HighPoint RAID Management

User's Guide

HighPoint

Revision: 1.0 Date: August 2009 HighPoint Technologies, Inc.

1 - HighPoint RAID Management Utilities (HRM) Installation

The HighPoint RAID Management Utility Suite, also known as "HRM", includes several user interface options. The latest version of the Web Management utility user manual is available from our website.

Mac OS X - Installing the Web-based

Management Utility

The driver and software package for the RocketRAID 4460 includes both the device driver for OS X, and a copy of the Web RAID Management utility. Copy the Mac driver and software package from the Software CD, to the Mac Desktop. Open the .dmg file, and double click "rr3xxx_4xxx" to begin installation.



Click "Continue" to proceed with installation

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mangane =	hptiop_ibm	readme.txt	uninstall.command	and the second s
F PLACES	100	9.A 💡 In	stall HighPoint RR3xxx/4xxx RAID Co	stroller
► SEARCH FOR	-		Welcome to the HighPoint RR3xxx/4xx	RAID Controller Installer
	install_MacOSX_RR3: xx.p0f	noroduction Destination Sele- Installation Summer	You will be guided through the install this software.	steps necessary to

Select the installation destination:

	Select a Destination
	Select the volume where you want to install the HighPoint RR3xxx/4xxx RAID Controller software.
Destination Select Installation Type Installation Summary	MAC 10.5 216 GB available 232 GB total
alaataa aalaataala	Installing this software requires 1.2 MB of space.
I	You have chosen to install this software on the volume "MAC 10.5".

Click "Continue"

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Click "**Restart**" – after OS X reboots, the card will be recognized by the system. Configure arrays using the Web RAID Management interface. User guides for the Web interface are available from http://www.hptmac.com. Check the product page for the RocketRAID 4460, and click on the "Download Center" link.

2 - Starting the Management Interface

Note: To use the web-based RAID management interface, a web browser with XML support is required, e.g. Internet Explorer 6.0+, Mozilla, FireFox, or Safari (for OSX systems).

To run the management interface, start the web browser and enter the access URL.

If you are using the adapter's Ethernet port, please enter http://adapter-ip-address

If you are using in-band management software, please enter http://host-address:7402 Where host-address is the host name or IP address of the host system. Specifically, if you are running the browser on the host system, you can use http://localhost:7402.

The in-band management software provides an access URL for each controller on the system. You can access the RAID management interface for each controller through its access URL.

Controllers Emo	il Setting SNMP Setting	Technologies,Inc.
Controller	HTTP Port	Access URL
Controller 1	7412	http://127.0.0.1:7412
Controller 2	7422	http://127.0.0.1:7422

Then Select the controller's Access URL by click the link

http://127.0.0.1:7412

You will be asked for the User and Password to login. The default user name is

"RAID" and the initial password is "hpt". You can change the

password after you have logged in.

Enter Network Password	×
This secure Web Site (at 127.0.0.1) requires you to log on. Please type the User Name and Password that you use for HighPoir Web RAID Management. User Name RAID Password Save this password in your password list OK Cancel	nt

Note: To use a remote system connection to the web-based RAID management interface, make sure the system's firewall setting has opened for the the In-Band Management service port 7042 and controller's port 7412.

3 – Using RAID Management

Preparing Hard disks

Disks must be initialized before they can be configured into RAID arrays. Normally, disks only have to be initialized once. The disk initialize process should only take a few seconds.

Initializing disks may result in loss – do not initialize disks unless they are to be configured into RAID arrays.

Initializing hard disks:

1) Select the "Manage - Device" function to access the device management page.

2) Click on the "Initialize Devices" button towards the upper portion of the interface screen.



3) Checkmark each disk you wish to initialize, and click the Submit button.

- Andrewson and a second	_				a	9.11-0-1	
Man	age	Event	Task Setting	s 840	00	Technologies.Inc.	
			Initialize P	hysical Devices			
Sel	ect All						
R	-	Device_1	FUIITSU MBA3073R	C-BJLDP7900D7V		73.54 68	
R	5	Device_2	FUIITSU MBA3073R	C-83L0P7700C00		73.54 G8	
P	-	Device_3	FUIITSU MBA3073R	C-03L0P7900D7M	-	73.54 GB	
4	5	Device_*	stoft Internet Explorer		×	73.54 GB	
		9	All data on the array you	selected will be deleted. Do your	ward to contine?		
Subn	1t		C OK	Cancel			
							-
HighPoi	nt Web RAID	Hanagement					
Copyrig	nt (c) 1996-1	2008 HighPoint T	echnologies, Inc. All Right	s Reserved			

Warning: initializing disks may delete data stored on the selected

disks.

Legacy Disks

Disks that already contain data or have been partitioned will be recognized as "Legacy Disks".

Arrays cannot be created from Legacy Disks. These disks would have to be initialized, which may result in data loss.

Array Management

Creating an Array

To create an array:

1. Select "Manage - Array" from the menu.

2. Click the Create Array button. The create array page will appear.

Manage									
		went	Task Set	tings S	HL I	#8	de Politi		2
APTICY						-			
Spare Po	ol		Logical	Device Info	mation				
Name	Туре	Capacity	Cache Policy	BlockSize	SectorSize	OS Name	Status		
Create	Arriky								
-			Physical	Device Info	rmation				
LOC	aton	Model			Capacity	Max Free			
- 1		FUJITS	U MBA3073RC-BJU	0P7900D7V	73.41 68	73.41 GB			
2 2		FUJITS	U MBA3073RC-BJL	0P7700C00	73.41 GB	73.41 GB			
- 1		FUIITS	U MBA3073RC-03L	0P790007M	73.41 GB	73.41 GB			
- 4		FUITS	U MBA3073RE-BJU	0P7700C0G	73.41 68	73.41 68			
Rescan	Beepe	er Mute							
lighPoint W	et RAID P	Management							
Copyright (c) 1996-20	008 HighPoint Te	echnologies, Inc. All	Rights Reserved					
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3. Choose the array type you want to create from the drop-down list.

