTP Setting
■Enable Event Notification Server Address (name or IP):	Change Setting SMTP Setting outlook.office365.com
■Enable Event Notification Server Address (name or IP): Mail From (E-mail address):	Change Setting SMTP Setting outlook.office365.com eo1323972@outlook.com
■Enable Event Notification Server Address (name or IP): Mail From (E-mail address): Login Name:	Change Setting SMTP Setting outlook.office365.com eo1323972@outlook.com eo1323972@outlook.com
Enable Event Notification Server Address (name or IP): Mail From (E-mail address): Login Name: Password:	Change Setting SMTP Setting outlook.office365.com eo1323972@outlook.com eo1323972@outlook.com
Enable Event Notification Server Address (name or IP): Mail From (E-mail address): Login Name: Password: SMTP Port:	Change Setting SMTP Setting outlook.office365.com eo1323972@outlook.com eo1323972@outlook.com 25

Note: After you click Change Setting, the password field will be reset.

To set up email alerts:

Using a Yahoo Mail account as an example:

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

Email Precautions

If you want to receive notification mail using a Webmail account, you may need to modify the mailbox's permissions. The following example is for a Yahoo and outlook webmail account.

Yahoo Setting:

To change permission settings, please refer to the following link: https://help.yahoo.com/kb/account/SLN27791.html?impressions=true 1. Log in to yahoo email; click "Sign in" to log in: https://www.yahoo.com

yal	hod) .						Q	Sign in
Mail	News	Finance	Sports	Politics	Entertainment	Lifestyle	More		

2. After a successful login, click "Account Info" under the user name:

yahoo!				Q	🔒 high 学 🔤 M
Mail News Finance	Sports Politics	Entertainment L	ifestyle More	8	high point hptu@yahoo.com
			Trump names pick fo	r	Manage Publishers
			Russia	+	Add account
A CANADA			If confirmed by the Senate, John Sulliva be the top U.S. diplomat in Russia at a	in would	Sign Out

3. Go to the "Account Info" page, click "Account Security". On the "Account Security" page, click the "Allow apps that use less secure sign in" button:



Outlook Setting:

1. Sign in to mail and set it up, Login email address link: <u>https://outlook.live.com/mail/inbox</u>

0.9.1	
Email, phone, or Skype	
No account? Create one!	
	Next

2. Click Settings in the upper right corner, select the lower left corner: View all outlook settings



3. Enter the redirect page, select mail, then click Sync email



- 4. Let devices and apps use pop select 'yes'
- 5. choose 'Let app and devices delete messages from Outlook'

Note: The screenshot below can be used as a reference. The POP setting is the mailbox server.

		ook	,O Search			□□ 現在升	<u> </u>	Ð	₽.	0	? 🗢	
		Nex	Settings	Layout	ync email					×	加更少	I
-	×	Favo	Search settings	Compose and reply	OP options						寧更多	
R	×	Fold	@ General	Attachments L	et devices and apps use POP							i
8			🖾 Mail	Sweep	•) Ves						19 25	ġ
8	~	Grou	Calendar x ^R People View quick settings	Junk email Customize actions C	Pro- bevices and apps that use POP can be set to delete messages from Outloo Don't allow devices and apps to delete messages from Outlook. It will m Let apps and devices delete messages from Outlook	ok after download. nove the messages to a	special PC)P folder	instead.	1	Outlook.com 想 teDrive 分享權調 所著至更多,	100
0 0				Message handling Forwarding Automatic replies	09 Julien 新容器作 Guitos Checkes com 可定 20 Julien 10 J	\geq					E OneDrive 🕣	

Note: If you are having trouble configuring notification for your Email account, please contact our <u>Technical Support Department</u>

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. Set which type(s) of events will trigger an email using the respective Event Level check boxes.

	Add Recipient
E-mail:	hptu@yahoo.com
Name:	hpt
Event Level: Add Test	☐Information ⊡Warning ☐Error

4. (Optional) Click test to confirm the settings are correct by sending out a test email.

SMTP S	Setting		
smtp	p.mail.yahoo.coi	m	
hptu	@yahoo.com		
hptu	i@yahoo.com	•	
465			
Cha	ange Setting		
Recip	ients		
me	Event	Level	
Add Re	cipient		-
fully.			
			Error
	SMTP S smtp hptu hptu 465 Ch Recip me Add Re fully.	SMTP Setting smtp.mail.yahoo.com hptu@yahoo.com hptu@yahoo.com 465 Change Setting Recipients me Event Add Recipient	SMTP Setting smtp.mail.yahoo.com hptu@yahoo.com hptu@yahoo.com fv 465 Change Setting Recipients me Event Level Add Recipient fully.

- 5. Click add to add the 'recipient to recipient' list
- 6. The added recipient will display in under Recipients

Recipients										
E-mail hptu@yahoo.com Delete	Name hpt	Event Level Information , Warning , Error								
The email will inclu	ide the ou	tput recorded in the event lo								
• hptu@yahoo.com <hptu@yahoo.com> addressee: hpt</hptu@yahoo.com>		📇 🛛 tuesday, april 4 at 26:16 🔺								
Tue, 26 Apr 2022 16:40:32 CST: RAID 0 Array 'RAID_0_0' has been created s WD60EFRX-68MYMN1-WD-WX31DB48X74A, 9830A00BTTXE, 1/8).	uccessfully (Disk 1:WDC WI 1/6; Disk 3:HGST SDLL1ML	D4001FAEX-00MJRA0-WD-WCC130931558, 1/5; Disk 2:WDC .R038TCCA1-A016383B, 1/7; Disk 4:TOSHIBA KPM51RUG480G-								
	• •									

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
- **Prev** View previous log page
- Next View next log page

SHI (Storage Health Inspector)

- S.M.A.R.T Attributes
- Schedule a task (Task list and Health Inspector Scheduler)

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.

