Configuring a RAID Set (X470 Series)

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RAID Levels

	RAID 0	RAID 1	RAID 10
Minimum Number of Hard Drives	≥2	2	4
Array Capacity	Number of hard drives * Size of the smallest drive	Size of the smallest drive	(Number of hard drives/2) * Size of the smallest drive
Fault Tolerance	No	Yes	Yes

To configure SATA hard drive(s), follow the steps below:

- A. Install hard drive(s) in your computer.
- B. Configure SATA controller mode in BIOS Setup.
- C. Configure a RAID array in RAID BIOS (Note 1)
- D. Install the SATA RAID/AHCI driver and operating system

Before you begin

- At least two SATA hard drives or M.2 SATA SSDs (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). (Note 2)
- A Windows setup disk.
- Motherboard driver disk.
- A USB thumb drive.

1-1 Configuring SATA Controllers

A. Installing SATA hard drive(s) in your computer

Install the hard drives/SSDs in the SATA/M.2 connectors on the motherboard. Then connect the power connectors from your power supply to the hard drives.

(Note 1) Skip this step if you do not want to create RAID array on the SATA controller.

(Note 2) Refer to "Internal Connectors," for the installation notices for the M.2, and SATA connectors.

B. Configuring SATA controller mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup. Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). Under Chipset, ensure Chipset SATA Port Enable is enabled. Set SATA Mode to RAID (Figure 1).



Figure 1

Step 2:

If you want to configure UEFI RAID, follow the steps in "C-1." To enter the legacy RAID ROM, save the settings and exit BIOS Setup. Refer to "C-2" for more information.



The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C-1. UEFI RAID Configuration

Only Windows 10 64-bit supports UEFI RAID configuration.

Step 1:

In BIOS Setup, go to BIOS and set CSM Support to Disabled (Figure 2). Save the changes and exit BIOS Setup.

	GIGABYTE	
M.I.T. System	BIOS Peripherals Chipset Power Save & ED	03/19/2018 08:13 Monday
Boot Option Priorities		
Boot Option #1	UEFI: USB FLASH DRIVE PM	AP, Partition 1
Bootup NumLock State	On	
Security Option Full Screen LOGO Show	System Enabled	
Fast Boot	Disabled	
CSM Support	Disabled	
Administrator Password		
User Password		
Secure Boot		
Alt Hala		
Alt Help		

Figure 2

Step 2:

After the system reboot, enter BIOS Setup again. Then enter the **Peripherals\RAIDXpert2 Configuration** Utility sub-menu (Figure 3).



Figure 3

Step 3:

On the RAIDXpert2 Configuration Utility screen, press <Enter> on Array Management to enter the Create Array screen. Then, select a RAID level (Figure 4). RAID levels supported include RAID 0, RAID 1, and RAID 10 (the selections available depend on the number of the hard drives being installed). Next, press <Enter> on Select Physical Disks to enter the Select Physical Disks screen.

			G	GABYTE			03/19/201	°08:17
M.L.T			Peripherals	Chipset	Power	Save & Exit	Monday	06.17
Select	RAID Level:			Volu	пе			
Select F	Physical Disks							
Configu Array S	ure Array Parameter	s:						
	ize: ize Unit:		Sele	ct RAID Level:	8			
David C	ache Policy:			Volume				
	ache Policy:			RAIDABLE				
				RAID 0				
Create	Array			RAID 1				
Esc	Back							
	Dack			-		_	-	

Figure 4

Step 4:

On the Select Physical Disks screen, select the hard drives to be included in the RAID array and set them to Enabled. Next, use the down arrow key to move to Apply Changes and press <Enter> (Figure 5). Then return to the previous screen and set the Array Size, Array Size Unit, Read Cache Policy and Write Cache Policy.



