RocketRAID Series Data RAID Set Up Guide

Products:

RocketRAID	4522 and 4520
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- RocketRAID 3740A and 840A
- RocketRAID 2760A
- RocketRAID 2740 and 2744
- RocketRAID 2722, 2721 and 2711

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Overview

This installation guide provides step and step instructions on how to configure the RocketRAID mini-SAS 6G storage to support a Data RAID. This guide also provides troubleshooting tips when problems occur.

Part 1. What is a Data RAID?

A Data RAID is setting up a RAID array (0, 1, 5, 6, 10,50 or JBOD) on the RocketRAID mini-SAS 6G series controller.

RAID arrays offers advantages of performance and protection with redundancy.

RAID Basics?

RAID stands for Redundant Array of Independent Drives. This means taking multiple matching drives and arranging them together to achieve large storage space, speed, data protection, or any combination of the three. The RocketRAID mini-SAS 6G series controller supports the following RAID types:

RAID 0 "Stripe"

Speed: Data is alternated across two or more drives to gain speed by essentially distributing the workload.

Protection: No built-in protection.

Capacity: Usable space is the combined capacity of all the drives.

RAID 5 "Stripe & Protection"

Speed: Data is striped like in a RAID 0, so significant speed gains are seen.

Protection: Utilizes mathematical parity to achieve data protection while taking up a minimum of space. One drive can fail and all data will still be accessible.

Capacity: All but one drive worth of capacity is usable. Minimum three drives are needed to create a RAID 5 array. In a three drive RAID 5 array, there is two drives worth of usable space.

RAID 6 "Enhanced RAID5"

Speed: Data is striped like in a RAID 0, so significant speed gains are seen.

Protection: Utilizes mathematical parity to achieve data protection while taking up a minimum of space. Two drives can fail and all data will still be accessible.

Capacity: All but two drives worth of capacity is usable. Minimum four drives are needed to create a RAID 6 array. In a four drives RAID 6 array, there is two drives worth of usable space.

Combined RAIDs: RAID 10/50

Speed: Combines multiple RAID 1 or RAID 5 sets by using RAID 0 "Striping" to gain speed.

Protection: There are two RAID 1 or 5 "Mirrored" sets used in order to tolerate 1-2 drives failing depending on which drives they are.

Capacity: For RAID 10 its usable space is half of the combined capacity of all the drives used, while for RAID 50 its usable space is each RAID5 capacity*RAID5 number.

RAID 1 "Mirror"

Speed: No speed benefits gained. Protection: One drive can fail and all data will still be accessible.

Capacity: One drive worth of usable space out of the two total drives used.

JBOD (Independent Drive Modes)

Speed: No significant speed gains. ☑

Protection: No built-in data protection.

Capacity: In JBOD mode, the capacities are combined. When set up as independent drives, each drive presents its stated capacity for use.

Part 2. Pre-Requisite for Data RAID Configuration

The RocketRAID mini-SAS 6Gb/s series controller support Data RAID configurations include RAID 0, 1, 5, 10 arrays. This document will include the installations steps to configure and setup your hardware to support Data RAID arrays.

The hardware and software pre-requests are listed below:

- RocketRAID mini-SAS 6Gb/s series HBA
- RocketRAID mini-SAS 6Gb/s for Mac drivers
- Mac Pro system 2006 to Present
- RocketStor 6414S, RocketStor 6418S, NA381TB, NA333TB, NA211TB-LD, NA211TB
- Enterprise/NAS level disk drives (Drive Compatibility List)
- Mac OS X 10.6.x and above

System Requirements

Mac Pro Hardware: Intel-based Mac with an available PCIe 2.0 or 1.0 slot capable of supporting an x8 (8-lane) length PCIe card. For optimal performance, use a PCIe 2.0 slot running at x8 speeds or greater.

Slot recommendations for the RocketRAID mini-SAS 6G series controller.

Operating System: Mac OS X 10.6.x

Before, installing the RocketRAID mini-SAS 6G series controller make sure the computer is turned off and unplugged from its power source. Take appropriate electrostatic discharge precautions:

Your computer is a static-sensitive device. It is susceptible to invisible damage if not protected during installation.

