# **AMD RAID Installation Guide**

1. AMD BIOS RAID Installation Guide	2
1.1 Introduction to RAID	2
1.2 RAID Configurations Precautions	4
1.3 UEFI RAID Configuration	6
2. AMD Windows RAID Installation Guide	19
2.1 Create a RAID volume under Windows	19
2.2 Delete a RAID array under Windows.	26

## **1. AMD BIOS RAID Installation Guide**

The BIOS screenshots in this guide are for reference only and may differ from the exact settings for your motherboard. The actual setup options you will see shall depend on the motherboard you purchase. Please refer to the product specification page of the model you are using for information on RAID support. Because the motherboard specifications and the BIOS software might be updated, the content of this documentation will be subject to change without notice.

AMD BIOS RAID Installation Guide is an instruction for you to configure RAID functions by using the onboard FastBuild BIOS utility under BIOS environment. After you make a SATA driver diskette, press [F2] or [Del] to enter BIOS setup to set the option to RAID mode by following the detailed instruction of the "User Manual" in our support CD, then you can start to use the onboard RAID Option ROM Utility to configure RAID.

## **1.1 Introduction to RAID**

The term "RAID" stands for "Redundant Array of Independent Disks", which is a method combining two or more hard disk drives into one logical unit. For optimal performance, please install identical drives of the same model and capacity when creating a RAID set.

#### RAID 0 (Data Striping)

RAID 0 is called data striping that optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. It will improve data access and storage since it will double the data transfer rate of a single disk alone while the two hard disks perform the same work as a single drive but at a sustained data transfer rate.



Disk 0 Disk 1

#### WARNING!!

Although RAID 0 function can improve the access performance, it does not provide any fault tolerance. Hot-Plug any HDDs of the RAID 0 Disk will cause data damage or data loss.

#### RAID 1 (Data Mirroring)

RAID 1 is called data mirroring that copies and maintains an identical image of data from one drive to a second drive. It provides data protection and increases fault tolerance to the entire system since the disk array management software will direct all applications to the surviving drive as it contains a complete copy of the data in the other drive if one drive fails.3



#### **RAID 5 (Block Striping with Distributed Parity)**

RAID 5 stripes data and distributes parity information across the physical drives along with the data blocks. This organization increases performance by accessing multiple physical drives simultaneously for each operation, as well as fault tolerance by providing parity data. In the event of a physical drive failure, data can be re-calculated by the RAID system based on the remaining data and the parity information. RAID 5 makes efficient use of hard drives and is the most versatile RAID Level. It works well for file, database, application and web servers.



**RAID 10 (Stripe Mirroring)** RAID 0 drives can be mirrored using RAID 1 techniques, resulting in a RAID 10 solution for improved performance plus resiliency. The controller combines the performance of data striping (RAID 0) and the fault tolerance of disk mirroring (RAID 1). Data is striped across multiple drives and duplicated on another set of drives.4



## **1.2 RAID Configurations Precautions**

- Please use two new drives if you are creating a RAID 0 (striping) array for performance. It is
  recommended to use two SATA drives of the same size. If you use two drives of different sizes, the
  smaller capacity hard disk will be the base storage size for each drive. For example, if one hard disk has
  an 80GB storage capacity and the other hard disk has 60GB, the maximum storage capacity for the
  80GB-drive becomes 60GB, and the total storage capacity for this RAID 0 set is 120GB.
- 2. You may use two new drives, or use an existing drive and a new drive to create a RAID 1 (mirroring) array for data protection (the new drive must be of the same size or larger than the existing drive). If you use two drives of different sizes, the smaller capacity hard disk will be the base storage size. For example, if one hard disk has an 80GB storage capacity and the other hard disk has 60GB, the maximum storage capacity for the RAID 1 set is 60GB.
- 3. Please verify the status of your hard disks before you set up your new RAID array.