HighPoint Web RAU	ID Management Create Array - Microsof workes Tools Hein	t Internet Explores			-1012
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Address Nutp://127	0.0.1/7412/arman.cg?func=ShowCreateBuseri	defatio		. 00	Links *
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100		Cr	reate Array	ć	
	Алтаў Туре:	RAID 0			
	Array Name:	RAID 1 RAID 3 RAID 6			
	Initialization Method:	RAID 1/0 RAID 5/0 RAID 5			
	Cache Policy:	JBOD(Volume)	-		
	Black Size:	64K ·			
	Number of RAIDS member disks:	Palask Al			
		Locat	ion Model Capacity Max Free FUJITSU NBA3073RC-BJL0P7900D7V 73.41 GB		- 1
	Available Disks:		FUJITSU NBA3073RC-B3L0P7700C00 73.41 G8 73.41 G8		
		-	FU3ITSU MBA3073RC-83L0P7900D7M 73.41 GB 73.41 GB		
			FUJITSU NBA3073RC-BJL0P7700C0G 73.41 GB 73.41 GB		
	Capacity: (According to the max free	Maximum	(M8)		
Done	1			Trusted sites	

4. Enter a name for the array (this is optional)

5. If you are creating a redundant RAID array (RAID1, 5, 6, 10, 50), select an initialization option for the array.

Note: An un-initialized RAID1 or RAID10 array can still provide redundancy in case of a disk failure. A RAID5 array, however, is not fault-tolerant until initialization is finished.

6. Specify a cache policy:

Write-back

When the write-back setting is selected, writes to the array are cached. This will result in higher performance, but data loss may occur in case of a power failure.

Write-through

When the write-through setting is selected, writes to the array are always passed directly to the disks. Subsequent reads may still be completed from the cache, if appropriate.

None

Neither write-back nor write-through cache is used. I/O data will be passed to disks directly.

7. Select disks from the Available Disks list.

8. Enter a capacity for the array, or use the default value (the maximum capacity for the array).

9. Click Create. If you have specified an initialization option, the initialization process will start automatically.

Deleting an Array

To delete an array:

1) Select "Manage - Array" from the menu.

2) Click on the Maintenance button. An Array Information window will appear.

ess 🔄 http://s	27.0.0.1 7412/arman.cg/userid=RAID	- 5 60	Links
	Managa Event Task Settings SH Televisionary ave		
	Logical Device Information		
	Name Type Capacity Cathe Policy BlockSize SectorSize OS Name Status BAID_5_0 RAID_5_10 RAID 5 319.84 GB Write Bock 64k 5128 HPT DISK 0_0 Normal Heintenence		
	Create Array Information Delete		
	Location & RAID_5_0 1 Charge Cache Policy 8.86 GB		
	2 2 CECORA		
	Rescan Beeger Mate		
	Ngbreint web RAID Management.		
	Copyright (c) 1996-2008 HighPoint Technologies, Inc. All Rights Reserved		

3) Click the Delete button.

Note: An array in use by the operating system cannot be deleted. Any data stored on a deleted array will be inaccessible

Array Maintenance – Rebuilding/Verifying/Modifying RAID arrays

Rebuilding a Failed Array

When an array member in a redundant array fails, the array will be

listed as broken. A broken array will be automatically rebuilt using available-spare disks. However, if you have no spare disks configured, you can still rebuild by manually adding an Available Disk to the array. To add a disk to a broken array:

1) Select menu "Manage - Array".

2) Highlight the desired RAID array

3) Click the "Maintenance" button.

4) Click the "Add Disk" button.

5) If the disk is successfully added to the array, rebuild process will start automatically. A progress bar will be displayed.

Note: If the system utilizes hot-swap capable enclosures, you can add new physical disks to the RocketRAID card in order to rebuild or modify an existing array, using the

"Rescan" feature.

Reminder: When adding disks manually, make sure to initialize the disk (see Preparing Hard Disks).

Only initialized disks can be used to rebuild RAID arrays.

Verifying an Array

For a RAID 1 or RAID1/0 array, verify process compares the data of one mirror pair with the other. For RAID 3, 5 and RAID 6, verify process calculates RAID parity and compares it to the parity data on the array. Verification checks each sector on a drive.

Periodic verification of an array allows the disk drive firmware to take corrective actions on problem areas on the disk, minimizing the occurrence of uncorrectable read and write errors.

To verify an array:

- 1) Select menu "Manage Array".
- 2) Highlight the desired RAID array
- 3) Click the "Maintenance" button.

Click the Verify button to start the verify process.

Other RAID related Functions

Renaming an Array

You are free to rename RAID arrays. This will not harm the array -

data will not be lost.

To rename an array:

1) Select "Manage - Array" from the menu.

2) Highlight the desired RAID array

3) Click on the "Maintenance" button.

4) Enter a new name for the array in the provided field.

5) Click the "Rename" button.

Note: An array running background tasks cannot be renamed.

Unplug

This can be used to safely take an entire array offline while the system remains

operational.

To Unplug an array:

1) Select "Manage - Array" from the menu.

2) Highlight the desired RAID array

3) Click on the "Maintenance" button.

4) Click the "Unplug" button.

5) The software will notify you when it is safe to remove the array.

Note: Make sure the array is not in use before using this command. Active arrays cannot be unplugged.

Device Management

Select the "Manage - Device" function to access the device management page.