We recommend proper grounding by using a grounding strap. Make sure to work in a clean and static-free area, and avoid wearing clothing that retains static charges.

Part 3. Hardware Installation and Verification

Before installing the RocketRAID mini-SAS 6G series controller

- Make sure computer is turned off and unplugged from its power source.
- Take appropriate electrostatic discharge precaution.
- Remove the PCIe slot cover.
- Gently insert the RocketRAID mini-SAS 6G series controller into the PCIe slot and secure the bracket to the computer chassis according to your chassis specifications.
- After installing the RocketRAID mini-SAS 6G series controller, restart your computer. After your computer has started, insert the Driver & Software Installation Disc to install the necessary drivers for your computer's operating system.

Hardware Verification

Verifying the RocketRAID mini-SAS 6G series controller is installed into the Mac Pro system:

Step 1: Click on About this Mac

Step 2: Click on More Info

Step 3: Click on System Report

Step 4: Click on PCI Cards

Step 5: The RocketRAID mini-SAS 6G series controller will be identified as RAID Controller.

Step 6: Verify the RocketRAID mini-SAS 6G HBA is detected and no drivers are installed.

In Mac OS X 10. x ,the Driver Installed will be "No".

Once you have verified that the RocketRAID mini-SAS 6G series controller is detected you can proceed to the Driver and Software Installation. The following screenshot is an example of RR2760 HBA

		м	ac Pro				
▼ Hardware	Card			~	Туре	Driver Installed	Slot
ATA	ATI Radeon HD 5770				Display Controller	Yes	Slot-1
Audio	pci1103,2760				RAID Controller	No	Slot-3@6,0,0
Bluetooth	pci1103,2760				RAID Controller	No	Slot-3@7,0,0
Camera	pci1103,2760				RAID Controller	No	Slot-3@8,0,0
Card Reader							
Diagnostics							
Disc Burning							
Ethernet Cards			0)			
Fibre Channel	pci1103,2760:						
FireWire	Tuno	DAID Controllor					
Graphics/Displays	Driver Installed:	No					
Hardware RAID	MSI:	No					
Memory	Bus:	PCI					
NVMExpress	Slot:	Slot-3@6,0,0					
PCI	Vendor ID: Device ID:	0x1103					
Parallel SCSI	Subsystem Vendor ID:	0x1103					
Power	Subsystem ID:	0x0000					
Printers	Revision ID:	0x0003					
SAS	Link Width:	x8					
SATA/SATA Express	Link Speed:	5.0 G I/S					
SPI							
Storage							

Troubleshooting Tip: If the RocketRAID mini-SAS 6G series controller is not detected

please try the following troubleshooting tips.

- **Step 1.** Shut down the Mac Pro system then remove and insert the RocketRAID mini-SAS 6G series controller then follow the steps from Hardware Verification.
- **Step 2.** If Step 1 fails, then insert the RocketRAID mini-SAS 6G series controller into a different PCIe slot.
- **Step 3.** If Step 2 fails, try the RocketRAID mini-SAS 6G series controller in another Mac Pro system.

Part 4. Driver and Software Installation

The RocketRAID mini-SAS 6G series controller comes with a disc containing the drivers and software for Mac Pro system. For the latest drivers and software visit the product page for the RocketRAID mini-SAS 6G series controller on

http://www.hptmac.com/

Mac OS X 10. x

Once you have installed the RocketRAID mini-SAS 6G series controller and booted into your Mac, follow these instructions to install the drivers and the RocketRAID mini-SAS 6G series controller software:

- **1.** Download the Mac software package from the product page.
- **2.** Double-click on the file to mount the image containing the Mac OS X software and drivers.
- **3.** Double-click on the installer package to start the installation process.
- **4.** Follow the on-screen steps to complete the installation process and you will be prompted to restart your computer.

Verify Software Installation

- Step 1. Click on About this Mac
- Step 2. Click on More Info
- **Step 3.** Click on System Report
- Step 4. Click on PCI Cards
- **Step 5.** The RocketRAID mini-SAS 6G series controller will be identified as PCI RAID Controller.
- **Step 6.** Verify the RocketRAID mini-SAS 6G HBA is detected and Driver Installed is "Yes".