#### WARNING!!

Please backup your data first before you create RAID functions. In the process you create RAID, the system will ask if you want to "Clear Disk Data" or not. It is recommended to select "Yes", and then your future data building will operate under a clean environment.

## **1.3 UEFI RAID Configuration**

Setting up a RAID array using UEFI Setup Utility and installing Windows

### STEP 1: Set up UEFI and create a RAID array

- 1. While the system is booting, press [F2] or [Del] key to enter UEFI setup utility.
- 2. Go to Advanced\Storage Configuration.
- 3. Set "SATA Controller(s)" to <RAID>.



4. Go to Advanced\AMD PBS and set "NVMe RAID mode" to <Enabled >.



5. Go to Boot\CSM and set "CSM" to <Disabled>.



- 6. Press [F10] to save your changes and exit, and then enter the UEFI Setup again.
- 7. After saving the previously changed settings via [F10] and rebooting the system, the "RAIDXpert2 Configuration Utility" submenu becomes available.



8. Go to Advanced\RAIDXpert2 Configuration Utility\Array Management, and then delete the existing disk arrays before creating a new array.

Even if you have not configured any RAID array yet, you might have to use "Delete Array" first.



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🚺 Array 2, Non-RAID, 2.0	TB, Normal			Enabled	6 //	the second	10V
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9. Go to Advanced\RAIDXpert2 Configuration Utility\Array Management\Create Array



#### 9A. Select "RAID Level"

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Select RAID Level	1:			Volume		E GEN N	
					e 🖉 De	scription	
🔀 Select Physic	al Disks				and the second se	ts the desired RAID	
			Select R	AID Level: 🛛 🔀	Volun	ne, RAIDAble, RAID O	
Configure Array P	Parameters:		Volume		and F	AID 5 and RAID 10.	
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Array Size Unit:			RAID O			tenation of disks ( BLE RAID aware s	
			RAID 1 🖡		for f	uture redundancy.	
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						1 Uses disk mirr de an exact copy fo	
Read Cache Policy	y:			Read Cache		idancy.	uata
Write Cache Polic	cy:			Write Back Cache	RAID	5 uses striping w	with parity
		1.3.0			Get o	letails via OR code	
Create Array		1307					
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#### 9B. Select "Select Physical Disks".



9C. Change "Select Media Type" to "SSD" or leave at "BOTH".



9D. Select "Check All" or enable specific drives that you want to use in the array. Then select "Apply Changes".

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Advanced\RAI	)Xpert2 Configuratio	n Utility\Array Ma	nagement\Yes			- T	THE STATE
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	L:0, NVMe Gen3 x4, 2			Enabled	Des	scription	
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#### 9E. Select "Create Array".

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Advanced\RAIDXpert2 Configuration Utility\Array Management		1		10
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Select RAID Level:			East	
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👔 💥 Select Physical Disks		Creat	es the Array	
				N
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🖡 Array Size:	4095499			1
Array Size Unit:	MB (MegaBytes)			11/
×				- I W
Select CacheTagSize:	256KB			- 12
		Li		1.12
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📭 🗙 Create Array				
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10. Press [F10] to save to exit.

\*Please note that the UEFI screenshots shown in this installation guide are for reference only. Please refer to ASRock's website for details about each model. https://www.asrock.com/index.asp

### STEP 2: Download driver from ASRock's website

 Please download the "SATA Floppy Image" driver from ASRock's website (<u>https://www.asrock.com/index.asp</u>) and unzip the file to your USB flash drive.
 Normally you can also use the RAID driver offered via the AMD website.



## STEP 3: Windows installation

Insert the USB drive with Windows 10 installation files. Then restart the system. While the system is booting, please press [F11] to open the boot menu that is shown in this picture. It should list the USB drive as a UEFI device. Please select this to boot from. If the system restarts at this point, then please open the [F11] boot menu again.



 When the disk selection page shows up during the Windows installation process, please click <Load Driver>. Do not try to delete or create any partition at this point.

