

## **RAID Manual**

## 5.1 Setting up RAID

The motherboard supports the following SATA RAID solutions:

- LSI MegaRAID software RAID Configuration Utility with RAID 0, RAID 1, and RAID 10 support (for both Linux and Windows OS).
- Intel<sup>®</sup> Rapid Storage Technology enterprise Option ROM Utility with RAID 0, RAID 1, RAID 10, and RAID 5 support (for Windows OS only).

## 5.1.1 RAID definitions

**RAID 0** (*Data striping*) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

**RAID 1** (*Data mirroring*) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

**RAID 10** is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

**RAID 5** stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.



- If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support DVD to a floppy disk before you install an operating system to the selected hard disk drive.
- Please refer to chapter 2 for how to select the RAID configuration utility. Move the jumper to choose between LSI MegaRAID and Intel<sup>®</sup> Rapid RAID.

## 5.1.2 Installing hard disk drives

The motherboard supports Serial ATA for RAID set configuration. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for RAID configuration:

- 1. Install the SATA hard disks into the drive bays following the instructions in the system user guide.
- Connect a SATA signal cable to the signal connector at the back of each drive and to the SATA connector on the motherboard.
- 3. Connect a SATA power cable to the power connector on each drive.

## 5.1.3 Setting the RAID item in BIOS

You must set the RAID item in the BIOS Setup before you can create a RAID set from SATA hard disk drives attached to the SATA connectors supported by Intel<sup>®</sup> C612 chipset. To do this:

- 1. Enter the BIOS Setup during POST.
- 2. Go to the Advanced Menu > PCH SATA Configuration, then press <Enter>.
- 3. Set SATA Mode to [RAID Mode]
- 4. Press <F10> to save your changes and exit the BIOS Setup.



Refer to Chapter 4 for details on entering and navigating through the BIOS Setup.

## 5.1.4 RAID configuration utilities

Depending on the RAID connectors that you use, you can create a RAID set using the utilities embedded in each RAID controller. For example, use the **LSI MegaRAID Software Configuration Utility** or the **Intel® Rapid Storage Technology** if you installed Serial ATA hard disk drives on the Serial ATA connectors supported by the Intel® C612 chipset.

Refer to the succeeding section for details on how to use the RAID configuration utility.

## 5.2 LSI Software RAID Configuration Utility (RenderCube Rack only)

The LSI MegaRAID software RAID configuration utility allows you to create RAID 0, RAID 1, or RAID 10 set(s) from SATA hard disk drives connected to the SATA connectors supported by the motherboard southbridge chip.

To enter the LSI MegaRAID software RAID configuration utility:

- 1. Turn on the system after installing all the SATA hard disk drives.
- During POST, the LSI MegaRAID software RAID configuration utility automatically detects the installed SATA hard disk drives and displays any existing RAID set(s). Press <Ctrl> + <M> to enter the utility.

LSI MegaRAID Software RAID	BIOS Version A.10	09231523R
LSI SATA RAID Found at PCI	Bus No:00 Dev No:1	3
Device present at Port 0	ST3160812AS	152114MB
Device present at Port 1	ST3160812AS	152114MB
Device present at Port 2	ST3160812AS	152114MB
Device present at Port 3	ST3160812AS	152114MB
Press Ctrl-M or Enter to ru	n LSI Software RAI	D Setup Utility.



- The LSI MegaRAID software RAID configuration utility automatically configures to RAID 1 when the SATA to RAID Mode is enabled.
- The RAID setup screens shown in this section are for reference only and may not exactly match the items on your screen due to the controller version difference.
- When you create RAID sets with the LSI MegaRAID software RAID configuration utility, the boot priority of the SATA optical drive has to be manually adjusted. Otherwise, the system will not boot from the connected SATA ODD.
- The utility main window appears. Use the arrow keys to select an option from the Management Menu and then press <Enter>. Refer to the Management Menu descriptions on the next page.