		N	lac Pro				
▼ Hardware	Card			^	Туре	Driver Installed	Slot
ATA	ATI Radeon HD 5770				Display Controller	Yes	Slot-1
Audio	pci1103,2760				RAID Controller	Yes	Slot-3@6,0,0
Bluetooth	pci1103,2760				RAID Controller	Yes	Slot-3@7,0,0
Camera	pci1103,2760				RAID Controller	Yes	Slot-3@8,0,0
Card Reader							
Diagnostics							
Disc Burning							
Ethernet Cards	pci1103,2760:			-			
Fibre Channel							
Graphics/Displays	Type:	RAID Controller					
Hardware PAID	Driver Installed:	Yes					
Memory	Bus:	PCI					
NVMExpress	Slot:	Slot-3@6,0,0					
PCI	Vendor ID:	0x1103					
Parallel SCSI	Subsystem Vendor ID:	0x2760 0x1103					
Power	Subsystem ID:	0x0000					
Printers	Revision ID:	0x0003					
SAS	Link Width:	X8 5.0 GT/s					
SATA/SATA Express	Link opeed.	5.0 0 1/3					
SPI							
Storage							
Thunderbolt							
USB							
▼Network							

For Mac 10.x the driver and WebGUI are in one package so once Driver Installed is verified as "Yes", the WebGUI will also need to be installed. You can just start the browser to log in WebGUI.

Troubleshooting Tip: If the after installing the software package and the Driver Installed is still "No", please try the following troubleshooting tips.

- **Step 1.** Confirm that you have the RocketRAID mini-SAS 6G series controller software package and not another HighPoint RocketRAID series controller that support Mac OS X.
- **Step 2.** Run the uninstall script, reboot the Mac Pro system and reinstall the RocketRAID mini-SAS 6G series controller software once more.

Part 5. Ready to Experience RAID Management WebGUI

Log into the WebGUI by entering opening a browser and entering the following URL: <u>https://localhost:7402</u>

Troubleshooting Tip: If you are not able to login to the URL, please check previous troubleshooting steps to verify that the driver is install and that the RocketRAID mini-SAS 6G series controller is detected.

Note: make sure to use the latest S/W package from website.

Controller(1): 276x ᅌ					Hig	hPoint Technologies, I
Global View	Physical	Logical	Setting Event	SHI Reco	over Logout	Help
Create Array			Logical De	vice Informatio	n	
Spare Pool	Name	Туре Сара	acity BlockSize	SectorSize	OS Name	Status
Logical Device						
Rescan			Physical De	vice Informatio	on	
phPoint RAID Manager pyright (c) 1996-2015	nent 2.6.20 HighPoint Tecl	nnologies, Inc. Al	Rights Reserved			

Creating a Data RAID

Once you have logged into the web GUI you are ready to create a Data RAID. You will see all of the hard drives attached to the RocketRAID mini-SAS 6G series controller.

Step 1. Examine available hard drives attached to the RocketRAID mini-SAS 6G series controller for Data RAID configuration.

Controller(1): 276x ᅌ						High	Point Technologies, Inc
Global View	Physical	Logi	cal <mark>Se</mark>	etting Event	SHI Reco	over Logout	Help
Create Array				Logical Dev	ice Informatio	n	
Spare Pool	Name	Туре	Capacity	BlockSize	SectorSize	OS Name	Status
Logical Device							
Create Array				Logical Dev	ice Informatio	n	
Spare Pool	Name	Туре	Capacity	BlockSize	SectorSize	OS Name	Status
Logical Device							
Rescan				Physical Dev	vice Informatio	on	
Beeper Mute	Locati	on Mod	el			Capacity	Max Free
	1/9	ocz	-VERTEX2-0	CZ-2FYZO042MEC8	GQK2	59.92 GB	59.92 GB
	1/10	ocz	-SOLID3-OC	Z-WDAZQ2QHQ77Y	0790	59.92 GB	59.92 GB
	1/11	ocz	-SOLID3-OC	Z-U7N46S91212588	31E	59.92 GB	59.92 GB
	1/12	ocz	-SOLID3-OC	Z-RYB5182H37FW8	BT9A	59.92 GB	59.92 GB
	1/13	Sam	sung SSD 8	40 EVO 250GB-S1D	BNSADB84985R	249.98 GB	249.98 GB
	1/14	KIN	GSTON SSD	NOW 30GB-30PM10	ORM83Z	29.93 GB	29.93 GB
	1/15	Sam	sung SSD 8	50 PRO 256GB-S15	WNSAFB01508H	255.95 GB	255.95 GB
	1/16	C30	0-CTFDDAC	256MAG-00000000	L1020301B372	255.95 GB	255.95 GB