How to Enable SMART Monitoring

To access the SMART attributes of an individual disk:

- 1. Log in to the WebGUI.
- 2. Select the proper controller using the drop-down menu on the top left.
- 3. Click the SHI tab.
- 4. Click **Detail** on the desired disk:

Note: The current NVMe **Temperature threshold** is default set to $65^{\circ}C$ (149°F).

		Storage Health	Inspecto	r(SHI))	
Controller ID 1 Device Name Model Number Temperature Warning Composit	Location# E1_1 E1_2 te Temperature	Device Serial Number S463NF0K409595F S53VNSON602754T Device_1_E1_2 Samsung SSD 970 PR 96°F Threshold 177°F Threshold 177°F	RAID None None O 512GB	∘F 89 96	Total Bytes Written 1023.90 TB 75.45 TB	S.M.A.R.T <u>Detail</u> <u>Detail</u>
entited composite	remperature i	NVME S.M.A.I	R.T Attrib	utes		
Name Critical Varning Composite Tempe Available Spare TI Precentage Used Data Units Read Data Units Writter Host: Read Comma Host: Write Comm Controller Busy TI Power Cycles Power On Hours Unsafe Shutdowns Media and Data IT Warning Temperature Sensi Temperature Sensi Temperature Sensi	rature (C) areshold ands ands stegrity Errors formation Log ture Time Temperature T sor 1 (C) sor 3 (C) sor 3 (C) sor 5 (C) sor 5 (C) sor 5 (C) sor 7 (C) sor 7 (C)	Entries Tme			Vatue 0x0 36 100% 4% 0xe417cbf 0x9a82fe1 0x9a84aa44 0x896c4c53 0x40e 0x1bf 0xd0e 0x0 0x742 0x0 0x0 36 51 0 0 0 0 0 0 0 0 0 0 0 0 0	
		HDD Tempera	ture Thre	shold		

Set harddisk temperature threshold : 149 °F Set

If the temperature exceeds 65°C (149° F), it will display "**Red**".

Global View	w Physical	Logical Setting	Event	SHI	Help	
						Schedule
		Storage Healt	h Inspecto	or(SHI))	
Controller ID	Location#	Device Serial Number	RAID	٩F	Total Bytes Written	S.M.A.R.T
1	E1_1	S463NF0K409595F	None	150	1023.91 TB	Detail
1	E1_2	S5JYNS0N602754T	None	111	75.45 TB	Detail
		HDD Temper	ature Thre	eshold		
Set harddisk tem	perature thresho	ld : 149 °F	Set			

The TBW (Total Bytes Written) information can be used to monitor the lifespan of the NVMe drives.

	Storage Health Inspector(SHI)											
Controller ID	Location#	Device Serial Number	RAID	٩F	Total Bytes Written	S.M.A.R.T						
1	E1_1	S463NF0K409595F	None	96	1023.91 TB	Detail						
1	E1_2	S5JYNS0N602754T	None	102	75.45 TB	Detail						
	HDD Temperature Threshold											
Set harddisk ten	perature thresho	ld : 149 °F	Set									

How to Use the Health Inspector Scheduler

	The later is a second
	Tasks List
	New Verify Task
Cask Name Schedule:	RAID_1_0 •• Occurs one time on 2020 - 4 - 10 at 0 : 0 : 0 •• On Sunday 1 at 0 : 0 : 0 •• On Sunday 1 at 0 : 0 : 0 •• Start date: 2020 - 4 - 10 •• No end date: 2020 - 4 - 10 •• No end date
	Health Inspector Scheduler
Task Name Select a Sc Select a tin	hedule: Oaily®WeeklyOBi-WeeklyOMonthly ne: Sunday v1 0:0:0

The **Health Inspector Scheduler (HIS)** enables you to schedule disk/array checkups to ensure disks/array are functioning optimally.

If you want to check the disk status on a daily, weekly, or monthly basis, you can enable this using the **HIS** function.

For example:

- 1. Set the 'Task Name' to 't1', select the schedule as 'Daily', and set the time to 10:10
- 2. After clicking "Submit", the task you created will be shown under the "Task List".

Global View	Physical	Logical Set	tting Event	SHI	Help
			Tasks List		
Name Descri	ption Il disks every day at	10:10:0			
		Health	Inspector Sch	eduler	
Task Name:					
Select a Schedule	: ODaily Weekly	Bi-Weekly O Month	nly		
Select a time: Submit	Sunday 🗸 1	0:0	: 0		
When the o	perating temp	perature of the	ne disk excee	ds 65°,	a "Wa
Global View	Physical Logical	Setting Event	SHI Help		
		Event View (1)			
🖲 🜉 All 🛛 🜉 Info	🔿 🔥 Warning 👘 🔿 🔀 E	rror		Do	wnload Clear
Date Time	Description Disk 'Samsung SSD 97 threshold.	0 EVO Plus 500GB' (Locati	on: Device_1_E1_2)tempe	rature is higher	r than

How to Create a New Verify Task

All Redundant RAID arrays (RAID 1) will appear under New Verify Task

- 1. Log into the 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.
- 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.

Log collecting

Diagnostic view

We have provided a detailed video on log collection methods: link

For Example - Linux system

1. Start the WEBGUI, Diagnostic view will appear when Driver or HPT card does not effect, you can see the system information and HPT Product information in this view.



2. You can also click 'Help' \rightarrow 'Diagnostic' to enter the diagnostic view.

							High Point Technologies, Inc.
Global View	Physical	Logical	Setting	Event	SHI	Help	
Controller				Contr	oller Inf	Online Help	
Rescan	Model N Vendor:	ame:	Hig Hig	ghPoint NVMe ghPoint Techr	RAID Con nologies, Ir	Diagnostic troner nc.	

Log saving

Enter the Diagnostic view, click 'Save Logs', your log information will be collected. 'Logs Location' will display the location of the saving path.



If you have problems in use, please submit the log to our online service (<u>https://www.highpoint-tech.com/support-and-services</u>).