Manage	Event	Tosk Settings SHI		Technologies, Inc.
Rescan I	Devices Initi	ialize Devices		
		RocketRAID 4460 Controller		
	Model	WDC WD5000AAKS-22TMA0-WD-WCAPW2931056	Read Ahead	Enabled Change
Device_9	Revision	12.01C01	Write Cache	Enabled Change
	Serial Number	WD-WCAPW2931056		
	Location	9	NCQ	Enabled Change
	Capacity	500.02 GB	Status	Normal
_	Max Free	0.00 GB		
-	Model	WDC WD5000AAKS-22TMAD-WD-WCAPW2785822	Read Ahead	Enabled Change
Device_10	Revision	12.01C01	Write Cache	Enabled Change
	Serial Number	WD-WCAPW2785822		
	Location	10	NCQ	Enabled Change
	Capacity	500.02 GB	Status	Normal
_	Max Free	0.00 GB		_
	Model	WDC WD5000AAKS-22TMAD-WD-WCAPW2931241	Read Ahead	Enabled Change
Device_11	Revision	12.01C01	Write Cache	Enabled Change
	Serial Number	WD-WCAPW2931241		
	Location	11	NCQ	Enabled Change
	Capacity	500.02 GB	Status	Normal
	Max Free	0.00 GB		
-	Model	WDC WD5000AAKS-22TMA0-WD-WCAPW2920313	Read Ahead	Enabled Change
Device_12	Revision	12.01C01	Write Cache	Enabled Change
	Serial Number	WD-WCAPW2920313		
	Location	12	NCQ	Enabled Change

Change Device Settings

Depending upon the capabilities RAID controller and hard disks drives in use, several configurable device settings may be available: Read Ahead, Write Cache, TCQ, and NCQ. Each feature can be enabled or disabled individually, for each hard disk.

Unplug

The Unplug option found below each Device name, can be used to quickly remove (hot-swap) a Legacy disk.

Rescan Devices

When you physically add drives to the controller while the system is running, you can rescan the controller to reflect the change.

To rescan the devices:

1) Select menu "Manage - Device".

2) Click "Rescan Devices" button.

Note: When you are hot-plugging an entire array, run rescan only after all array members (hard disks) have been physically plugged or unplugged from the system.

You can rescan all the devices at once using the Rescan function on the Array Management page.

Extended Information & Update Firmware

The device management page also show the extended information of the RAID controller, such as onboard memory and battery information. User can also use the Web RAID management to upgrade controller's firmware.

Contro	ner 1 (Rocketkald 4400 Controller)	
	Extended Information	
IOP Model:	IOP348 1200MHz SA54.7.3.0	
SDRAM Size:	1024 M	
Battery Installed:	Yes	
Battery MB Installed:	Yes	
Battery Status:	Fully Charged	
Battery Voltage:	Normal	
Battery Temperature:	Normal	
CPU Temperature:	38°C	
Board Temperature:	40°C	
Fan1 Speed:	1564 RPM	
Fan2 Speed:	1608 RPM	
Power 12v Voltage:	11.410	
Power 5v Voltage:	5.134	
Power 3.3v Voltage:	3.280	
Power 2.5v Voltage:	2.512	
Power 1.8v Voltage:	1.760	
Core 1.0v Voltage:	0.992	
Core 1.2v Voltage:	1.200	
DDR 1.8v Voltage:	1.803	
DDR Ref Voltage:	0.864	
Firmware Version:	v1.2.7.24	
	Update Firmware(Controller 1)	_
Select the blf file to update Firmware		
This process may take some time.		
	Browse	
Commit		

User can also use the Web RAID management to upgrade controller's firmware.

SHI - Storage Health Inspector

The primary SHI interface displays a brief "health" summary of each hard disk.

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Location Device Serial Number PAID or Bad Sectors Device Status 1 81.0P790007V None 05 None CK SHART 2 81.0P790007V None 05 None CK SHART 3 81.0P790007M None 05 None CK SHART 4 0.0L0P790000 None 05 None CK SHART 5 81.0P970000 None 05 None CK SHART 6 0.0L0P70000 None 05 None 06 None 06 None 06 None CK SHART 6 0.0L0P70000 None 05 None 06 None				Stora	nge Health	Inspe	ctor(SHI)				
I BLL0P30007/v None 05 None Cit SHART 2 BLL0P30007/h None 95 None Failed SHART 3 BLL0P30007/h None 95 None Cit SHART 4 BLC69700003 None 95 None Cit SHART 4 BLC69700003 None 93 None Cit SHART 5 BLC69700003 None 93 None Cit SHART High disk temperature Threshold (7): [10 Set Set Set		Location	Device Serial Nur	nber	RAID	٥F	Bad Sectors Found & Repaired	Device Stat	tus		
2 BLL0P700C00 None %6 None Failed SHART 3 BLL0P700C00 None %6 SHART 4 BLL0P700C00 None %7 None % State: HDD Temperature Threshold State:		1	BJL0P7900D7V		None	95	None	OK	SMART		
3 BJLDP70007M None 95 None OK <u>SHART</u> 4 BJLDP700C0G None 93 None OK <u>SHART</u> HIDD Temperature Threshold Set harddisk temperature threshold (7): 140 Set Mardiak temperature threshold (7): 140 Kighforit Web RAID Management Capyright (c) 1996-2000 Highforin Technologies, Inc. All Rights Reserved		2	BJL0P7700C00		None	95	None	Failed	SMART		
OLDP7700C0G None II None OK SEART HDD Temperature Threshold set harddisk temperature threshold (5): [12] fighfaint Web RAID Management Copyright (c) 1996-2008 HgdPaint Technologies, Inc. All Rights Reserved		з	BJL0P7900D7M		None	95	None	OK	SMART		
HDD Temperature Threshold Set harddisk temperature threshold (F): [40 Set HighPoint Web RAID Management Copyright (c) 1996-2008 HighPoint Technologies, Inc. All Rights Reserved		+	BJL0P7700C0G		None	93	None	OK	SMART		
Set harddisk temperature threshold (5): 140 Set				HDE	Tempera	ture T	hreshold				
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Controller ID

Which controller /card the disk is attached to.

Port

Port location of the hard disk

Device SSN#

Serial number of the hard disk

RAID

RAID/Non-RAID status

F

Temperature (in Fahrenheit) of the hard disk (Celsius is displayed

under the SMART status)

Bad Sectors/Found & Repaired

The card is capable of repairing bad sectors – a summary of this activity is presented here.

Device Status

OK means the disk is in a healthy state. A Failed status suggests the disk was taken offline (due to a RAID, SMART or sector failure).