Step 2. Select the type of Data RAID you want to create RAID levels (0,1,5,6,10,50 and JBOD) are supported.

Global View	Physical Logical	Setting	Event	SHI	Recover	Logout	Help
Create Array			Creat	te Array			
Spare Pool	Arrow Types	JBOD(Volume)					
ogical Device	Array Type:	RAID 0					
Beseen	Array Name:	RAID 5					
Rescan	Initialization Method:	RAID 1/0 RAID 5/0	1				
Beeper Mute	Casho Dalianu	Malas Deals	~				
	Cache Policy:	write Back	×				
	Block Size:	64K	٥				
	Number of RAID5 member disks:	3	0				
		Select All	Location	Model		Capacity	Max Free
		0	1/9	OCZ-VERTE	X2-OCZ-	59.92 GB	59.92 GB
			= 1/10	OCZ-SOLID	3-OCZ-	59 92 GB	59 92 GB
		0		WDAZQ2QI	1Q77Y079U	55.52 00	35.52 00
			1/11	U7N465912	125881E	59.92 GB	59.92 GB
			1/1 2	RYB5182H	3-0CZ- 37FW8T9A	59.92 GB	59.92 GB
	Available Disks:		I/13	Samsung S 250GB- S1DBNSAD	SD 840 EVO B84985R	249.98 GB	249.98 GB
			1/1 4	KINGSTON 30GB-30PM	SSDNOW 100RM83Z	29.93 GB	29.93 GB
			= 1/15	Samsung S 256GB- S1SWNSAF	SD 850 PRO 801508H	255.95 GB	255.95 GB
			1/16	C300-CTFD	DAC256MAG- 1020301B37	2 255.95 GB	255.95 GB
	Capacity: (According to						
	the max free space on	Maximum	(MB)				

Step 3. Select the hard drives attached to the RocketRAID mini-SAS 6G series controller and click the **Create** button.

Global View	Physical Logical	Setting	Event	SHI	Recover	Logout	Help
Create Array			Creat	te Array			
Spare Pool	Array Type:	RAID 0	\$				
ogical Device.	Array Name:	Default	_				
lescan	Taitialiantian Mathada						
eeper Mute	Initialization Method:	Keep Old Data	\$				
	Cache Policy:	Write Back	٢				
	Block Size:	64K	\$				
	Number of RAID5 member disks:	3	٥				
		Select All	Location	Model		Capacity	Max Free
			1/9	OCZ-VERTE	EX2-OCZ- MEC8GOK2	59.92 GB	29.99 GB
			1/10	OCZ-SOLIE WDAZQ2Q	3-OCZ- HQ77YO79U	59.92 GB	29.99 GB
			I/11	OCZ-SOLID	03-OCZ- 2125881E	59.92 GB	29.99 GB
	Available Disks:		1/12	OCZ-SOLIE RYB5182H	3-0CZ- 37FW8T9A	59.92 GB	29.99 GB
			= 1/13	Samsung S 250GB- S1DBNSAD	SD 840 EVO 884985R	249.98 GB	220.04 GB
			1/15	Samsung S 256GB- S1SWNSAF	B01508H	255.95 GB	226.02 GB
			1/16	C300-CTFD	DAC256MAG- 1020301B37	255.95 GB	226.02 GB
	Capacity: (According t	0					
	the max free space or	n Maximum	(MB)				

Step 4. Confirmation that the Data RAID is created.