At the bottom of the screen is the legend box. The keys on the legend box allow you to navigate through the setup menu options or execute commands. The keys on the legend box vary according to the menu level.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R
Management Menu Configure Initialize Objects Rebuild Check Consistency
Configure VD(s)
Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option

Menu	Description
Configure	Allows you to create RAID 0, RAID 1 or RAID 10 set using the Easy Configuration or the New Configuration command. This menu also allows you to view, add, or clear RAID configurations or select the boot drive
Initialize	Allows you to initialize the virtual drives of a created RAID set
Objects	Allows you to initialize virtual drives or change the virtual drive parameters
Rebuild	Allows you to rebuild failed drives
Check Consistency	Allows you to check the data consistency of the virtual drives of a created RAID set $% \left( {\left[ {{{\rm{AID}}} \right]_{\rm{AID}}} \right)$

### 5.2.1 Creating a RAID set

The LSI Software RAID Configuration Utility allows you to create a RAID 0, RAID 1, or RAID 10 set using two types of configurations: **Easy** and **New**.

In Easy Configuration, the virtual drive parameters are set automatically.

In New Configuration, you manually set the virtual drive parameters.

#### **Using Easy Configuration**

To create a RAID set using the Easy Configuration option:

 From the Management Menu, select Configure > Easy Configuration, and then press <Enter>.



 The ARRAY SELECTION MENU displays the available drives connected to the SATA ports. Use the up/down arrow keys to select the drives you want to include in the RAID set, and then press <Space>. When selected, the drive indicator changes from READY to ONLIN A[X]-[Y], where X is the array number, and Y is the drive number.

	Easy Configu	ration - ARRAY S	ELECTION MENU -	_
Configure		PORT #		
Initializ		ONLIN A00-00		
Rebuild		ONLIN A00-01		
Check Con		PEADY		
	<b>_</b>	READI		
		READY		
			-	



- The information of the selected hard disk drive displays at the bottom of the screen.
- You need at least two identical hard disk drives when creating a RAID 1 set.
- You need at least four identical hard disk drives when creating a RAID 10 set.
- Select all the drives required for the RAID set, and then press <F10> to configure array setting.
- 4. Press <Space> to select the configurable array.

LSI Sc Managem Configure Initializ Objects Rabuild Check Con	Diftware RAID Coni BIOS V Easy Configu	Figuration U	tility Ver C 0.09231523R AY SELECTION gurable Array	.05 Sep 17,20	
Cursor Keys,	SPACE-(De)Select	F2-Chidinfo	F3-SlotInfo	F10-Configure	Esc-Quit

5. Press <F10> again, the virtual drive information appears including a **Virtual Drive** menu that allows you to change the virtual drive parameters.

			- Virtual Dr:	ive(s) Confi	gured ——	
-Manage	LD	RAID	Size	#Stripes	StripSz	Status
Configu Initial	0		148.580GB	2	64KB	ONLINE
Objects Rebuild						
Check C	L	- Virtual	Drive 0-			
	RA	ID = 1				
	Un Si	its= MB ze = 1521	.46MB			
	DW	C = OFF				
	Ac	cept				

- 6. Select RAID from the Virtual Drive sub-menu, and then press < Enter>.
- 7. Select the RAID level from the menu, and then press <Enter>.

			- Virtual Dr:	ive(s) Confi	igured ———	
Manage	LD	RAID	Size	#Stripes	StripSz	Status
onfigu nitial	0		148.580GB	2	64KB	ONLINE
bjects ebuild						
heck C		-Virtual	Drive 0 —	RAID I	Level — —	
	RA	ID = 1 its= MB		RAID 0 RAID 1		
		70 - 1521	46MB			
	51		-			
	Di RA	C = OFF = On				
	DW RA Ac	IC = OFF = On cept				

- 8. Select Units from the Virtual Drive sub-menu, and then press <Enter>.
- 9. Select the units for virtual drive size from the menu, and then press <Enter>.



 When creating a RAID 1 or a RAID 10 set, select DWC from the Virtual Drive menu, and then press <Enter>.

When creating a RAID 0 set, proceed to step 12.

11. Select On to enable the Disk Write Cache setting, and then press < Enter>.





Enabling DWC can improve the performance, but with the risk of data loss.