Schedule

Click on the blue "Schedule" link to access the Event menu.

S.M.A.R.T Status

You can view S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) data about a

particular hard disk to help troubleshoot problems that occur. You can also setup periodically

S.M.A.R.T. status checking to send notification messages when

S.M.A.R.T. thresholds are exceeded.

Click on the blue "SMART" text to view the SMART status of the hard disk.



Note: S.M.A.R.T attribute data is drive-specific. The software includes a list of definitions for popular drive models/manufacturers. Unknown S.M.A.R.T. attributes will be shown as "unknown". You can add the attribute definitions for your drive in the file smart.def (which resides in the software installation directory).

Configuring Spare Disks

To configure spare disks attached to the RocketRAID card, select the "Manage -Spare" function. The Spare Pool Management page will be displayed.

Man	age	Event	Task	Settings	SHI	Logout	High Point Technologies, Inc.
				_			
				Spare	e Pool		
	≌_	Device_5	HDS72	5050KLA360-KRVI	NO3ZAG63A7D		500.02 GB
Rer	nove Spar	re					
				Availabl	e Disks		
		Device_6	HDS72	5050KLA360-KRVI	P22ZAG0H13C		500.02 GB
		Device_7	HDS72	5050KLA360-KRVI	NO2ZAGOKV1C		500.02 GB
		Device_8	HDS72	DUSUKLA36U-KRVI	222AGUJHUC		500.02 GB
Add	Spare						

Adding a Spare Disk

To add a spare disk, select a disk from the Available Disks list and click the Add Spare button. This will add the disk to the Spare Pool list.

Removing a Spare Disk

To remove a spare disk, select it from the Spare Pool list and click the Remove Spare button. This will remove the disk from the Spare Pool list.

Managing Events and Tasks

The HighPoint Web RAID Management Software automatically logs all controller related events that have occurred (for all controllers/cards managed by the software). In addition you can configure E-mail Notification to receive information about these events (see Settings -View Events).

Events

Tasks executed by the Management Software, or any disk/array errors reported by the card while the OS is active are known as "Events". These events are logged (recorded) by the Management Software. To view logged events, Please select "Event" from the menu. The Event Management page will be displayed.



Click the Clear button to clear the event log.

Click the Next button to see the next page log.

Click the Download button to download log ,opening it in .txt.

Managing Tasks

With the HighPoint RAID Management Software, you can configure and schedule background rebuild and verify tasks to help maintain the integrity of your drives and data.

You can select menu "Task" to enter Task Management page.

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	Tasks List	
	New Verifix Task	
	C PAID 5 0	
	Task	
	Nane: I	
	Cocurs one 2009 - 4 - 21 at 14 : 17 : 54	
	Schedule:	
	Start 2009 - 4 - 21 C End date: 2009 - 4 - 21	
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	date	
	Submit	
	Health Tospector Scheduler	
	Tari Nama-	
	idas ivaline.	
	Select a schedule: C Daily • Weekiy C BHWeekiy C Monthly	
	Select a time: Sunday 1 14 : 17 : 54	
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and I make	a Dana and Information Description Newson	rusted stes

Scheduling a Task

To add a task schedule:

- 1) Select the array that you want to verify or rebuild.
- 2) Enter a name for the task.
- 3) Configure the frequency for the task.
- 4) Check the Submit button.

Delete a Scheduled Task

- To delete a task schedule:
- 1) Select a task from the Tasks List.
- 2) Click the Delete button.

Settings

Select the "Settings" option to access Settings page.

Settings>User

	User Setting				
Password:					
Confirm:					
	Change Pacoword				

This setting allows you to alter the default password (when logging on).

Enter a new password and click the "Change Password" button to change the current user's password.

Settin	gs>Email
--------	----------

	SMT	P Setting
Enable Event Notification		
Server Address (name or IP):	192.168.0.1	
Mail From (E-mail address):	admin@host.com	
Login Name:	admin	
Password:	•••••	
SMTP Port:	25	
Submit Reset		
	Re	cipients
E-mail	Name	Event Level
tester@host.com	tester	Information Warning Error
Delete		
	Add	Recipient
E-mail:]
Name:]
Event Level:	Information Warn	ing Error

Enabling E-mail notification:

To configure E-mail notification:

1) Select the "Enable Event Notification" option.

2) Enter the appropriate information for the SMTP server.

3) Click the "Change Setting" button.

Note: Your SMTP server may require user authentication – enter the appropriate password and username as required.

To add a Recipient:

- 1. Enter the necessary information for the desired recipient.
- 2. Click the Add button.

To test E-mail notification:

1) Enter the necessary information for the recipient.

2) Click the Test button.

If the software is unable to send a test message, an error will be displayed. Double check the recipient entries and make sure the information is correct.

HighPoint In-Band RAID Management Service

User's Guide

HighPoint

Revision: 1.0 Date: August 2009 HighPoint Technologies, Inc.

1 - HighPoint In-Band RAID Management Servicess (HRM) Installation

Mac OS X - Installing the In-Band RAID Management Utility

The driver and software package for the RocketRAID 4460 includes both the device driver for OS X, and a copy of the Web RAID Management utility. Copy the Mac driver and software package from the Software CD, to the Mac Desktop. Open the .dmg file, and double click "rr3xxx 4xxx" to begin installation.



Click "Continue" to proceed with installation



Select the installation destination:

	Select a Destination
	Select the volume where you want to install the HighPoint RR3xxx/4xxx RAID Controller software.
Destination Selec Installation Type Installation Summary	MAC 10.5 216 GB available 232 CB total
unhunhun wilinata	Installing this software requires 1.2 MB of space.
T	You have chosen to install this software on the volume "MAC 10.5".



Click "**Restart**" – after OS X reboots, the card will be recognized by the system. Configure arrays using the Web In-Band RAID Management Service. User guides for the Web Service are available from http://www.hptmac.com. Check the product page for the RocketRAID 4460, and click on the "Download Center" link.