Figure 5

Step 5:

After setting the capacity, move to Create Array and press <Enter> to begin. (Figure 6)

	GIGABYTE	03/19/2018
	Peripherals Chipset Power Save & Exit	03/19/2018 08:19 Monday
Select RAID Level:	RAID 0	
Select Physical Disks		
Configure Array Parameters:		
Array Size:	2000	
Array Size Unit:	MB (MegaBytes)	
Read Cache Policy:	Read Ahead	
Write Cache Policy:	Write Back	
 Create Array 		
Esc Back		
Back		
	Figure 6	

Figure 6

After completing, you'll be brought back to the Array Management screen. Under Manage Array Properties you can see the new RAID volume and information on RAID level, array name, array capacity, etc. (Figure 7)

GIGABYTE						
		BIOS	eripherals	Chipset Power Sa	ve & Exit	03/19/2018 08:1 Monday
Select Arra	r.			Array 1, RAID0, 1.9 TB,	Normal	
Array Prope	erties:					
Array ID:						
RAID Level:				BAIDO		
Array Statu				Normal		
Array Capa				1.9 TB		
Array Polici	es:					
Read Cache				Read Ahead		
Write Cach				Write Back		
View Assoc	iated Physical D	Disks				
View Assoc	iated Physical D	Disks				
View Assoc	iated Physical D	Disks				
View Assoc	iated Physical D	Disks				
View Assoc	iated Physical D	Disks				
		Jiske,				
View Assoc		Jiske,				

Figure 7

Delete RAID Volume

To delete a RAID array, select the array to be deleted on the RAIDXpert2 Configuration Utility\Array Management\Delete Array screen. Press <Enter> on Delete Array to enter the Delete screen. Then set Confirm to Enabled and press <Enter> on Yes (Figure 8).



Figure 8

C-2. Configuring Legacy RAID ROM

Enter the legacy RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Steps:

In BIOS Setup, go to **BIOS** and set **CSM Support** to **Enabled**. Save the changes and exit BIOS Setup. After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-R> to Configure" (Figure 9). Press <Ctrl> + <R> to enter the RAID BIOS setup utility.



Figure 9

Creating a RAID Array

To create a new array, press <Enter> on the Create Array option. (Figure 10)

Creates an array from the connected disks Arrays	
	0-00, 79GB, Ready 1-01, 79GB, Ready
Initialize Disk(s) Create Array	
Delete Array(s) Swap Two Arrays Manage Hot Spare(s) View Disk Details	
View Array Details Rescan All Channels Controller Options	Available Keys
Continue to Boot License Level: 10	<↑><↓><←>>>=Choose, <esc>=Back <enter>=Select Menu Item</enter></esc>

Figure 10

The selection bar will move to the **Disks** section on the right of the screen. Select the hard drives to be included in the RAID array. Use the up or down arrow key to select a hard drive and press <Insert>. The selected hard drive will be shown in green. To use all of the hard drives, simply press <A> to select all. Then press <Enter> and the selection bar will move to the **User Input** section on the left bottom of the screen. (Figure 11)

Arrays —	Disks Disks
Disks: 0, 1 Type: RAID 0	
User Input Select Array Type to Create RAID5 RAID0 RAID1 Volume RAID10 RAID1 Volume RAID10	Available Keys Available Keys Choose, <esc>=Back <enter>=Select Menu Item</enter></esc>

Figure 11

First, select a RAID mode and press <Enter>. The selections available depend on the number of the hard drives being installed. Then follow the on-screen instructions to specify the array size. You can select **All available space** to use the maximum size allowed or use the up or down arrow key to adjust the size (Figure 12) and press <Enter>.

AMD-RAID Array Confi	guration (Build: 8.1.0-00046)
Arrays Disks: 0, 1 Type: RAID 0 Total Size: 1.9TB	Disks 0-02, 999GB, Ready 1-03, 999GB, Ready
User Input User Input	
Size Chosen: All available space DOS Size: 1.8TB Exactly: 1,999, 286, 304, 768	Available Keys <pageup><t><pagedown><4>=Change Size <enter>=Complete, <esc>=Go Back</esc></enter></pagedown></t></pageup>

Figure 12

AMD-RAID Array Read and Write-back Caching. (Some data may be lost i Arrays	Configuration (Build: 8.1.0-00046)
	0-02, 999GB, Ready 1-03, 999GB, Ready
Create Array Disks: 0, 1 Type: RAID 0 Total Size: 1.9TB	
Cachin Mode: Read/Write User Input	
Read/Write Read Only None	Available Keys — <↑><↓><←>>>=Choose, <esc>=Back <enter>=Select Menu Item</enter></esc>

Select a caching mode. Options include Read/Write, Read Only, and None. Then press <Enter> to proceed.

Figure 13

Finally, a message which says "Confirm Creation of Array" will appear. Press <C> to confirm or <Esc> to return to the previous screen.