12. When finished setting the selected virtual drive configuration, select **Accept** from the menu, and then press <Enter>.

			- Virtual Dr:	ive(s) Confi	.gured ——	
Manage	LD	RAID	Size	#Stripes	StripSz	Status
Configu Initial Objects Rebuild	0		148.580GB	2	64KB	ONLINE
	R U S D R A S	- Virtual AID = 1 nits= MB ize = 1521 WC = OFF A = On ccept PAN = NO	Drive 0			
		Accept Th	is VD Config	uration And	d Go To Next	VD

- 13. Follow step 2 to 12 to configure additional virtual drives.
- 14. Press <Esc> to finish RAID configuration. When prompted to save configuration, select **Yes** from the menu, and then press <Enter>.

-Manac Config Initia Object	gement ure lize s	Menu - M	Configurati Asy Configura New Configura View/Add Conf Clear Configu Select Boot E	on Menu - ation figuration uration Drive	Save ( Yes No	Configuration? -	
Rebui: Check	TD	PATD	- Virtual Dr:	ive(s) Confi #Strings	gured	Status	
		KALD	3126	#Stripes	SULPSZ	Status	
	0		148.580GB	2	64KB	ONLINE	
Select Yes Or No							

#### **Using New Configuration**



When a RAID set already exists, using the **New Configuration** command erases the existing RAID configuration data. If you do not want to delete the existing RAID set, use the **View/Add Configuration** command to view or create another RAID configuration.

To create a RAID set using the New Configuration option

 From the Management Menu, select Configure > New Configuration, and then press <Enter>.

LSI Softwa	re RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R
Management Me Gonfigure Initialize Objects Rebuild Check Consistence	- Configuration Menu - Facy Configuration View/Add Configuration Clear Configuration Salect Boot Drive Py ting Configuration And Start A New Configuration
Use Cursor Keys To	Navigate Between Items And Press Enter To Select An Option

- 2. Follow step 2 to 9 of the previous section: Using Easy Configuration.
- 3. Select Size from the Virtual Drive menu, and then press < Enter>.
- 4. Key-in the desired virtual drive size, and then press < Enter>.



5. Follow step 10 to 14 of the previous section: Using Easy Configuration to create the RAID set.

## 5.2.2 Adding or viewing a RAID configuration

You can add a new RAID configuration or view an existing configuration using the **View/Add Configuration** command.

#### Adding a new RAID configuration

To add a new RAID configuration:

 From the Management Menu, select Configure > View/Add Configuration, and then press <Enter>.

LSI Softw	are RAID Configuration Utility Ver C.05 Sep 17,2010
	BIOS Version A.10.09231523R
Management Me Configure Initialize Objects Rabuild Check Consisten	Configuration Menu Easy Configuration New Configuration Clear Configuration Select Boot Drive cy View/Add to The Existing Configuration
Use Cursor Keys 1	To Navigate Between Items And Press Enter To Select An Option

 The ARRAY SELECTION MENU displays the available drives connected to the SATA ports. Select the drive(s) you want to include in the RAID set, then press <Space>. When selected, the drive indicator changes from READY to ONLIN A[X]-[Y], where X is the array number, and Y is the drive number.

LSI S Manager Configur Initiali Objects Rebuild Check Co	Offware RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R View/Add Configuration - ARRAY SELECTION MENU 0 ONLIN A00-00 1 ONLIN A00-01 2 READY
Check Co	2     READY       3     READY
SPACE-Sel,EN	Port # 2 DISK         77247MB         HDS72808PLA380         PF20A60A           TER-EndArray,F10-Configure,F2-Drive         Info,F3-Virtual         Drives,F4-HSP



The information of the selected hard disk drive displays at the bottom of the screen.

3. Follow step 3 to 12 of section 6.2.1 Creating a RAID set: Using Easy Configuration to add a new RAID set.

## 5.2.3 Initializing the virtual drives

After creating the RAID set(s), you must initialize the virtual drives. You may initialize the virtual drives of a RAID set(s) using the **Initialize** or **Objects** command on the **Management Menu**.