Using the HighPoint Command Line Interface (CLI)

How to use the CLI directly

Syntax:

hptraidconf -u {username} -p {password} {<u>CLI command</u>} The default user name is: **RAID**, password is: **hpt**; This default password can be modified in the <u>WEBGUI</u>—<u>Password setting</u>.

Example 1: In Windows System

Step 1: Run 'Command Prompt' as Administrator;

Step 2: Enter 'hptraidconf -u RAID -p hpt help', Show generic help about this utility;



Enter **'hptraidconf -u RAID -p hpt help set'** to show the system settable parameters.



Enter 'hptraidconf -u RAID -p hpt query devices' to query device.

C:\Wind	ows\system32:	hptraidconf	-u RAID	-p hpt q	uery devices			
ID	Capacity	MaxFree	Flag	Status	ModelNumber			
1/E1/1 1/E1/2 1/E1/3 1/E1/4 1/E1/5 1/E1/6 1/E1/7	512.11 512.11 500.11 500.11 2000.40 2000.40 1024.21	0 0 0 0 0 0 0 0	SINGLE SINGLE SINGLE SINGLE SINGLE SINGLE SINGLE	LEGACY LEGACY LEGACY LEGACY LEGACY LEGACY LEGACY LEGACY	Samsung SSD Samsung SSD Samsung SSD Samsung SSD Seagate Fire Seagate Fire KXG60ZNV1T02	970 PRO 970 PRO 980 PRO 980 PRO eCuda 520 eCuda 520 2 TOSHIBA	512GB 512GB 500GB 500GB 9 SSD ZP2000 9 SSD ZP2000	9GM30002 9GM30002
1/E1/8	1024.21		SINGLE	LEGACY	KXG60ZNV1T02	2 TOSHIBA		

Example 2: In Linux System

Step 1: Open 'Terminal' and enter root permissions;

Step 2: execute the command 'hptraidconf -u RAID -p hpt query devices' to query device.

root@test-Z390-AORUS-XTREME:/home/test#		hptraidc	onf -u RAID -p hpt query devices		
ID	Capacity	MaxFree	Flag	Status	ModelNumber
1/E1/1 1/E1/2 1/E1/3 1/E1/4	500.03 512.11 1000.20 1000.20	0 0 0 0	RAID SINGLE SINGLE SINGLE	NORMAL LEGACY LEGACY LEGACY	Samsung SSD 980 PRO 500GB Samsung SSD 970 PRO 512GB WDS100T3X0C-00SJG0 WD Green SN350 1TB

How to use the CLI in Windows

Method1: Run 'Command Prompt' as Administrator and enter hptraidconf and press Enter



Method2: Click 'Start' to find the HighPoint RAID Management folder, and click on hptraidconf



How to use the CLI in a Linux system

Open 'Terminal' and enter root permissions, then execute the command 'hptraidconf' to enter the CLI

File Edit View Search Terminal Help test@test-System-Product-Name:~\$ sudo su [sudo] password for test: root@test-System-Product-Name:/home/test# hptraidconf

CLI Command Reference

This chapter discusses the various HighPoint CLI commands: Query, Create, Delete, Rebuild, Verify, Unplug, Switch, Lscard, Rescan, Init, Events, Mail, Task, Set, Clear, Diag, Help and Exit.

Warning: using Create/Delete commands may destroy data stored in the disks, and this lost data can never be recovered. Please be cautious when executing these commands. The CLI utility will not prompt you before each command is executed.

The following example is for a Windows system:

Query Commands

Syntax:

query controllers | query devices | query devices {devices_id} |
query arrays | query arrays {array_id}

query controllers

This command reports controller information **Single card**:

Example screenshot



query enclosures

This command reports Product ID information.



Cross-Sync:

Note: This function is only supported by SSD7101A-1, SSD7105, SSD7104, SSD7120, SSD7202, SSD7505, SSD7749M, SSD7749E Example screenshot

HPT	CLI > query encl	losures	NumberOfPYH
ID	VendorID	ProductID	
1	НРТ	SSD7505	4
2	НРТ	SSD7505	4
нрт	CLI >		

query devices

This command will provide the status of each physical device hosted by the controller. It provides a list of device ID's, capacity, model numbers, status, and array attributes. Each device's status will be listed as one of the following: NORMAL, DISABLED, SPARE, RAID and BOOT.

Attributes:

ID:

A device ID is a string used to represent a disk. It is in the format "controller/channel/ device" for NVMe controllers. E.g. 1/E1/1 represents the disk on controller 1 port 1;

Capacity:

The capacity of the disk in GB.

MaxFree:

The Maximum sequence free space on a disk which can be used by creating array.

Flag:

Shows whether the disk is single or has been created RAID.

Status:

This will display the disk status (1 of 4 possible states):

- NORMAL: The disk's status is normal.
- DISABLED: The disk cannot be used. (May be related to disk failure or removal)
- RAID: The disk is a member of a RAID array.
- SPARE: The disk has been set as a spare disk

ModelNumber:

The disk's model number.

Single card:

Example screenshot

HPT CLI ID	> query devi Capacity	ices MaxFree	Flag	Status	ModelNum	ıber				
1/E1/1 1/E1/2 1/E1/3 1/E1/4 	500.03 500.03 500.03 500.03	500.03 500.03 500.03 500.03	SINGLE SINGLE SINGLE SINGLE	NORMAL NORMAL NORMAL NORMAL	Samsung Samsung Samsung Samsung	SSD SSD SSD SSD	970 970 970 970	EVO EVO EVO EVO	Plus Plus Plus Plus	500GB 500GB 500GB 500GB

Cross-Sync:

Example screenshot

HPT CLI ID	> query dev Capacity	ices MaxFree	Flag	Status	ModelNumber
1/E1/1 1/E1/2 1/E1/3 1/E1/4 1/E2/1 1/E2/2	512.11 512.11 512.11 512.11 1000.20 1000.20	0 0 0 0 0 0 0	SINGLE SINGLE SINGLE SINGLE SINGLE SINGLE	LEGACY LEGACY LEGACY LEGACY LEGACY LEGACY	Samsung SSD 970 PRO 512GB Samsung SSD 970 PRO 512GB Samsung SSD 970 PRO 512GB Samsung SSD 970 PRO 512GB WDS100T3X0C-005JG0 WDS100T3X0C-005JG0 WDS100T3X0C-005JG0
1/E2/4	1000.20	0	SINGLE	LEGACY	WDS100T3X0C-00SJG0

query devices {device_id}

This command presents information for the specified device.