2 - Starting the In-Band RAID

Management Service

Note: To use the In-Band RAID management Service, a web browser with XML support is required, e.g. Internet Explorer 6.0+, Mozilla, FireFox, or Safari (for OSX systems).

To run the RAID management Service, start the web browser and enter the access URL: http://host-address:7402

Where host-address is the host name or IP address of the host system. Specifically, if you are running the browser on the host system, you can use http://localhost:7402.

The in-band management software provides an access URL for each controller on the system. You can access the In-Band management Service for each controller through its access URL.

		Hackpat
Controllers Ema	il Setting SNMP Setting	Technologies, in
Controller	HTTP Port	Access URL
Controller 1	7412	http://127.0.0.1:7412
Controller 2	7422	http://127.0.0.1:7422

Then Select the controller's Access URL by click the link

http://127.0.0.1:7412

You will be asked for the User and Password to login. The default user name is "RAID" and the initial password is "hpt". You can change the password after you have logged in.

Address Inter://127.0.0.1:7412/

OK Cancel

Password

Save this password in your password list

HighPoint In-Band RAID Management User's Guide

Note:

To use a remote system connection to the In-Band RAID In-Band management Service, make sure the system's firewall setting has opened for the In-Band Management service **port 7042** and controller's **port 7412**.

If you are using the adapter's Ethernet port for remote access, please enter http://adapter-ip-address

3 – Using In-Band Management Preparing Hard disks

Disks must be initialized before they can be configured into RAID arrays. Normally, disks only have to be initialized once. The disk initialize process should only take a few seconds. Initializing disks may result in loss – do not initialize disks unless they are to be configured into RAID arrays.

Initializing hard disks:

1) Select the "Manage - Device" function to access the device management page.

2) Click on the "Initialize Devices" button towards the upper portion of the interface screen.

Manage	Event	Task	Setting	SHI	Logout	Help	Technologies, Inc.
Rescan Dev	vices Initia	lize Devices					

3) Checkmark each disk you wish to initialize, and click the Submit button.



Warning: initializing disks may delete data stored on the selected disks.

Legacy Disks

Disks that already contain data or have been partitioned will be recognized as "Legacy Disks". Arrays cannot be created from Legacy Disks. These disks would have to be initialized, which may result in data loss.

Array Management

Creating an Array

To create an array:

- 1. Select "Manage Array" from the menu.
- 2. Click the Create Array button. The create array page will appear.

4.00	usy 👘					_	
Dev	Pool		Logical	Device Infor	mation		
Nam	е Тур	e Capacity	Cache Policy	BlockSize	SectorSize	OS Name	Status
Crei	ate wray	J.					
Crei	ane wrey	3					
Crei	ane Antray		Physical	Device Info	mation		
Crei	Locaton	Mod	Physical	Device Info	rmation Capacity	Max Free	
Crei	Locaton	Moc Fuj	Physical tel 1150 H8A3073RC-830	Device Info	mation Capacity 73.41 GB	Max Free 73.41 GB	
	Location 1 2	Mac Fuz Fuz	Physical foi itsu hiba3073rc-bJU itsu hiba3073rc-bJU	Device Info	mation Capacity 73.41 GB 73.41 GB	Max Free 73.41 GB 73.41 GB	-
	Location 1 2 3	Mac Fuz Fuz Fuz	Physical fel 1150 HBA3073RC-B3U 1150 HBA3073RC-B3U 1150 HBA3073RC-B3U	Device Info 07700074 07700000	mation Capacity 73.41 GB 73.41 GB 23.41 GB	Max Free 73.41 GB 73.41 GB 73.41 GB	

3. Choose the array type you want to create from the drop-down list.

	Cr	eate An	ау	
Аггау Туре:	RAID 0	-		
Array Name:	RAID 1 RAID 3 RAID 5	P		
Initialization Method:	RAID 1/0 RAID 5/0 RAID 5			
Cache Policy:	JBOD(Volume)	_		
Black Size:	64K 💌			
Number of RAID5 member disks:	18			
	Select All	on Model		Capacity Max Free
	0.001	FUITSU	MBA3073RC-BJLO	7900D7¥ 73.41 G8 73.41 GB
Available Disks:	F 🚍 z	FUITSU	HBA3073RC-BILO	7700000 73.41 68 73.41 68
	- m a	FUITTSU	MBA3073RC-BJLOR	790007M 73.41 GI 73.41 GB
		FUITSU	MBA3073RC-BILOR	7700C0G 73.41 GI 73.41 GB

4. Enter a name for the array (this is optional)

5. If you are creating a redundant RAID array (RAID1, 3, 5, 6, 10, 50), select an initialization option for the array.

6. Specify a cache policy:

Write-back

When the write-back setting is selected, writes to the array are cached. This will result in higher performance, but data loss may occur in case of a power failure.

Write-through

When the write-through setting is selected, writes to the array are always passed directly to the disks. Subsequent reads may still be completed from the cache, if appropriate.

None

Neither write-back nor write-through cache is used. I/O data will be passed to disks directly.

7. Select disks from the Available Disks list.

8. Enter a capacity for the array, or use the default value (the maximum capacity for the array).

9. Click Create. If you have specified an initialization option, the initialization process will start automatically.

Deleting an Array

To delete an array:

1) Select "Manage - Array" from the menu.

2) Click on the Maintenance button. An Array Information window will appear.



3) Click the Delete button.

Note: An array in use by the operating system cannot be deleted. Any data stored on a deleted array will be inaccessible

Array Maintenance – Rebuilding/Verifying/Modifying RAID arrays

Rebuilding a Failed Array

When an array member in a redundant array fails, the array will be listed as broken. A broken array will be automatically rebuilt using available-spare disks. However, if you have no spare disks configured, you can still rebuild by manually adding an Available Disk to the array. To add a disk to a broken array:

1) Select menu "Manage - Array".

2) Highlight the desired RAID array

3) Click the "Maintenance" button.

4) Click the "Add Disk" button.

5) If the disk is successfully added to the array, rebuild process will start automatically. A progress bar will be displayed.