#### Using the Initialize command

To initialize the virtual drive using the Initialize command

1. From the Management Menu, select Initialize, and then press <Enter>.

			BIUS VEIS.	ION A.J	.0.092515	ZSR	
Man	agement 1	lenu-					
Confi	gure						
Initi	alize						
Objec	ts						
Rebui	.1d						
Check	Consist	ency					
			101	cialize	VD(S)		

2. The screen displays the available RAID set(s) and prompts you to select the virtual drive to initialize. Use the arrow keys to select the virtual drive from the **Virtual Drive** selection, and then press <Space>.

LSI Software	RAID BI	Configura OS Versio	ation Utilit on A.10.092	ty Ver C.05 231523R	Sep 17,2010	
			- Virtual Dr	ive(s) Confi	.gured ———	
	LD	RAID	Size	#Stripes	StripSz	Status
Configure Initialize	0		148.580GB	2	64KB	ONLINE
Objects Rebuild Check Consistency						
Virtual Driv			t VD			
	SPA	CE-(De)Se	lect. F10-In	itialize		
		(				

3. Press <F10> to start initialization. When prompted, select **Yes** from the **Initialize?** dialog box, and then press <Enter>.

	RAID BI	Configura COS Versia	ation Utili on A.10.09	t <del>y Ver</del> C.05 231523R	Sep 17,2010	,		
			- Virtual Dr	ive(s) Confi	.gured ——			
	LD	RAID	Size	#Stripes	StripSz	Status		
Configure	•		140 50000	2	C ATTD			
Initialize	U		140.360GB	2	04AB	ONLINE		
Objects								
Rebuild			- 1ml	cialize?				
			No					
Virtual Drive 0								
	Init Will Destroy Data On Selected VD(s)							
Init W	ill De	stroy Dat	a On Select	ed VD(s)				



Initializing a virtual drive erases all data on the drive.

4. A progress bar appears on screen. If desired, press <Esc> to abort initialization. When initialization is completed, press <Esc>.

LSI Software RAID Configuration U BIOS Version A.1	tility Ver C.05 Sep 17,2010 0.09231523R
Management Menu Configure Initialize Objects Rabuild Check Consisten Virtual Drives Virtual Drives	al Drive(s) Configured fStripes StripSz Status s In Process ONLINE complete. Press Esc mpleted
SPACE-(De)Select, F	10-Initialize

#### Using the Objects command

To initialize the virtual drives using the **Objects** command

1. From the Management Menu, select Objects > Virtual Drive, and then press <Enter>.

LSI Software KAID Configuration Utility Ver C.05 Sep 17,2010
BIOS VERSION A.10.09231523R
Management Configure Initialize Discots Mebulid Check Consistency
Change VD Parameters
Change VD Faculto CCTD
Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option

2. Select the virtual drive to initialize from the Virtual Drives sub-menu, and then press <Enter>.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R					
Management Configure Initialize Physical Drive Physical Drive Rebuild Check Consistency					
Press ENTER To Select A VD, <del> To Delete A VD</del>					

3. Select Initialize from the pop-up menu, and then press <Enter> to start initialization.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010
BIOS Version A.10.09231523R
Management Configure Initialize Rebuild Check Consistency Useval Drive () Check Consistency Virtual Drive () Check Consistency Vietual Drive () Check Consistency
Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option

4. When prompted, press the <Space> to select **Yes** from the **Initialize?** dialog box, and then press <Enter>.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010
BIOS Version A.10.092315238 Management Adapter Virtual Drive (1) Virtual Drive 0 Virtual Drive 0 Virtual Drive (0) Initialize Check Consistency View/Opdate Parame No Init Will Destroy Data On Selected VD(s)
Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option

5. A progress bar appears on screen. If desired, press <Esc> to abort initialization. When initialization is completed, press <Esc>.

## 5.2.4 Rebuilding failed drives

You can manually rebuild failed hard disk drives using the **Rebuild** command in the **Management Menu**.