	Name	Total size	Free spa	Туре	
	Drive 0 Partition 1	1907.7 GB	0.0 MB	Primary	
0	Drive 1 Partition 1	1907.7 GB	0.0 MB	Primary	
ۥ Ref	resh XDele	e <u>E</u> ormat		N <u>e</u> w	

 Click <Browse> to find the driver on your USB flash drive. Three drivers must be loaded. This is the first. The folder names might look different depending on the driver package that you are using.

🕒 🔏 Windov	vs Setup	×
Selec	t the driver to install	
	Load driver	
	To install the device driver for your drive, insert the installation media containing the driver files, and then click OK.	
	Note: The installation media can be a CD, DVD, or USB flash drive.	
	Browse OK Cancel	
✓ Hide	e drivers that aren't compatible with this computer's hardware.	
Brov	wse <u>R</u> escan <u>N</u> ext	

Browse for Folder	
Browse to the driver, and then click OK.	
🗸 🥪 ESD-USB (C:)	^
> 📙 boot	
> 📙 efi	
Floppy(v18.1.2.1034_0111)	
Floppy(v9.2.0.120) (1)	
Floppy(v9.2.0.120)	
<b>W10x6</b>	
> 📕 sources 📈	
> 📜 support	
> _ WIN10	
> Soot (X:)	
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3. Select "AMD-RAID Bottom Device" and then click <Next>.

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4. Load the second driver.

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5	Floppy(v18.1.2.1034_0111)	
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	✓ Floppy(v9.2.0.120) W10x6	
>	sources M	
~	support WIN10	
> 🖕	Boot (X:)	

5. Select "AMD-RAID Controller" and then click <Next>.

	py(v9.2.0.120) (1)\Floppy(v9.2.0.120)\W1 py(v9.2.0.120) (1)\Floppy(v9.2.0.120)\W1	
11-11-11-11-11-11-11-11-11-11-11-11-11-	\Floppy(v9.2.0.120) (1)\Floppy(v9.2.0.120	
<		)

6. After the second driver is loaded, the RAID disk will show up. Please do not forget to load the third driver.

× 🗢	ESD-USB (C:)	~
>	boot	
>	📜 efi	
>	Floppy(v18.1.2.1034_0111)	
~	Floppy(v9.2.0.120) (1)	
	Floppy(v9.2.0.120)	
	📕 W10x64	
>	sources 1	
>	support	
>	WIN10	
	Boot (X:)	

7. Select "AMD-RAID Config Device" and then click <Next>.

AMD-RAID Bottom Device (C:\Floppy(v9.2.0.120) (1)\Floppy(v9.2.0.120)\W10x64\	rchottom i
AMD-RAID Bottom Device (C:\Floppy(v9.2.0.120) (1)\Floppy(v9.2.0.120)\W10x64	
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AMD-RAID Controller [storport] (C:\Floppy(v9.2.0.120) (1)\Floppy(v9.2.0.120)\W1	
<	>

8. Select unallocated space and then click <Next>.

Name		Total size Free s	ра Туре	
G Drive 0 Una	allocated Space	3814.2 GB 3814.2	2 GB	
Refresh	Delete	Eormat	<mark>,</mark> ∦N <u>e</u> w	