Note: If the system utilizes hot-swap capable enclosures, you can add new physical disks to the RocketRAID card in order to rebuild or modify an existing array, using the

"Rescan" feature.

Reminder: When adding disks manually, make sure to initialize the disk (see Preparing Hard Disks).

Only initialized disks can be used to rebuild RAID arrays.

Verifying an Array

For a RAID 1 or RAID1/0 array, verify process compares the data of one mirror pair with the other. For RAID 3, 5 and RAID 6, verify process calculates RAID parity and compares it to the parity data on the array. Verification checks each sector on a drive.

Periodic verification of an array allows the disk drive firmware to take

corrective actions on problem areas on the disk, minimizing the

occurrence of uncorrectable read and write errors.

To verify an array:

1) Select menu "Manage - Array".

2) Highlight the desired RAID array

3) Click the "Maintenance" button.

Click the Verify button to start the verify process.

OCE/ORLM - modifying existing RAID arrays

Expanding/Migrating an Array

With the OCE/ORLM function, you can migrate an array from one

RAID level to another RAID level and/or expand the array

dynamically, even under I/O load. This function implements both

Online Capacity Expansion (OCE) and Online RAID Level Migration (ORLM).

To expand/migrate an array:

1) Select "Manage - Array" from the menu.

2) Highlight the desired RAID array

3) Click the "Maintenance" button.

4) Select the target array type.

5) Click the "OCE/ORLM" button.

6) The OCE/ORLM page will appear. The interface is similar to the array creation wizard:

Note:

A) When expanding a JBOD array, all the original disks must be included in the target array, and these disks must be selected in the same order (as the original array). If you want to migrate a JBOD array to another RAID level, only the first member disk can be included in the target array. For example, a JBOD comprised of 3 disks (1, 2, 3), can only be "migrated" using disk 1. Disks 2 and 3 cannot be used – disk 1 would have to be combined with other disks attached to the RocketRAID card.

B) You cannot change an array to another type of array with a smaller capacity. In some cases, a disk may need to be added to the RocketRAID card.

During the OCE/ORLM procedure, the redundancy level of the array will be the lowest of the source and target arrays; e.g. if you ORLM a RAID0 array to a RAID1 array, the array will be non-redundant until the procedure is complete.

C) The OCE/ORLM process can be aborted and continued at later time. However, you should always stop the transform progress from the In-Band RAID Management software.

An unexpected system crash may result in data loss while performing OCE/ORLM on an array. We strongly recommend backing up data before starting the OCE/ORLM process.

After the OCE/ORLM procedure has completed, reboot the system.

Other RAID related Functions

Renaming an Array

You are free to rename RAID arrays. This will not harm the array – data will not be lost.

To rename an array:

- 1) Select "Manage Array" from the menu.
- 2) Highlight the desired RAID array
- 3) Click on the "Maintenance" button.
- 4) Enter a new name for the array in the provided field.

5) Click the "Rename" button.

Note: An array running background tasks cannot be renamed.

Unplug

This can be used to safely take an entire array offline while the system remains

operational.

To Unplug an array:

1) Select "Manage - Array" from the menu.

2) Highlight the desired RAID array

3) Click on the "Maintenance" button.

4) Click the "Unplug" button.

5) The software will notify you when it is safe to remove the array. *Note: Make sure the array is not in use before using this command.*

Active arrays cannot be unplugged.

Device Management

Select the "Manage - Device" function to access the device management page.

Manage	Event	Task Settings SHI	20	Technologies, Inc.
Rescan I	Devices Init	ialize Devices		
		RocketRAID 4460 Controller		
	Model	WDC WD5000AAKS-22TMA0-WD-WCAPW2931056	Read Ahead	Enabled Change
Device_9	Revision	12.01C01	Write Cache	Enabled Change
	Serial Number	WD-WCAPW2931056		
	Location	9	NCQ	Enabled Change
	Capacity	500.02 GB	Status	Normal
_	Max Free	0.00 GB		augren,
-	Model	WDC WD5000AAKS-22TMA0-WD-WCAPW2785822	Read Ahead	Enabled Change
Device_10	Revision	12.01C01	Write Cache	Enabled Change
	Serial Number	WD-WCAPW2785822		
	Location	10	NCQ	Enabled Change
	Capacity	500.02 GB	Status	Normal
_	Max Free	0.00 GB		
	Model	WDC WD5000AAKS-22TMA0-WD-WCAPW2931241	Read Ahead	Enabled Change
Device_11	Revision	12.01C01	Write Cache	Enabled Change
	Serial Number	WD-WCAPW2931241		
	Location	11	NCQ	Enabled Change
	Capacity	500.02 GB	Status	Normal
	Max Free	0.00 GB		
-	Model	WDC WD5000AAKS-22TMA0-WD-WCAPW2920313	Read Ahead	Enabled Change
Device_12	Revision	12.01C01	Write Cache	Enabled Change
	Serial Number	WD-WCAPW2920313		
	Location	12	NCQ	Enabled Change
		Art. 5		(a.c.) a

Change Device Settings

Depending upon the capabilities RAID controller and hard disks drives in use, several configurable device settings may be available: Read Ahead, Write Cache, TCQ, and NCQ. Each feature can be enabled or disabled individually, for each hard disk.

Unplug

The Unplug option found below each Device name, can be used to quickly remove (hot-swap) a Legacy disk.

Rescan Devices

When you physically add drives to the controller while the system is running, you can rescan the controller to reflect the change.

To rescan the devices:

1) Select menu "Manage - Device".

2) Click "Rescan Devices" button.

Note: When you are hot-plugging an entire array, run rescan only after all array members (hard disks) have been physically plugged or unplugged from the system.

You can rescan all the devices at once using the Rescan function on the Array Management page.

Extended Information & Update Firmware

The device management page also shows the extended information of the RAID controller, such as onboard memory and battery information. User can also use the Web RAID management to upgrade controller's firmware.