To rebuild a failed hard disk drive

1. From the Management Menu, select Rebuild, and then press <Enter>.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R
-Management Menu-
Initialize
Objects Rebuild
Check Consistency
Rebuild VD(s)
Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option

2. The **PHYSICAL DRIVES SELECTION MENU** displays the available drives connected to the SATA ports. Select the drive you want to rebuild, and then press <Space>.



3. After selecting the drive to rebuild, press <F10>. When prompted, press <Y> to rebuild the drive.



4. When rebuild is complete, press any key to continue.

## 5.2.5 Checking the drives for data consistency

You can check and verify the accuracy of data redundancy in the selected virtual drive. The utility can automatically detect and/or detect and correct any differences in data redundancy depending on the selected option in the **Objects > Adapter** menu.



The **Check Consistency** command is available only for virtual drives included in a RAID 1 or RAID 10 set.

#### Using the Check Consistency Command

To check data consistency using the Check Consistency command

1. From the Management Menu, select Check Consistency, and then press <Enter>.



 The screen displays the available RAID set(s) and prompts you to select the virtual drive to check. Press <Space> to select the virtual drive from the Virtual Drive submenu, and then press <F10>.

LSI Software	RAID C BIO	onfigura S Version	tion Utilit n A.10.092	ty Ver C.05 231523R	Sep 17,2010	)
			Virtual Dr.	ive(s) Confi	gured ———	
	LD	RAID	Size	#Stripes	StripSz	Status
Configure Initialize	0		148.580GB	2	64KB	ONLINE
Objects Bebuild						
Check Consistency						
Virtual Drive	es 0	Select	VD			
	SPACE	E-(De)Sel	ect, F10-In	itialize		

3. When prompted, use the arrow keys to select **Yes** from the **Consistency Check?** dialog box, and then press <Enter>.

LSI Software	RAID BI	Configur OS Versi	ation Utili on A.10.09	ty Ver C.05 231523R	Sep 17,201	0
Virtual Drive(s) Configured						
Management Menu Configure	LD 0	RAID 10	<mark>Size</mark> 154494MB	#Stripes 2	<mark>StripSz</mark> 64KB	Status ONLINE
Initialize Objects Rebuild		Co	nsistency (	Check?		
Virtual Drive		No	_			
		Select	VD(s)			
	SPA	CE- (De) Se	lect, F10-In	nitialize		

A progress bar appears on screen.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R								
Management Menu Configure Initialize Objects Rebuild <u>Check Consistency</u>	Virtual Drive(s) Configured LD RAID Size #Stripss StripSz CC Under Process VD 0 Consistency Check. Press Esc to Abort. 	Status ONLINE						
Virtual Drive Virtual Drive The Data	O O On The Drives Is Inconsistency. Repair Done!							
	SPACE-(De)Select, F10-Initialize							

- 4. While checking the disk consistency, press <Esc> to display the following options.
  - Stop

     Stops the consistency check. The utility stores the percentage of disk checked, and when you restart checking, it continues from the last percentage completed rather than from zero percent.
  - Continue Continues the consistency check.
  - Abort Aborts the consistency check. When you restart checking, it continues from zero percent.
- 5. When checking is complete, press any key to continue.

#### Using the Objects command

To check data consistency using the Objects command

- 1. From the **Management Menu**, select **Objects**, and then select **Virtual Drive** from the sub-menu.
- 2. Use the arrow keys to select the virtual drive you want to check, and then press <Enter>.
- 3. Select Check Consistency from the pop-up menu, and then press <Enter>.
- 4. When prompted, use the arrow keys to select **Yes** from the dialog box to check the drive.
- 5. When checking is complete, press any key to continue.

## 5.2.6 Deleting a RAID configuration

To delete a RAID configuration

1. From the Management Menu, select Configure > Clear Configuration, and then press <Enter>.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A 10,09231523B				
Management Me Configure Initialize Objects Rebuild Check Consisten	BIOS Version A.10.09231523R Configuration New Configuration View/Add Configuration Select Boot Drive cy cy			
Use Cursor Keys I	o Navigate Between Items And Press Enter To Select An Option			

2. When prompted, use the arrow keys to select **Yes** from the **Clear Configuration?** dialog box, and then press <Enter>.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R				
Management Me Easy Configuration Configure Dipicts Objects Rebuild Check Consistency Clear Existing Configuration				
Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option				

The utility clears all the current array(s).