Attributes:

Mode Number:

The disk's model number.

Serial Number:

The disk's Serial number.

Firmware Version:

The disk's Firmware version.

Capacity:

The disk's capacity.

Status:

The disk's status.

Read Ahead/Write Cache/TCQ/NCQ Status:

Disk's Read Ahead/Write Cache/TCQ/NCQ status could be enabled/disabled/--(not support)

Pcie width:

The disk's Pcie width.

Temperature:

The disk's temperature and setting temperature threshold.

S.M.A.R.T Attributes:

S.M.A.R.T Attributes detailed information reported by hard disk.

Example:

HPT CLI > query devices 1/E1/1 Mode Number: Samsung SSD 970 EVO Serial Number: S4EVNMFN502918J Firmware Version: 2B2QEXM7 Capacity(GB): 500.03 Tota Status: SINGLE Flag PCIe Width: x4 PCLE Temperature (C): Warning Composite Temperature Threshold Critical Composite Temperature Threshold	Plus 500GB IFree(GB): 500.03 :: NORMAL : Speed: Gen 3 47 (C): 85 (C): 85
S.M.A.R.	T Attributes
S.M.A.R.T Status OK. Name	Value
Critical Warning Composite Temperature (C) Available Spare Available Spare Threshold Percentage Used Data Units Read Data Units Written Host Write Commands Controller Busy Time Power On Hours Unsafe Shutdowns Unsafe Shutdowns Wedia and Data Integrity Errors Number of Error Information Log Entries Warning Temperature Time Critical Composite Temperature Time Temperature Sensor 1 (C) Temperature Sensor 2 (C) Temperature Sensor 3 (C) Temperature Sensor 5 (C) Temperature Sensor 7 (C) Temperature Sensor 7 (C)	: 0x0 : 47 : 100% : 11% : 7% : 0x6b05bb1 : 0x6b05bb1 : 0x8cb661dc : 0x6a642263 : 0x61f : 0x48c : 0x1cb : 0x48c : 0x48c : 0x06 : 0x06 : 0x0 : 0x0

query arrays

This command lists information for all configured arrays. It will list each array's ID, capacity, RAID level, and status information.

Note: An array ID is generally represented by number or set of numbers.

Attributes:

Type:

SSD7202/7502: The array's type. (RAID0, RAID1) SSD7101A-1/7105/7120/7204/7104/6444/6540/6540M/7505/7184/7180/7140A/7540/ 7580A/7580B/6780A/7749M/7749E: The array's type. (RAID0, RAID1, RAID10)

Status:

- NORMAL: Array status is normal
- DISABLED: Array is disabled.
- REBUILDING: Array is being rebuilt
- VERIFYING: Array is verifying
- INIT(F): Initializing an array using Foreground mode
- INIT(B): Initializing an array using Background mode
- UNINITIALIZED: Array is not initialized
- CRITICAL: Array is in a degraded status (no data redundancy)

Block:

Array Block size.

Sector:

Bytes per sector.

Cache:

Array Cache Policy WT: Write Through WB: Write Back NONE: No Cache policy enabled

Example:

HPT ID	CLI > query arra Capacity(GB)	ays Type	Status	Block	Sector	Cache	Name
1	500.03	RAID1	NORMAL		512B	NONE	RAID_1_0

query arrays {arrays_id}

This command will present information of each disk of a specified array.

Example:

HPT CLI > query	arrays 1							
ID:	1	Nam	e:	RAID_1	_0			
Type:	RAID1	Sta	tus:	NORMAL				
Capacity(GB):	500.03	Blo	ckSize:					
SectorSize:	512B	Cac	hePolicy:	NONE				
Progress:								
ID Capacit	y MaxFree	Flag	Status	ModelNum	ıber			
1/E1/1 500.03	0	NORMAL	RAID	Samsung	SSD 9	70 EVO	Plus	500GB
1/E1/2 500.03	0	NORMAL	RAID	Samsung	SSD 9	70 EVO	Plus	500GB

Init Commands

You can use init commands to initialize disks or arrays. A drive must be initialized first before being used to create arrays.

Syntax:

```
init {device_id} | init {array_id} {start|stop}
```

init {device_id}

This command initializes a disk for first use or a legacy disk on the controller.

Example:

After entering the CLI, enter the command: 'query devices' to view the current NVMe status is 'LEGACY', enter 'init 1/E1/1', NVMe status is 'NORMAL'.

HPT CLI ID	> query dev: Capacity	ices MaxFree	Flag	Status	ModelNumber
1/E1/1 1/E1/2	500.11 500.11	0 0	SINGLE SINGLE	LEGACY LEGACY	Samsung SSD 970 EVO Plus 500GB Samsung SSD 970 EVO Plus 500GB
HPT CLI	> init 1/E1,	/1			
HPT CLI	> init 1/E1,	/2			
HPT CLI ID	> query dev: Capacity	ices MaxFree	Flag	Status	ModelNumber
1/E1/1 1/E1/2	500.03 500.03	500.03 500.03	SINGLE SINGLE	NORMAL NORMAL	Samsung SSD 970 EVO Plus 500GB Samsung SSD 970 EVO Plus 500GB

Note: This command instructs the controller to initialize the disk on controller 1 channel 1. All data on the disk will be destroyed.

init {array_id} {start|stop}

This command starts/stops the initialization process of a redundant RAID array (RAID 1)



This command instructs the controller to stop/start initialization process on array 1. Take Samsung 970 EVO PLUS as an example, create RAID1 init time is about 10 minutes.