	Extended Information	
IOP Model:	IOP348 1200MHz SAS4.7.3.0	
SDRAM Size:	1024 M	
Battery Installed:	Yes	
Battery MB Installed:	Yes	
Battery Status:	Fully Charged	
Battery Voltage:	Normal	
Battery Temperature:	Normal	
CPU Temperature:	38'C	
Board Temperature:	40°C	
Fan1 Speed:	1564 RPM	
Fan2 Speed:	1508 RPM	
Power 12v Voltage:	11.410	
Power 5v Voltage:	5.134	
Power 3.3v Voltage:	3.280	
Power 2.5v Voltage:	2.512	
Power 1.8v Voltage:	1.760	
Core 1.0v Voltage:	0.992	
Core 1.2v Voltage:	1.200	
DDR 1.8v Voltage:	1.803	
DDR Ref Voltage:	0.864	
Firmware Version:	v1.2.7.24	
	Update Firmware(Controller 1)	
elect the bif file to undate Firmware		
his process may take some time.		
	Browso	
	Diowse	

User can also use the Web RAID management to upgrade controller's firmware.

SHI - Storage Health Inspector

The primary SHI interface displays a brief "health" summary of each hard disk.

Manage	Event	Task	Settings			Technol	Dollat ogies,inc.
							Schedule
		Stor	age Health	Inspe	ctor(SHI)		
Location	Device Serial Nu	mber	RAID	oF	Bad Sectors Found & Repaired	Device Sta	tus
1	BJL0P7900D7V		None	95	None	OK	SMART
2	BJL0P7700C00		None	95	None	Failed	SMART
3	BJL0P7900D7M		None	95	None	OK	SMART
4	BJL0P7700C0C		None	90	None	OK	SHART
-		HD	D Tempera	ture T	hreshold		
Set harddis	temperature thre	shold (F): 14	0		Set		

Controller ID

Which controller /card the disk is attached to.

Port

Port location of the hard disk

Device SSN#

Serial number of the hard disk

RAID

RAID/Non-RAID status

F

Temperature (in Fahrenheit) of the hard disk (Celsius is displayed under the SMART status)

Bad Sectors/Found & Repaired

The card is capable of repairing bad sectors – a summary of this activity is presented here.

Device Status

OK means the disk is in a healthy state. A Failed status suggests the disk was taken offline (due to a RAID, SMART or sector failure).

Schedule

Click on the blue "Schedule" link to access the Event menu.

S.M.A.R.T Status

You can view S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) data about a particular hard disk to help troubleshoot problems that occur. You can also setup periodically S.M.A.R.T. status checking to send notification messages when

S.M.A.R.T. thresholds are exceeded.

Click on the blue "SMART" text to view the SMART status of the hard disk.

Manage	Event	Task	Settings	SHI	-	Technologies	enter Anter		
							ichedule		
		Sto	rage Health	Inspect	or(SHI)				
Location	Device Serial N	lumber	RAID	۰F	Bad Sectors Found & Repaired	Device Status			
1	BJL0P7900D7V		None	95	None	OK	SMART		
2	B3L0P7700C00		None	95	None	Failed	SMART		
3	B3L0P7900D7M		None	95	None	OK	SMART		
4	BJL0P7700C0G		None	93	None	OK	SMART		
-	ame	Device_1							
Model Ne	umber	FUIITSU	MBA3073RC-BILI	0P7900D7V					
Exceptio	n Control and Warn	ing Disabled							
E		s	CSI S.M.A.F	.T Attri	outes				
ID	Name				Talu	ie			
300	Read errors correcte	ed by ECC har	dware method		0				
301	Read errors corrects	ed with possib	le delays		1				
302	Total read errors				0				
303	Total read errors co	rrected			0				
305	Total bytes read				2965	58586980864			
306	Total uncorrected re	ad errors			0				
200	Write errors correct	ed without su	bstantial delay		0				
901	Write errors correct	ed with possil	le delavs						

Note: S.M.A.R.T attribute data is drive-specific. The software includes a list of definitions for popular drive models/manufacturers. Unknown S.M.A.R.T. attributes will be shown as "unknown". You can add the attribute definitions for your drive in the file smart.def (which resides in the software installation directory).

Configuring Spare Disks

To configure spare disks attached to the RocketRAID card, select the "Manage -Spare" function. The Spare Pool Management page will be displayed.

Mana	aqe	Event	Task	Settings	SHI	Logout	Technologies, Inc.
				Spare	: Pool		
	9	Device_5	HDS725	050KLA360-KRVI	N03ZAG63A7D		500.02 GB
Rer	nove Spar	e					
				Availabl	e Disks		
		Device_6	HDS725	050KLA360-KRVI	P22ZAGOH13C		500.02 GB
		Device_7	HDS725	050KLA360-KRVI	N02ZAGOKV1C		500.02 GB
		Device_8	HDS/25	USUKLA36U-KRVI	P22ZAGUJHUC		500.02 GB
Add	Spare						

Adding a Spare Disk

To add a spare disk, select a disk from the Available Disks list and click the Add Spare button. This will add the disk to the Spare Pool list.

Removing a Spare Disk

To remove a spare disk, select it from the Spare Pool list and click the Remove Spare button. This will remove the disk from the Spare Pool list.

Managing Events and Tasks

The HighPoint Web In-Band RAID Management Software automatically logs all controller related events that have occurred (for all controllers/cards managed by the software). In addition you can configure E-mail Notification to receive information about these events (see Settings -View Events).

Events

Tasks executed by the Management Software, or any disk/array errors reported by the card while the OS is active are known as "Events". These events are logged (recorded) by the Management Software. To view logged events, Please select "Event" from the menu. The Event Management page will be displayed.