9. Please follow the Windows installation instructions to finish the process.



10. After the Windows installation is finished, please install the drivers from ASRock's website.

📅 Disk Management File Action View	Help						- 🗆 X	I际 Task Manager File Options View	- 0
Image: Column         Image: Column           Image: Column (Column)         (Disk 1 partition 1)           Image: Column (Column)         (Disk 1 partition 4)           Image: ESD-USB (Do:)         (Disk 1 partition 4)	Layout Simple Simple Simple Simple	Type Basic Basic Basic Basic	File System NTFS NTFS FAT32	Status Healthy (B Healthy (E Healthy (R Healthy (A	100 MB 499 MB	Free Spa 3787.71 100 MB 84 MB 24.21 GB		Processes Performance App hi CPU 3% 3.77 GHz Memory 3.2/15.9 GB (20%)	istory Startup Users Details Services Disk 1 (C:) AMD-RAID Array 1 SCSI Disk Device Active time 1009
								Disk 0 (D:) Removable 0% Disk 1 (C:) SD 1%	60 reconds Dirk transfer rate 100 MBA
	0 MB aaithy (EFI Syste		GB NTFS (Boot, Page File	, Crash Dump, B	asic Data Partitic		99 MB NTFS ealthy (Recovery Partiti	Ethernet Ethernet S: 0 R: 0 Kbps GPU 0 Radeon RX 590 Seri	60 seconds 60 seconds Active time. Average response time. Capacity: 3.7 TB
		Internet						0% (30 °C)	1%     0.9 ms     Formatted:     3.7.TB       1%     0.9 ms     System disk     Yes       Read speed     Write speed     Page file:     Yes       132 KB/s     6.8 MB/s     Type:     SSD

#### https://www.asrock.com/index.asp

11. Go to Boot menu and set "Boot Option #1" to <Windows Boot Manager (AMD-RAID)>.



## 2. AMD Windows RAID Installation Guide

### **Caution:**

This chapter describes how to configure a RAID volume under Windows. You can use for the following scenarios:

- 1. Windows is installed on a 2.5" or 3.5" SATA SSD or HDD. You want to configure a RAID volume with NVMe M.2 SSDs.
- Windows is installed on an NVMe M.2 SSD. You want to configure a RAID volume with 2.5" or 3.5" SATA SSDs or HDDs.

## 2.1 Create a RAID volume under Windows

1. Enter the UEFI Setup Utility by pressing <F2> or <Del> right after you power on the computer.

2. Set the "SATA Controller(s)" option to <RAID>. (If you are using NVMe SSDs for RAID configuration, please skip this step)



3. Go to Advanced\AMD PBS and set "NVMe RAID mode" to <Enabled >. (If you are using 2.5" or 3.5" SATA drives for RAID configuration, please skip this step)



4. Press "F10" to save the setting and reboot to Windows.

5. Install the "AMD RAID Installer" from the AMD website:

#### https://www.amd.com/en/support

Select "Chipsets", select your socket and chipset, and click "Submit". Please find "AMD RAID Installer".

AMD RAID Installer (SATA, I	NVMe RAID)		
Revision Number 2.09.28.009	File Size 143 MB	Release Date 2020年10月9日	下载*
+ Driver Details			

6. After installing the "AMD RAID Installer", please launch "RAIDXpert2" as administrator.

D	Open
	Open file location
•	Run as administrator
	Troubleshoot compatibility
	Pin to Start
	Scan with Windows Defender
ciescie	Pin to taskbar
	Restore previous versions
	Send to
	Cut
	Сору
	Create shortcut
	Delete
	Rename

7. Find "Array" in the menu and click on "Create".



8. Select the RAID type, the disks which would like to use for RAID, volume capacity and then create the RAID array.

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Volume (JBOD)	Disk Port Type Capacity Uses Free Space Largest Free GS Model Number Serial Number Firmware Version	
	Select       Array Options         All       Type:       Volume (JBOD)         All HDD       Organized As:       Image: Comparized As:         All SATA SSD       Max Capacity:       499548         All NVMe       Capacity:       499548         Unused       Cache Options:       Read + Write Back Cache         Unused       Cache Options:       Read + Write Back Cache         Cache Tag Size:       Default       Image: Cache Cache         Cache Cache       Image: Cache Cache       Image: Cache Cache         Cache Tag Size:       Default       Image: Cache Cache         Cache Tag Size:       Default       Image: Cache Cache         Cache Cache       Image: Cache Cache       Image: Cache Cache         Create       Image: Cache Cache       Image: Cache Cache         Create       Image: Cache Cache       Image: Cache Cache         Create       Image: Cache Cache Cache       Image: Cache	