							High	<i>t</i>Poin Technologies,
Global View	Physical L	ogical	Setting	Event	SHI	Recover	Logout	Help
reate Array			Lo	gical Dev	vice Info	rmation		
pare Pool	Name	Туре	Capacity	BlockSize	SectorSize	OS Name	Status	
ogical Device	V RAID_0_0	RAID 0	239.44 GB	64k		HPT DISK 3_0	Normal	Maintenance
lescan								
eeper Mute			Phy	sical De	vice Info	rmation		
	Location	Model					Capacity	Max Free
	1/9	OCZ-VERT	EX2-OCZ-2F	YZO042MEC	BGQK2		59.92 GB	29.99 GB
	1/10	OCZ-SOLI	D3-OCZ-WD	AZQ2QHQ77	Y079U		59.92 GB	29.99 GB
	1/11	OCZ-SOLI	D3-OCZ-U7N	4659121258	381E		59.92 GB	29.99 GB
	1/12	OCZ-SOLI	D3-OCZ-RYB	5182H37FW	/8T9A		59.92 GB	29.99 GB
	1/13	Samsung	SSD 840 EV0	250GB-S1	DBNSADB849	985R	249.98 GB	220.04 GE
	1/14	KINGSTO	N SSDNOW 3	OGB-30PM1	00RM83Z		29.93 GB	0.00 GB
	1/15	Samsung	SSD 850 PR	0 256GB-S1	SWNSAFB01	508H	255.95 GB	226.02 GI

Global View Physical Log	gical Setting	Event	SHI	Recove	r Logout	t Help
Create Array	Log	jical Dev	ice Infor	mation		
Spare Pool Name T Logical Device RAID_0_0 F	Type Capacity RAID 0 239.44 GB	BlockSize 64k	SectorSize	OS Name	Status _0 Normal	Maintenance
Rescan		C	Disk Utility			
Beeper Mu				0		
	First	Aid Partition	Frase Mo	ount Info		
Internal WDC WD2002FAE 10.8 10.11.x	Era sto for	ase "HPT DI sing "HPT DIS red on it. Enter mat.	ISK 3_0 Media" v K 3_0 Media" v r a name, choo	ia"? vill destroy of se a partition	all the data map and	
Internal WDC WD2002FAE 10.8 10.11.x new 10.10 External HPT DISK 3_0 Media	Name: Format: Scheme	ase "HPT DI sing "HPT DIS red on it. Enter mat. RocketRAID OS X Exter GUID Parti	ISK 3_0 Med ISK 3_0 Media" v r a name, choo 0 mini-SAS 60 nded (Journa tion Map	ia"? vill destroy of se a partition G led) Cancel	all the data map and C C Erase	
Internal WDC WD2002FAE 10.8 10.11.x new 10.10 External HPT DISK 3_0 Media	Fire Store S	ase "HPT DI sing "HPT DIS red on it. Enter mat. RocketRAID OS X Exter GUID Parti	ISK 3_0 Med ISK 3_0 Media" v r a name, choo 0 mini-SAS 60 nded (Journa tion Map	ia"? vill destroy of se a partition G led) Cancel	all the data map and	239.44 GB
Internal WDC WD2002FAE I0.8 I0.11.x I0.10 External HPT DISK 3_0 Media	Er Era sto for Name: Format: Scheme	ase "HPT DI sing "HPT DIS red on it. Enter mat. RocketRAID OS X Exter GUID Parti	ISK 3_0 Med ISK 3_0 Media" v r a name, choo 0 mini-SAS 60 nded (Journa tion Map	ia"? vili destroy of se a partition G led) Cancel SCSI Chi	all the data map and	239.44 GB 0
Internal WDC WD2002FAE I0.8 I0.11.x I0.10 External IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Er Era sto for Name: Format: Scheme Connection: Partition Map:	ase "HPT DI sing "HPT DIS red on it. Enter mat. RocketRAID OS X Exter GUID Parti	ISK 3_0 Med ISK 3_0 Media" v r a name, choo 0 mini-SAS 60 nded (Journa tion Map	ia"? vili destroy of se a partition G led) Cancel SCSI Chi Typ	all the data map and	239.44 GB 0 Disk

Step 5. Format the newly created partition.