Create Commands

This command allows you to create a new RAID array, add a spare disk, or expand/migrate an existing array.

Note: A drive must be initialized first before being used to create arrays.

Syntax:

create {RAID0|RAID1|RAID10 spare} [create-options]

Parameters

You can specify one or more create options for this command, separated by a space. The options can be typed in any order.

disks= specifies member disks which will compose a new array, e.g., disks=1/E1/1,1/E1/2, disks=*. The character * means all available drives.

NOTE: When you enter a complete command with parameters disks=* at the shell prompt, the correct writing is disks="*". For example: hptraidconf -u RAID -p hpt create RAID0 disks="*".

init= specifies the initialization option (foreground, background, quickinit, keep old data). The default option is create-only. The create-only option is applicable for all the RAID types, which is to create an array without any initialization process. Initialization is needed for redundant arrays to provide data redundancy.

foreground: Initialize an array using foreground mode. This is the recommended method when creating redundant RAID arrays.

background: Initialize an array using background mode. The array is accessible during array initialization.

Quickinit: Do a quick init.

keep old data: This option will create the RAID array but keep existing data on RAID array. This option should be selected when trying to recover a RAID array.

- src= specifies an existing array to be expanded/migrated. All data on the source array will be redistributed online to the target array. If this parameter is omitted, a new array is created.

capacity= specifies the capacity, in size of MB, for the target array. Maximum capacity is default.

- **bs**= specifies the block size, in KB, for the target array. This option is only valid for stripped RAID levels.
- **sector**= specifies the logical sector size, in B/KB, for the target array. This option is only valid for stripped RAID levels. The default is 512 Bytes.

Example:

HPT CLI	> query	arrays 1			
D:			Nan	ie:	RAID0_0
ype:		RAIDØ	Sta	atus:	NORMAL
apacit	y(GB):	4096.33	Blo	ockSize:	512k
sectors	ize:	512B	Cac	hePolicy:	NONE
rogres					
D	Capacity	y MaxFree	Flag	Status	ModelNumber
/E1/1	512.04	0	NORMAL	RAID	Samsung SSD 970 PRO 512
/E1/2	512.04	0	NORMAL	RAID	Samsung SSD 970 PRO 512
/E1/3	512.04	0	NORMAL	RAID	Samsung SSD 970 PRO 512
L/E1/4	512.04	0	NORMAL	RAID	Samsung SSD 970 PRO 512
/E2/1	1000.12	488.08	NORMAL	RAID	WDS100T3X0C-00SJG0
/E2/2	1000.12	488.08	NORMAL	RAID	WDS100T3X0C-00SJG0
/E2/3	1000.12	488.08	NORMAL	RAID	WDS100T3X0C-00SJG0
/E2/4	1000.12	488.08	NORMAL	RAID	WDS100T3X0C-00SJG0

This command instructs the system to create a RAID0 array using the disks attached to controller 1 channels 1/2/3/4, and controller 2 channels 1/2/3/4; capacity is maximum, Block Size is 512KB.

		0.1704			400000 .		• • • •	E 4 O L		
HPT CLI	> creat	e RAIDe	0 disks=*	capacity	=100000 1	Init=quicki	.nit bs	5=512K		
HPT CLI	> auerv	arravs	: 1							
ID:		1		Nam	e:	RAIDØ	0			
Type:		RAIDØ		Sta	tus:	NORMAL				
Capacity	y(GB):	100.00		Blo	ckSize:	512k				
SectorS	ize:	512B		Cac	hePolicy:	NONE				
Progress	5:									
ID	Capacit	y Ma	xFree	Flag	Status	ModelNum	iber			
1/E1/1	500.03	45	0.03	NORMAL	RAID	Samsung	SSD 97	70 EVO	Plus	500G
1/E1/2	500.03	45	0.03	NORMAL	RAID	Samsung	SSD 97	70 EVO	Plus	500G
HPT CLI	>									

This command instructs the system to create a RAID0 array using the disks attached to controller 1 channels 1 and 2; capacity is 100GB, Block Size is 512KB.

HPT CLI	> query de	vices								
ID	Capacity	MaxFree	Flag	Status	ModelNu	nber				
1/E1/1	500.03	450.03	RAID	SPARE	Samsung	SSD	970	EVO	Plus	500GB
1/E1/2	500.03	450.03	RAID	NORMAL	Samsung	SSD	970	EVO	Plus	500GB

This command instructs the system to set the disk on controller 1 channel 1 to function as a spare disk.

Delete Command

This command allows you to delete an existing RAID array or remove a spare disk. After deletion, the original array and all data on it will be lost. All the member disks will be listed as available single disks.

Note: If you want to use a single disk after deleting the RAID, please restart the system after deleting the RAID. When the single disk status shows the Legacy status in WEBGUI or CLI, it can be used normally.

Syntax

delete {array_or_spare_ID}

Example:



This command instructs the system to delete the array whose id is "1". You can query the array ID before the deletion.

HPT CLI ID	> query dev: Capacity	ices MaxFree	Flag	Status	ModelNum	ıber				
1/E1/1 1/E1/2	500.03 500.03	500.03 500.03	SINGLE SINGLE	SPARE NORMAL	Samsung Samsung	SSD SSD	970 970	EVO EVO	Plus Plus	500GB 500GB
HPT CLI	>delete 1/	E1/1								
HPT CLI ID	> query dev: Capacity	ices MaxFree	Flag	Status	ModelNum	ıber				
1/E1/1 1/E1/2	500.03 500.03	500.03 500.03	SINGLE SINGLE	NORMAL NORMAL	Samsung Samsung	SSD SSD	970 970	EV0 EV0	Plus Plus	500GB 500GB
HPT CLI										

This command is used to remove the spare disk on controller 1 channel 1.

Unplug Command

In order to ensure data security, if you want to unplug NVMe while the system is working, click unplug first and then unplug NVMe (It is supported on SSD7580B).

Syntax

unplug {array _id or device _id}

Example:



This command instructs the controller to disconnect the array "1"; you can then disconnect the drives safely.