Manage	Event Tack	Settings SL		HeftsPoint
Download Cie	ar Next			- reconnologies.the.
		Event View (1	0	
Туре	Date Time	Description		
Information	2002/01/13 06:50:20	Disk 'Device_1' (Location: a	L) has been removed fro	om spare pool successfull
Information	2002/01/13 06:49:27	Disk 'Device_2' (Location: 2	?) has been removed fro	im spare pool successfully
Information	2002/01/13 06:47:42	Disk 'Device_2' (Location: 2	e) has been put into spa	are pool successfully.
Information	2002/01/13 06:47:42	Disk 'Device_1' (Location: 1	() has been put into spa	we pool successfully.
Information	2009/04/20 14:43:18	RAID 5 Array 'RAID_5_0' ha HDS72101-GTH000PAG 31- 2: Disk 3:Htachi HDS72101 GTA000PAG06MEA, 4).	as been created success 4H, 1; Disk 2:Hitachi HD 1-GTAOODPAGO6TPA, 3; I	sfully (Disk 1:Hitachi 572131-GTH000PAG 33 H Disk 4:Hitachi HDS72101-
Information	2009/04/20 14:43:04	Array 'RAID_5_0' has been	deleted successfully.	
Information	2009/04/20 14:43:01	Array 'RAID_5_0' has been	deleted successfully.	

Click the Clear button to clear the event log.

Click the Next button to see the next page log.

Click the Download button to download log ,opening it in .txt.

Managing Tasks

With the HighPoint In-Band RAID Management Software, you can configure and schedule background rebuild and verify tasks to help maintain the integrity of your drives and data.

You can select menu "Task" to enter Task Management page.



Scheduling a Task

To add a task schedule:

- 1) Select the array that you want to verify or rebuild.
- 2) Enter a name for the task.
- 3) Configure the frequency for the task.
- 4) Check the Submit button.

Delete a Scheduled Task

To delete a task schedule:

- 1) Select a task from the Tasks List.
- 2) Click the Delete button.

Settings

Select the "Settings" option to access Settings page.

Manage	Event	Task	Settings	SHI	Logout	Technologies, Inc.
			System User	Network Email		
			SNMP	NTP		

Settings>System

	Syster	n Setting
SAF-TE Config File	no config file	~
Audible Alarm	Enabled	
Staggered Spinup	Disabled 🛩	
Spin down idle disk (minutes)	Disabled 💌	
Rebuild Priority:	Medium 🔛	
Auto Rebuild	Disabled 💌	
Continue Rebuilding on Error	Disabled 💌	
INT 13 Support	Enabled	
NCQ	Enabled 💌	
Adapter Mode	RAID adapter mode	~
Submit Reset		

The System Setting page include SAF-TE config file setting, Audible

Alarm setting,

Staggered Spinup setting, Spindown Idle Disk setting, Rebuild priority setting and

Auto Rebuild setting.

The Upload SAF-TE config file option allow user to upload the

special SAF-TE config files.

Adapter Mode- Option

Adapter Mode

Submit Reset

RAID adapter mode	*
RAID adapter mode	
Mixed mode	
Non-RAID adapter mode	

RAID adapter mode: This is the standard RAID controller mode. *Mixed mode*: All unused single disks will be set as Legacy mode and reported to OS as single disks.

Non-RAID adapter mode: All disks attached to the controller will be set as Legacy mode and reported to OS as single disks.

(**Note:** Make sure you have backup the data on the original RAID array before using the Non-RAID adapter mode.)

Settings>Network

	Network Setting
DHCP	Disabled 💌
IP Address	192 . 9 . 200 . 251
Subnet Mask	255 .255 .0
IP broadcast	255 .255 .255
Gateway	192 .9 . 200 .103
DNS Server	
Current IP Address	192.9.200.251
Current Subnet Mask	255.255.255.0
Current Gateway	192.9.200.103
Current DNS Server	
Ether Net MAC Address	s 00:19:3c:00:00:00
Submit Reset	

This page allow user to adjust the onboard LAN values.

Settings>User

User Setting					
Password:					
Confirm:					
Change Password					

This setting allows you to alter the default password (when logging on).

Enter a new password and click the "Change Password" button to

change the current user's password.

Settings>Email

HighPoint In-Band RAID Management User's Guide

	SMI	[P Setting
Enable Event Notification		
Server Address (name or IP):	192.168.0.1	
Mail From (E-mail address):	admin@host.com	
Login Name:	admin	
Password:	••••••]
SMTP Port:	25	
Submit Reset		
	Re	cipients
E-mail	Name	Event Level
tester@host.com	tester	Information Warning Error
Delete		
	Add	Recipient
E-mail:]
Name:]
Event Level:	Information 🗌 Warr	ning Error

Enabling E-mail notification:

To configure E-mail notification:

- 1) Select the "Enable Event Notification" option.
- 2) Enter the appropriate information for the SMTP server.
- 3) Click the "Change Setting" button.

Note: Your SMTP server may require user authentication – enter the appropriate password and username as required.

To add a Recipient:

- 1. Enter the necessary information for the desired recipient.
- 2. Click the Add button.

To test E-mail notification:

- 1) Enter the necessary information for the recipient.
- 2) Click the Test button.

If the software is unable to send a test message, an error will be displayed. Double check the recipient entries and make sure the information is correct.

Settings>SNMP

You can set three SNMP Trap IP address and trap type, this setting will be saved in the flash. While the corresponding type of events generated, the adapter will send SNMP Trap Messages to the designated Trap Receiver through its Ethernet interface.

		SNM	P Config	uratio	ns
SNMP Trap IP Address #1				Port #	162
SNMP Trap IP Address #2				Port #	162
SNMP Trap IP Address #3				Port #	162
Trap Type	Information	Warni	ng 🗌 Error		
	Submit Reset]			

If you do not use the adapter's Ethernet interface, you can setup the SNMP configuration in the In-Band Management Service configuration page. In this case, the in-band management service will send SNMP Trap messages through the network interface of the host computer.

Settings>NTP

	NTP Server Configurations	
NTP Server IP Address #1		
NTP Server IP Address #2		
Time Zone	(GMT-12:00)International Date Line West	
Current Time	2008-01-08 11:53:21	
	Submit Reset	

You can check the current firmware time and setup two NTP time server addresses and

select the time zone. The adapter will keep its clock synchronized with time sever.

Note: To use the NTP feature you must setup the Ethernet port of the adapter.