RAID Support



4.1 RAID configurations

The motherboard supports Intel[®] Rapid Storage Technology with RAID 0, RAID 1, RAID 10, and RAID 5 solution.



If you want to install a Windows[®] operating system to a hard disk drive included in a RAID set, you have to create a RAID driver disk and load the RAID driver during OS installation. Refer to section **4.2 Creating a RAID driver disk** for details.

4.1.1 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 5 strips 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.

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.

4.1.2 Installing Serial ATA hard disks

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

To install the SATA hard disks for a RAID configuration:

- 1. Install the SATA hard disks into the drive bays.
- 2. Connect the SATA signal cables.
- 3. Connect a SATA power cable to the power connector on each drive.

4.1.3 Intel[®] Rapid Storage Technology in UEFI BIOS

To enter the Intel® Rapid Storage Technology in UEFI BIOS:

- 1. Enter the BIOS Setup during POST.
- 2. Go to the Advanced menu > PCH Storage Configuration, then press <Enter>.
- 3. Set the SATA Controller Mode Selection item to [RAID Mode].
- 4. Go to the **Boot** menu > **CSM** (Compatibility Support Module) > Launch CSM, then set the item to [Disabled].
- 5. Save your changes and exit the BIOS Setup, then enter the BIOS Setup again.
- Go to the Advanced menu > Intel(R) Rapid Storage Technology, then press <Enterto display the Intel[®] Rapid Storage Technology menu.



Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.

Due to chipset limitation, when SATA ports are set to RAID mode, all SATA ports run at RAID mode together.



Creating a RAID set

To create a RAID set:

1. From the Intel[®] Rapid Storage Technology menu, select **Create RAID Volume** and press <Enter>. The following screen appears:

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My Fav	orites Main	Ai Tweaker	Advanced	Monitor	Boot	Tool	Exit		🔄 Hardwa	are Monitor
← Advance	d\Intel(R) Rapid Stor	age Technology\Cre	ate RAID Volume							
Create I	AID Volume								Frequency 3000 MHz	Temperature 69°C
Name:					Volume1				BCLK 100.0 MHz	Core Voltage 0.888 V
RAID Le	vel:				RAID0(Strip	pe)		•	Ratio 30x	
SATA 0.), ST3160812AS 3LS0	0JYL8, 149.0GB						•	Memory	
SATA 0.	I, ST3160812AS 9LS0	0BJ5H, 149.0GB						•	Frequency 2133 MHz	Vol_CHAB 1.200 V
									Capacity	Vol_CHCD
Strip Siz	e:				16KB			•	4090 MB	1.203 V
Capacity	(MB):				0				Voltage	
									+12V	+SV

- 2. When the Name item is selected, enter a name for the RAID set and press <Enter>.
- 3. When the RAID Level item is selected, press <Enter> to select the RAID level to create, and then press <Enter>.
- 4. Under Select Disks, press <Enter> and select **X** for the disks you want to include in the RAID set.

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My Favorites Main Ai Tweaker <u>Advanced</u> Monitor Boot Tool Exit	🚰 Hardware Monitor
← Advanced\Intel(R) Rapid Storage Technology\Create RAID Volume	CPU
Create RAID Volume	Frequency Temperature 3000 MHz 69°C
Name: Volume1	BCLK Core Voltage 100.0 MHz 0.888 V
RAID Level: RAID0(Stripe) +	Ratio 30x
Select Disks:	
SATA 0.0, ST3160812AS 3LS0JYL8, 149.0GB	Memory
SATA 0.1, ST3160812AS 9LS0BJ5H, 149.0GB	Frequency Vol_CHAB 2133 MHz 1.203 V
	Capacity Vol_CHCD
Strip Size: 16KB 👻	4096 MB 1.193 V
Capacity (MB):	Voltage

- 5. When the Strip Size item is selected, press <Enter> to select strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:
 - RAID 0: 128 KB
 - RAID 10: 64 KB
 - RAID 5: 64 KB

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

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	OS Utility	– Advanced M	ode						
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My Favorites	Main	Ai Tweaker	Advanced	Monitor	Boot	Tool E	xit	🔄 Hardwa	are Monitor
Name:					Volume1			Frequency 3000 MHz	Temperature 71°C
RAID Level:					RAID0(Strip	pe)	-	BCLK 100.0 MHz	Core Voltage 0.883 V
Select Disks:					4KB				
SATA 0.0, ST31608	12AS 3LSOJ	'L8, 149.0GB			8KB			30x	
SATA 0.1, ST31608	12AS 9LSOB	J5H, 149.0GB			32KB 64KB 128KB			Memory Frequency 2133 MHz	Vol_CHAB
Strip Size:					16KB				
Capacity (MB):					305251			4096 MB	1.200 V
≻ Create Volume								Voltage	

- When the Capacity (MB) item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.
- When the Create Volume item is selected, press <Enter> to create the RAID volume and return to the Intel[®] Rapid Storage Technology menu.