Rebuild Commands

You can use rebuild commands to rebuild a RAID1 array when it is critical or broken.

Syntax

rebuild {array_id} {device_id}
rebuild {array id} {start|stop}

rebuild {array_id} {device_id}

This command allows you to add the specified disk to a broken array and rebuild it.

Example:



This command instructs the controller to add the disk "1/E1/1" to rebuild the array "1". You can use the query commands first to verify the device ID and the array ID information before the rebuild command.

rebuild {array_id} {start|stop}

This command allows you to start or stop the rebuilding process on the specified array. After you stopped a rebuilding process, you can resume it at a later time by the rebuild start command.

Example:

HP	T CLI> rebu	uild 1 s	start				
HPT	CLI > rebuild 1	start					
HPT ID	CLI > query arr Capacity(GB)	ays Type	Status	Block	Sector	Cache	Name
1	500.03	RAID1	REBUILDING		512B	NONE	RAID1_3
T 1 '	• 1	1	1 1 111			.1	66 1 99

This command starts the rebuilding process on the array "1".

HI	PT CLI> rebu	uild 1 st	top				
НРТ	CLI > rebuild 1	stop					
HPT ID	CLI > query arra Capacity(GB)	iys Type	Status	Block	Sector	Cache	Name
1	500.03	RAID1	CRITICAL		512B	NONE	RAID1_3

This command stops the rebuilding process on the array "1".

Verify Command

Syntax

verify {array_id} {start|stop}
This command starts or stops the verify process on the specified array.

Example:

HPT CLI> verify 1 start This command starts to verify the array "1".

HPT CLI> verify 1 stop

This command stops the verify process on the array "1".

нрт	CLI > verify 1	start					
HPT ID	CLI > query arr Capacity(GB)	ays Type	Status	Block	Sector	Cache	Name
1	500.03	RAID1	VERIFYING		512B	NONE	RAID1_3
нрт	CLI > verify 1	stop					
HPT ID	CLI > query arr Capacity(GB)	ays Type	Status	Block	Sector	Cache	Name
1	500.03	RAID1	NORMAL		512B	NONE	RAID1_3
нрт							

Rescan Command

This command will rescan all of the physical devices attached to the RAID controller.

Syntax

rescan

Example:



Lscard Command

The lscard command is used to list multiple RAID controllers.

Syntax

lscard

Example:

HPT CLI> lscard								
HPT CLI >	> lscard							
CARD_ID	NAME	ACTIVED						
0	Controller(1): NVMe	Active						
HPT CLI >	>							

Events Commands

The CLI system will automatically record three types of events: Information (shortened to "Inf"), Warning (shortened to "War"), and Error (shortened to "Err") on the screen output. These commands allow you to query, save, or clear the logged events.

Syntax

events | events clear | events save {file_name}

events

This command will display a list of all the logged events.

Example:



events save {file_name}

This command will save all the logged events as a plain text file.

Example:

HPT CLI> events save C:/raidlog.txt HPT CLI > events save C:/raidlog.txt The event log C:/raidlog.txt has been saved.

This command will save all the events to C:/raidlog.txt.

Mail Commands

Syntax

mail recipient

mail recipient add {recipient_name} {mail_address} [Inf|War|Err]

mail recipient delete {recipient_name}

mail recipient test {recipient_name}

mail recipient set {recipient_name} {Inf|War|Err}

mail server

mail server set {server_address} {port} { status } {from_address} [username] [password]

mail server set $\{a|p|s|m|u|t\}$ $\{value\}$

mail recipient

--- List all of the mail recipients

Example:

ΗP	T CLI>	mail recipient	
HPT (ID	CLI > <mark>mail</mark> Name	recipient Mail Address	Notify Types
1	hpt	yzhang@highpoint-tech.com	Information Warning Error

mail recipient add {recipient_name} {mail_address} [Inf|War|Err]

--- Add a new recipient

Example:

HPT CLI > mail recipient add admin <u>admin@somecompany.com</u> Inf War Err

HPT	CLI >	mail	recipi	ient		Notify	Tupoc		
TD	Name		mall	Address		NOLITY			
1	hpt		yzhang	g@highpoint-tech.c	om	Informat	tion Warnin	ng E	rror

This command will setup the RAID system to send mail to admin@somecompany.com for any logged events.

mail recipient delete {recipient_name}

--- Delete an existing recipient.

Example:



mail recipient test {recipient_name}

--- Send a test email to a specified recipient.

Example:

HPT CLI> mail recipient test hpt HPT CLI > mail recipient test hpt

HPT CLI >

You will receive a test email.

Mon, 11 May 2020 07:52:30 : This is a test mail.

mail recipient set {recipient_name} {Inf|War|Err}

--- Set the notification type for a recipient. **Example:** HPT CLI> mail recipient set admin War Err

mail server

--- display the SMTP server information

Example:

HPT CLI> mail server				
HPT CLI > mail server ServerAddress Port	ssl	Status	Mail From	User Name
secure.emailsrvr.com465	1	Enabled	yzhang@highpoint-te	ch.comyzhang@highpoint-tech.com

mail server set {server_address} {port} {ssl} {status} {from_address} [username] [password]

--- Use this command to configure mail server settings.