3. Press any key to continue.

## 5.2.7 Selecting the boot drive from a RAID set

You must have created a new RAID configuration before you can select the boot drive from a RAID set. See section **6.2.1 Creating a RAID set: Using New Configuration** for details.

To select the boot drive from a RAID set

1. From the Management Menu, select Configure > Select Boot Drive, and then press <Enter>.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010					
		BIOS VEISION A.10.09251525K			
	Management Me Configure Initialize Objects Rebuild Cheok Consistend	Configuration Menu Easy Configuration New Configuration Clear Configuration Select Boot Drive Py			
	Use Cursor Keys T	Navigate Between Items And Press Enter To Select An Option			

 When prompted, use the arrow keys to select the bootable virtual drive from the list, then press <Enter>.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R				
Management Me Configure Initialize Objects Rebuild Check Consisten	Configur: Bootable VDs(1): Current Boot VD(0) Easy Configuration View/Add Configuration Clear Configuration Eelect Boot Drive ey			
Use Cursor Keys T	o Navigate Between Items And Press Enter To Select An Option			

3. The virtual drive is selected as boot drive. Press any key to continue.

## 5.2.8 Enabling WriteCache

You may manually enable the RAID controller's WriteCache option after creating a RAID set to improve the data transmission performance.



When you enable WriteCache, you may lose data when a power interruption occurs while transmitting or exchanging data among the drives.

The WriteCache function is recommended for RAID 1 and RAID 10 sets.

To enable WriteCache

1. From the **Management Menu**, select **Objects** > **Adapter**, select an existing adapter, and then press <Enter> to display the adapter properties.



- From the Management Menu, select Objects > Virtual Drive, select an existing adapter and press <Enter>. Select View/Update Parameters and press <Enter> to display the adapter properties.
- 4. Select **Disk WC**, and then press <Enter> to turn on the option.

LSI Software RAID Configuration Utility Ver C.05 Sep 17,2010 BIOS Version A.10.09231523R			
Management Configure Initialize Objects Rabuild Check Consistency	Virtual Drive RAID = 0 Size = 148.580GB Stripe Size = 64KB #Stripes = 2 State = 0PTIMAL Spans = 1 Disk WC = 0n Read Ahead = 0n Read Ahead = VD		
Use Cursor Keys To Navigate B	etween Items And Press Enter To Select An Option		

5. When finished, press any key to continue.

## 5.3 Intel<sup>®</sup> Rapid Storage Technology enterprise SATA/SSATA Option ROM Utility

The Intel® Rapid Storage Technology enterprise SATA/SSATA Option ROM utility allows you to create RAID 0, RAID 1, RAID 10 (RAID 1+0), and RAID 5 set from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.



Before you proceed, ensure that you have installed the Serial ATA hard disk drives, have set the correct jumper settings of the motherboard, and have set the correct SATA mode in the BIOS setup. You can refer to the **Installing hard disk drives, Setting Jumpers**, and **Setting the RAID mode sections in BIOS** for more information.

To launch the Intel® Rapid Storage Technology enterprise SATA/SSATA Option ROM utility:

- 1. Turn on the system.
- 2. During POST, press <Ctrl>+<l> to display the utility main menu.

Intel(R) Rapid Storag Copyright(C) 2	e Technology enterp 2003-12 Intel Corpora	rise - SATA ation. All	Option ROM - 3.6.0.1023 Rights Reserved.	
[MAIN MENU ]         1. Create RAID Volume         2. Delste RAID Volume         4. Exit				
[ DISK/VOLUME INFORMATION] RAID Volumes: None defined. Physical Disks: ID Drive Model Serial # Size Type/Status(Vol ID) 0 sr3300656SS 37WN00009846RaJ1 279.3GB Non-RAID Disk 1 sr3300656SS 37W00009846RaJ1 279.3GB Non-RAID Disk 2 sr3300656SS 397600009846UEDY 278.3GB Non-RAID Disk 3 sr3300656SS GWC50000991756G6 279.3GB Non-RAID Disk				
[ <b>†</b> ↓]-Select	[ESC]-Exit	[E	NTER]-Select Menu	

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.