When completed, you will see the new array on the main screen (Figure 14). To exit the RAID BIOS utility, press <Esc> and then press <C> to confirm.

AMD-RAID Array Config Creates an array from the connected disks Arrays 1RAID0, 1.9TB, Normal(R/W)	uration (Build: 8.1.0-00046) 0-02, 999GB, Online 1-03, 999GB, Online
Main Menu Initialize Disk(s) Create Array Delete Array(s) Swap Two Arrays Manage Hot Spare(s) View Disk Details View Array Details Rescan All Channels Controller Options Controller Options Controller Details License Level: 10	Available Keys <↑><↓><←>>→>=Choose, <esc>=Back <enter>=Select Menu Item</enter></esc>

Figure 14

Deleting an Array

The Delete Array(s) menu option allows for deletion of disk array assignments.

Deleting an existing disk array could result in loss of data. Record all array information including the array type, the disk members, and stripe block size in case you wish to undo a deletion.

- 1. Select Delete Array(s) in the Main Menu and press <Enter>.
- 2. In the Arrays section, press the <Insert> key on the array you want to delete and then press <Enter> to proceed.
- 3. When prompted to confirm (Figure 15), press <C> to continue the deletion or <Esc> to cancel.

AMD-RAID Array Configuration (Build: 8.1.0-00046)				
Arrays 1RAID0, 1.91B, Normal(R/W)	0-00, 79GB, Online 1-01, 79GB, Online			
All data on the selected array(s) Initialize Disk(s) Create Array Delete Array(s) Swap Two Arrays Memory Las Surge(c)	i be lost! tinue?			
Manage Hot Spare(s) View Wisk Details Rescan All Channels Controller Options Continue to Boot License Level: 10	Available Keys			

Figure 15

1-2 Installing the SATA RAID/AHCI Driver and Operating System

With the correct BIOS settings, you are ready to install the operating system.

A. Installing Windows

As some operating systems already include SATA RAID/AHCI driver, you do not need to install separate RAID/ AHCI driver during the Windows installation process. After the operating system is installed, we recommend that you install all required drivers from the motherboard driver disk using "Xpress Install" to ensure system performance and compatibility. If the operating system to be installed requires that you provide additional SATA RAID/AHCI driver during the OS installation process, please refer to the steps below:

Step 1:

Copy the Hw10 folder under the \BootDrv folder in the driver disk to your USB thumb drive.

Step 2:

Boot from the Windows setup disk and perform standard OS installation steps. When the screen requesting you to load the driver appears, select **Browse**.

Step 3:

Insert the USB thumb drive and then browse to the location of the driver. The location of the driver is as follows: Windows 64-bit: $Wu10\RAID\x64$

Step 4:

When a screen as shown in Figure 1 appears, select AMD-RAID Bottom Device first and click Next to load the driver. Then select AMD-RAID Controller and click Next to load the driver. Finally, continue the OS installation.

🕒 🕂 Install Windows	
Select the driver to be installed.	
AMD-RAID Bottom Device (C:Hw10/RAID/a64/rcbottom.inf) AMD-RAID Bottom Device (C:Hw10/RAID/a64/rcbottom.inf)	
AMD-RAID Controller [storport] (C:Hw10/RAID/a64/rebottom.inf)	
$\overline{\mathbf{V}}$ Hide drivers that are not compatible with hardware on this computer.	
Brgwse Bescan	Next
Figure 1	
Figure 1	

B. Rebuilding an Array

Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1 and RAID 10 arrays. To replace the old drive, make sure to use a new drive of equal or greater capacity. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array.

While in the operating system, make sure the Chipset and RAID drivers have been installed from the motherboard driver disk. Then double-click the **RAIDXpert2** icon on the desktop to launch the RAID utility.



Step 1:

Enter the login ID and password (default: "admin"), and then click **Submit** to launch **AMD RAIDXpert2**.



Step 3:

On the next screen, select **Assign as Global Spare** and click **Confirm**.



Step 5:

Then rebuild is complete when the **Task State** column shows "COMPLETED."





In the **Disk Devices** section, left-click your mouse twice on the newly-added hard drive.





During the rebuild process, you can select the array that is being built (displayed in red) in the **Active Volumes** section to check the current progress.