 $\{server_address\} - SMTP server address$

{port} – port, generally 25

{ssl} – used ssl, 'l' for enable and port need 465, '0' for disable

{status} – status, 'e' for enable or 'd' for disable

{from_address} - mail from address

{username} –mail username

{password} – the user's password

Example:

HPT CLI> mail server set secure.emailsrvr.com 465 1 e name@somecompany.com name@somecompany.com password

HPT CLI > mail server set secure.emailsrvr.com 465 1 e yzhang@highpoint-tech.com yzhang@highpoint-tech.com HPT CLI > mail server ServerAddress Port ssl Status Mail From User Name secure.emailsrvr.com465 1 Enabled yzhang@highpoint-tech.comyzhang@highpoint-tech.com

HPT CLI> mail server set mail.somecompany.com 25 0 e admin@somecompany.com password

HPT CLI > mail server set secure.emailsrvr.com 25 0 e yzhang@highpoint-tech.com yzhang@highpoint-tech.com HPT CLI > mail server ServerAddress Port ssl Status Mail From User Name Secure.emailsrvr.com25 0 Enabled yzhang@highpoint-tech.comyzhang@highpoint-tech.com

mail server set {a|p|s|m|u|t} {value}

--- Use this to separate set your mail server value

Parameters

- a SMTP server address
- p-port, generally 25
- s status, 'e' for enable or 'd' for disable
- m mail from address
- u username
- t-user's password

Example:

- HPT CLI> mail server set a smtp.somecompany.com
- --- Change the server address

HPT CLI> mail server set p 465

Change the	port				
HPT CLI > mail ser	ver set	p 465			
HPT CLI > mail ser ServerAddress	ver Port	ssl	Status	Mail From	User Name
smtp.163.com	465	0	Enabled	yzhang@highpoi	int-tech.comyzhang@highpoint-tech.com

HPT CLI> mail server set s d

	Disable	mail no	otifica	atio	n				
HPT	CLI > mai	l server	set s	d					
HPT Serv	CLI > mai verAddress	l server Po	ort :	ssl	Status	Mail From	User Na	ame	
smtp	p.163.com	46	5 (9	Disabled	yzhang@highpo	int-tech.comyz	zhang@highpoint	-tech.com

HPT CLI> mail server set s e

Enable mail notification								
HPT CLI > mail	server set s	e						
HPT CLI ≻ mail ServerAddress	server Port	ssl	Status	Mail From	User Name			
smtp.163.com	465	0	Enabled	yzhang@highp	point-tech.comyzhang@highpoint-tech.com			

Task Commands

When an array requires regular verification or rebuilding, you can use the task commands to automate this process in the background. If you have the appropriate privileges, you can add new tasks, and modify or delete existing tasks.

Syntax

task

```
task rebuild {array_id} {name=} {once|daily|monthly|weekly}={day} interval={interval} start=mm/dd/yyyy end=mm/dd/yyyy time=hh:mm:ss
```

```
task verify {array_id} {name=} {once|daily|monthly|weekly}={day
interval={interval} start=mm/dd/yyyy end=mm/dd/yyyy time=hh:mm:ss
```

task delete {task_id}
task enable {task id}

task disable {task_id}

task

This command displays detailed information about all scheduled tasks.

Example:

HPT CLI> task This command displays the current background tasks.

task rebuild {array_id}{name=}{once|daily|weekly|monthly={day} interval={interval} start=mm/dd/yyyy end=mm/dd/yyyy time=hh:mm:ss

This command allows you to schedule the frequency as once, daily, weekly or monthly, and the detailed time range to rebuild a specified array. The first mm/dd/yyyy specifies the task start date, while the second mm/dd/yyyy specifies the task end date.

Note:

When you add a task to rebuild a selected array once, the parameter {day} should be omitted.

Example:

HP	HPT CLI> task rebuild 1 name=test once start=5/11/2020 time=17:03:35										
HPT	CLI > task	rebuild 1 name	=test once star	t=5/11/2020	time=17:03:35						
HPT ID	CLI ≻ task Name	Start-Date	End-Date	S-F	Description						
1	test	05/11/2020	N/A	E-0	Rebuild raid RAID_1_0 (created by $\%$						
нрт	CLI >										

This command adds a task schedule named test to rebuild the array "1" at 17:03:35 on 5/11/2020. The rebuild frequency is set to once.

HPT CLI> task rebuild 4 name=myraid4 daily=2 start=2/8/2020 end=2/22/2020 time=13:49:58 This command adds a task schedule named myraid4 to rebuild the array "4" at 13:49:58 every 2 days from 2/8/2005 to 2/22/2020.

HPT CLI> task rebuild 3 name=myraid3 weekly=2 interval=3 start=2/8/2020 end=2/22/2020 time=13:49:58

This command adds a task schedule named myraid3 to rebuild the array "3" at 13:49:58 on Monday (the 2nd day in a week) every 3 weeks from 2/8/2020 to 2/22/2020.

HPT CLI> task rebuild 2 name=myraid2 monthly=3 interval=4 start=2/8/2020 end=2/8/2020 time=12:30:33

This command adds a task schedule named myraid3 to rebuild the array "2" at 12:30:33 on the 3rd day of a month every 4 months from 2/8/2020 to 2/8/2020.

task verify

{array_id} {name=} {once|daily|weekly|monthly}={day} interval={interval} start=mm/dd/yyyy end=mm/dd/yyyy time=hh:mm:ss

This command allows you to schedule a verify task. The usage of this command is the same as adding a rebuild task schedule.

Example:

HPT CLI> task verify 1 name=test once start=5/11/2020 time=17:12:33									
НРТ	CLI > task	verify 1 name=	test once start	=5/11/2020	time=17:12:23				
HPT ID	CLI > task Name	Start-Date	End-Date	S-F	Description				
1	test	05/11/2020	N/A	E-0	Verify raid RAID_1_0 (created by)				
нрт	CLI >								

task delete {task_id}

This command allows you to delete a scheduled task. You can query the task ID by task command.

Example:

HP	PT CLI>	task delete	1		
HPT ID	CLI > task Name	Start-Date	End-Date	S-F	Description
1	test	05/11/2020	N/A	E-0	Verify raid RAID_1_0 (created by)
нрт	CLI > task	delete 1			
HPT ID	CLI > task Name	Start-Date	End-Date	S-F	Description
нрт	CLI >				

This command will delete the task "1".

task enable {task_id}

This command will enable a disabled task.

Example:

HI	HPT CLI> task enable 1									
нрт	CLI > ta	sk enable 1								
нрт	CLI > ta	sk								
ID	Name	Start-Date	End-Date	S-F	Description					
1	test	05/11/2020	N/A	E-O	Verify raid RAID_1_0 (created by)					

This command will enable the disabled task "1".

task disable {task_id}

This command will disable a scheduled task manually.