The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

## 5.3.1 Creating a RAID set

To create a RAID set:

- 1. From the utility main menu, select 1. Create RAID Volume and press < Enter>.
- 2. Key in a name for the RAID set and press <Enter>.



- Press the up/down arrow keys to select a RAID Level that you wish to create then press <Enter>.
- From the **Disks** item field, press <Enter> to select the hard disk drives that you want to include in the RAID set.

[ SELECT DISKS ]					
Port	Drive Model	Serial #	Size	Status	
0	ST3300656SS	HWAS0000991753TR	279.3GB	Non-RAID Disk	
1	ST3300656SS	37vn00009846raj1	279.3GB	Non-RAID Disk	
2	ST3300656SS	397600009846UEDY	279.3GB	Non-RAID Disk	
3	ST3300656SS	GWC50000991756G6	279.3GB	Non-RAID Disk	
Select 1 Master and 1 Recovery disk to create volume.					

 Use the up/down arrow keys to move the selection bar then press <Space> to select a disk. A small triangle before the Port number marks the selected drive. Press <Enter> when you are done.  Use the up/down arrow keys to select the stripe size for the RAID array (for RAID 0, 10 and 5 only) then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The following are typical values: RAID 0: 128KB RAID 10: 64KB RAID 5: 64KB



We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

- 7. In the **Capacity** field item, key in the RAID volume capacity that you want to use and press <Enter>. The default value field indicates the maximum allowed capacity.
- 8. Press <Enter> to start creating the RAID volume.
- 9. From the following warning message, press <Y> to create the RAID volume and return to the main menu, or press <N> to go back to the **CREATE VOLUME** menu.



## 5.3.2 Deleting a RAID set



Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

- 1. From the utility main menu, select 2. Delete RAID Volume and press <Enter>.
- From the Delete Volume Menu, press the up/down arrow keys to select the RAID set you want to delete then press <Del>.

	1				
In	tel(R) Rapid Storage Copyright(C) 20	Technology ente 03-12 Intel Corp	erprise - SATA poration. All	A Option ROM L Rights Rese	- 3.6.0.1023 rved.
		[ DELETE VO	lume menu ] —		]
	Name Level Volume0 RAID0(Str:	Drives	Capacity 298.0GB	Status Normal	Bootable Yes
		1.17			
		[ HE	LP ]		
	Deleting a	volume will re	set the disks	to non-RAID	
	WARNING: ALL DISK DATA WILL BE DELETED. (This does not apply to Becovery volumes)				
	[^]]-Select	[ESC]-Previou	s Menu	[DEL]-Del	ete Volume

 Press <Y> to confirm deletion of the selected RAID set and return to the utility main menu, or press <N> to return to the DELETE VOLUME menu.



## 5.3.3 Resetting disks to Non-RAID



Take caution before you reset a RAID volume hard disk drive to non-RAID. Resetting a RAID volume hard disk drive deletes all internal RAID structure on the drive.

To reset a RAID set:

- 1. From the utility main menu, select 3. Reset Disks to Non-RAID and press < Enter>.
- Press the up/down arrow keys to select the drive(s) or disks of the RAID set you want to reset, then press <Space>. A small triangle before the Port number marks the selected drive. Press <Enter> when you are done.



 Press <Y> in the confirmation window to reset the drive(s) or press <N> to return to the utility main menu.

# 5.3.4 Exiting the Intel<sup>®</sup> Rapid Storage Technology enterprise SATA/SSATA Option ROM utility

To exit the utility:

- 1. From the utility main menu, select 4. Exit then press <Enter>.
- 2. Press <Y> to exit or press <N> to return to the utility main menu.