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My Favorites	Main A	i Tweaker	Advanced	Monitor	Boot	Tool E	xit	🔄 Hardwa	are Monitor
Name:					Volume1			Frequency 3000 MHz	Temperature 70°C
RAID Level:					RAID0(Strip	pe)	-	BCLK 100.0 MHz	Core Voltage 0.883 V
								Ratio 30x	
SATA 0.0, ST3160	312AS 3LSOJYL8	, 149.0GB			X		~		
SATA 0.1, ST3160	312AS 9LSOBJ5	H, 149.0GB			x		•	Memory	
Strip Size:					16KB		-	2133 MHz	1.206 V
Capacity (MB):					305251			4096 MB	1.196 V
								Voltage	
➤ Create Volume									+61/
								11.904 V	4.840 V

Deleting a RAID set



Be cautious 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 Intel[®] Rapid Storage Technology menu, select the RAID volume you want to delete and press <Enter>. The following screen appears:



 When the Delete item is selected, press <Enter>, then select Yes to delete the RAID volume and return to the Intel[®] Rapid Storage Technology menu, or select No to cancel.



4.1.4 Intel[®] Rapid Storage Technology Option ROM utility

To enter the Intel® Rapid Storage Technology Option ROM utility:

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

Intel(R) Rapid Storage Technology - Option - v10.5.1.1070 Copyright(C) 2003-14 Intel Corporation. All Rights Reserved.							
[MAIN MENU] 1. Create RAID Volume 4. Recovery Volume Options 2. Delete RAID Volume 5. Acceleration Options 3. Reset Disks to Non-RAID 6. Exit							
RAID Volumes: None defined. Physical Devices: Port Device Model 0 sT3160812AS 1 sT3160812AS 2 sT3160812AS 3 sT3160812AS	DISK/VOLUME II Serial # 9LSOHJA4 9LSOF4HL 3LSOJYL8 9LSOBJ5H	Size 149.0GB 149.0GB 149.0GB 149.0GB 149.0GB	Type/Status(Vol ID) Non-RAID Disk Non-RAID Disk Non-RAID Disk Non-RAID Disk Non-RAID Disk				
[↑↓]-Select	[ESC]-Exit		[ENTER]-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.



The utility supports maximum four hard disk drives for RAID configuration.

Creating a RAID set

To create a RAID set:

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears:

Intel(R) Rapid Sto Copyright(C) 2003-1	orage Technology - Op 4 Intel Corporation.	
RAID Stri Ca	CREATE VOLUME ME Name: Volume 0 Level: Disks: p Size: pacity: Sync: Create volume	NU]
Enter a unique volume and is 16 characters	[HELP] name that has no or less.	special characters
[↑↓]-Select	[ESC]-Exit	[ENTER]-Select Menu

- 2. Enter a name for the RAID set and press <Enter>.
- 3. When the RAID Level item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.
- 4. When the Disks item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The SELECT DISKS screen appears:

149.0GB	New DATE Diele
	NON-RAID DISK
149.0GB	Non-RAID Disk
149.0GB	Non-RAID Disk
149.0GB	Non-RAID Disk
	149.0GB 149.0GB 149.0GB

- Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.
- 6. Use the up/down arrow key to select the strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:
 - RAID 0: 128 KB
 - RAID 10: 64 KB
 - RAID 5: 64 KB



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

- 7. When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.
- When the Create Volume item is selected, press <Enter>. The following warning message appears:



 Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the CREATE VOLUME menu.

Deleting a RAID set



Be cautious 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>. The following screen appears:

			LETE VO	LIME MENIII					
Name Volume0	Level RAIDO	(Stripe)	Drives 2	Capacity 298.0GB	Status Normal	Bootable Yes			
[HELP] Deleting a volume will reset the disks to non-RAID. WARNING: ALL DISK DATA WILL BE DELETED. (This does not apply to Recovery volumes)									

2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Delete>. The following warning message appears:



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

Exiting the Intel® Rapid Storage Technology Option ROM utility

To exit the utility:

1. From the utility main menu, select **6. Exit**, then press <Enter>. The following warning message appears:



2. Press <Y> to exit or press <N> to return to the utility main menu.

4.2 Creating a RAID driver disk

4.2.1 Creating a RAID driver disk in Windows®

To install the RAID driver for Windows® OS:

- 1. During the OS installation, click **Load Driver** to allow you to select the installation media containing the RAID driver.
- Insert the USB flash drive with RAID driver into the USB port or the support DVD into the optical drive, and then click **Browse**.
- Click the name of the device you've inserted, go to Drivers > RAID, and then select the RAID driver for the corresponding OS version. Click OK.
- 4. Follow the succeeding screen instructions to complete the installation.



Before loading the RAID driver from a USB flash drive, you have to use another computer to copy the RAID driver from the support DVD to the USB flash drive.



To set up a Windows® UEFI operating system under RAID mode, ensure to load the UEFI driver for your optical drive.