Example:

HPT CL	HPT CLI> task disable 1									
HPT CLI >	task disable 1									
HPT CLI > ' ID Name	task Start-Date	End-Date	<u></u>	Description						
1 test	05/11/2020	N/A	D-0	Verify raid RAID_1_0 (created by)						

This command will disable the scheduled task"1".

Set Commands

Syntax

```
set | set [name]={value}
```

set

Show the system settable parameters.

HPT CLI > set							
Show the system setable parameters.							
<pre>[AR] Auto Rebuild [CE] Continue Rebuild On Error [AA] Audible Alarm [RP] Rebuild Priority [SD] Spindown Idle Disk (minutes) [BP] Beeper [FS] Eclosure Fan Speed [TT] Temperature threshold [TU] Temperature unit [PS] Password</pre>	Enable Enable Enable Medium Disable Enable Auto 149 F 						
HPT CLI >							

• set $AR = \{y|n\}$

Set enable or disable to the [Auto Rebuild] parameter.

Example: HPT CLI> set AR=y

• set $CE = \{y|n\}$

Set enable or disable to the [Continue Rebuilding On Error] parameter.

Example: HPT CLI> set CE=y • set $AA = \{y|n\}$

Enable or Disable the [Audible Alarm] parameter.

Example:

HPT CLI> set AA=y

• set RP={0-100}

Change rebuilding priority. If a controller is not specified, this command will set the global rebuilding priority.

Note:

[0-12] Lowest [13-37] Low [38-67] Medium [68-87] High [>88] Highest

Example: HPT CLI> set RP=50

• set SD={minutes}

Set value of [Spindown Idle Disk] [1-10] 10 [11-20] 20 [21-30] 30 [31-60] 60 [61-120] 120 [121-180] 180 [181-240] 240 **Example:** HPT CLI> set SD=10

• set BP={y|n}

Set enable or disable beeper.

Example: HPT CLI> set BP=y

• set FS={Auto|Off|Low|Medium|High}

Change Enclosure Fan Speed.

Example:

HPT CLI> set FS=Medium

• set TT={value}, default=149F

Set temperature threshold.

Example: HPT CLI> set TT=135

• set $TU = \{C|F\}$

Set temperature unit to Celsius equals or Fahenheit equals.

Example: HPT CLI> set TU=C



Set or change your password and confirm it.

Example: HPT CLI> set PS

```
HPT CLI > set PS
Password :*****
Confirm :*****
Password has been changed, please login with your new password.
HighPoint Windows CLI, Please Input
Password:
```

Diag Command

This command allows you to collect the diagnostic information. *Note: This function is only support by Linux & Windows.*

Example:

```
Linux: HPT CLI> diag
HPT CLI>diag
The diagnostic information has been saved in /usr/share/hpt/HighPoint_2021.04.07.
tar.gz
HPT CLI>]
```

Windows: HPT CLI> diag

HPT CLI ≻ diag The diagnostic information will be saved in C:\Program Files (x86)\HighPoint Technologies, Inc\HighPoint RAID Management \Service\webguiroot\HighPoint_rsnvme_1.3.19.0_2021.11.10_16.06.zip.It may take a few minutes to be ready.

The saving path will be displayed after entering this command.

Help Commands

If you input an unknown or error command, you will be told that the command is unknown, you can use help commands to find correct commands.



Syntax

help | help {command}

help

Show generic help about this utility.

Example:

```
HPT CLI> help
HPT CLI > help
help [query|create|delete|OCE/ORLM|rebuild|verify|unplug|switch|lscard
rescan|init|events|mail|task|set|clear|help|exit|diag]
```

help {command}

Show help about a specific command.

Example:

HPT CLI> help create



Exit Command

Syntax

exit

Exit from the interactive mode and close the window.

Clear Commands

Syntax

clear/cls/clr This command is used to clear screen.

Troubleshooting

Debugging an Abnormal RAID status.

Please submit a support ticket using our online service at

Table 1. WebGUI Icon Guide

	Critical – missing disk				
0	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.				
Sec. 1	Verifying				
ofo	The array is currently running a disk integrity check.				
8	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				
0	The array has all disks, but one disk requires rebuilding.				
0	Disabled				
	The icon represents a disabled array, meaning more than one disk failed and the array is				
	no longer accessible				
å	Initializing				
	The array is initializing. The two types of initialization are Foreground and Background.				
U	Uninitialized The energy initialization process has been interpreted, and the process is incomplete				
	Net Initialized				
U	Disk is not initialized yet, and needs to be initialized before use				
L	Legacy				
	An existing file system has been detected on the disk. These disks are classified as legacy				
	drives.				
Im	Normal				
	The array status is normal				
*/	Initializing				
W	The array is initializing, either foreground or background initialization				
U22	Initialization Stopped				
N.	The initialization has been stopped. Current status is uninitialized.				
	Critical – Inconsistency				
W	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				
1	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.

Туре	Description	Min. disks	Usable space	Advantage	Disadvantage	Application
	Disk Striping			Offers the highest performance	No fault tolerance - failure of one	Temporary file,
RAID 0		4 100%		drive results in complete data loss	performance driven application.	
RAID 1	Disk Mirroring	2	50%	Provides convenient low-cost data redundancy for smaller	Useable storage space is 50% of total available capacity. Cap	Operating system, backup, and transaction
				systems and servers	handle 1 disk failure.	database.
RAID10	Striping with Mirroring	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

Table 2. RAID Level Reference Guide

HighPoint Recommended List of NVMe SSDs and Motherboards

HighPoint maintains a list of NVMe SSD's and motherboards suitable for use with NVMe products. The documents are routinely updated and are available for download from the product category webpages.

Contacting Technical Support

FAQ's, technical articles, and trouble-shooting tips are available from our Support web

page

https://www.highpoint-tech.com/support-and-services

If you require technical Support, please submit a support ticket using our Online Support

Service.