## 5.3.5 Rebuilding the RAID



This option is only for the RAID 1 set.

#### Rebuilding the RAID with other non-RAID disk

If any of the SATA hard disk drives included in the RAID 1 array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You can rebuild the RAID array with other installed non-RAID disks.

To rebuild the RAID with other non-RAID disk:

- 1. During POST, press <Ctrl>+<l> at the prompt to enter the Intel Rapid Storage Technology option ROM utility.
- If there is a non-RAID SATA Hard Disk available, the utility will prompt you to rebuild the RAID. Press the up/down arrow keys to select the destination disk then Press <Enter> to start the rebuilding process, or press <ESC> to exit.

[ DEGRADED VOLUM	E DETECTED ]			
"Degraded" volume and disk available for rebuilding detected. Selectign a disk initiates a rebuild. Rebuild completes in the operating system.				
Select the port of destination dis	k for rebuilding (ESC to exit):			
Port Drive Model Serial # X XXXXXXXXX XXXXXXXX	Size XXX.GB			
[^]-Previous/Next [ENTE	R]-Select [ESC]-Exit			



Select a destination disk with the same size as the original hard disk.

 The utility immediately starts rebuilding after the disk is selected. When done, the status of the degraded RAID volume is changed to "Rebuild".

Intel(R) Rapid Storage T Copyright(C) 2003	Technology enterprise - SAT 3-12 Intel Corporation. Al	A Option ROM - 3.6.0.1023 l Rights Reserved.
1. Create RAID 7 2. Delete RAID 7	[ MAIN MENU ] Volume 3. Reset 1 Volume 4. Exit	Disks to Non-RAID
	= [ DISK/VOLUME INFORMATION]	·
RAID Volumes: ID Name Level1 1 Volume0 RAID1(N	Strip Siz Mirror) N/A 149.00	*=Data is Encrypted e Status Bootable B <mark>Rebuild</mark> Yes
Physical Devices: Port Drive Model Se 1 ST3160812AS 9 2 ST3160812AS 3:	erial # Size LSOF4HL 149.0GB LSOJYL8 149.0GB	Type/Status(Vol ID) Member Disk(0) Member Disk(0)
Volumes with "Rebuild" :	status will be rebuilt with	in the operating system.
[ <sup>†</sup> ↓]-Select	[ESC]-Exit	[ENTER]-Select Menu

- 4. Press < Esc> to exit Intel Rapid Storage Technology and reboot the system.
- Select Start > Programs > Intel Rapid Storage > Intel Rapid Storage Console or click the Intel Rapid Storage Technology tray icon to load the Intel Rapid Storage Manager utility.
- From the View menu, select Advanced Mode to display the details of the Intel Rapid Storage Console.
- 7. From the **Volumes view** option, select **RAID volume** to view the rebuilding status. When finished, the status is changed to "**Normal**".

#### Rebuilding the RAID with a new hard disk

If any of the SATA hard disk drives included in the RAID array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You may replace the disk drive and rebuild the RAID array.

To rebuild the RAID with a new hard disk:

1. Remove the failed SATA hard disk and install a new SATA hard disk of the same specification into the same SATA Port.



Select a destination disk with the same size as the original hard disk.

2. Reboot the system then follow the steps in section **Rebuilding the RAID with other non-RAID disk**.

## 5.3.6 Setting the Boot array in the BIOS Setup Utility

You can set the boot priority sequence in the BIOS for your RAID arrays when creating multi-RAID using the Intel<sup>®</sup> Rapid Storage Technology enterprise SATA Option ROM utililty.

To set the boot array in the BIOS:



Set at least one of the arrays bootable to boot from the hard disk.

- 1. Reboot the system and press <Del> to enter the BIOS setup utility during POST.
- 2. Go to the **Boot** menu and select the boot option priority.
- Use up/down arrow keys to select the boot priority and press <Enter>. See the Boot menu section of Chapter 4 for more details.
- 4. From the Exit menu, select Save Changes & Exit, then press < Enter>.
- 5. When the confirmation window appears, select Yes, then press <Enter>.