9. In Windows open "Disk Management". You will be prompted to initialize the disk. Please select "GPT" and click "OK".

📅 Disk Managem	ient						-	×
File Action Vi								
	📅 🗩 🗙	: 🗹 🔓 💆 🖾	]					
Volume	Layout	Туре	File System	Status	Capacity	Free Spa	% Free	
(C:)	Simple	Basic	NTFS	Healthy (B	465.13 GB	430.78 GB	93 %	
<ul> <li>Disk 0 partition</li> <li>Recovery</li> </ul>	<ol> <li>Simple Simple</li> </ol>	Basic	NITEC	Healthy (E	100 MB	100 MB	100 % 18 %	
- Recovery	Simple	Initialize Disk				×	10 /6	
		You must initialize	a disk before Lor	nical Disk Manage	r can access it			
		Select disks:		noar biot manage				
		✓ Disk 1						
		Use the following	nartition style for t	he selected disks				
		MBR (Master			•			
- Disk 0		GPT (GUID P						^
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465.75 GB Online	529 MB NTF	Note: The GPT p Windows.	artition style is not	recognized by all	previous version:	11		
Omme	Healthy (OE						y Partiti	
					ок с	ancel		
Olisk 1 Unknown								
3814.23 GB	3814.23 GB							
Not Initialized	Unallocated							
Unallocated	Primary partit	ion						<b>`</b>

10. Right click at the "Unallocated" section of the disk and create a new simple volume.



11. Follow the "New Simple Volume Wizard" to create a new volume.

Completing the New Si Volume Wizard	imple
You have successfully completed the N Wizard. You selected the following settings:	lew Simple Volume
Volume type: Simple Volume Disk selected: Disk 1 Volume size: 3905754 MB Drive letter or path: D: File system: NTFS Allocation unit size: Default Volume label: New Volume Quick format: Yes	<b>^</b>
To close this wizard, click Finish.	

#### 12. Wait a bit for the system to create the volume.

File Action View Help							X
🗢 🏟   📰   🖉 🖬   🗯 🖓	35						
Volume     Layout       Image: C: Simple     Simple       Image: Disk 0 partition 2)     Simple       Image: Disk 1 partition 2)     Simple       Image: Recovery     Simple	Type Basic Basic Basic Basic	File System NTFS RAW NTFS	Status Healthy (B Healthy (E Formatting Healthy (	Capacity 465.13 GB 100 MB 3814.21 GB 529 MB	Free Spa 430.78 GB 100 MB 3814.21 94 MB	% Free 93 % 100 % 100 % 18 %	
<b>Disk 0</b> Basic 465.75 GB Online <b>Recovery</b> 529 MB NTFS Healthy (OEM		100 MB Healthy (EFI Syst	(C.) 465.13 GB NTFS Healthy (Boot,	) Page File, Crash	Dump, Primar	y Partiti	^
■ Disk 1     Basic     3814.21 GB     Online     Unallocated     Primary partitio	n						

13. After creating the volume the RAID is available to use.

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File Action Vi	ew Help							File Opti	ons View					
(+ +) 🖂 🖬		1						Processes	Performance App histor	/ Startup Users	Details Services			
Volume = (C:) = (Disk 0 partition 2) = New Volume (D:) = Recovery		Layout Type File System Status Simple Basic NTFS Health Simple Basic NTFS Health Simple Basic NTFS Health	Status Healthy (B., Healthy (E., Healthy (P., Healthy (.,	hy (B 465.13 GB 430.78 GB 93 % hy (E 100 MB 100 MB 100 % hy (P 3814.21 GB 3814.00 100 %			CPU 1% 3.85 GHz Memory 2.1/15.9 GB (12%) Disk 0 (C:) 0% 0(C:) 0% 0(C:) 0% 0(C:) 0% 1 (D:) 0% 1 (D:) 0% 1 (D:) 0% 1 (D:) 0% 1 (D:) 0% 1 (D:) 0% 1 (D:)			AMD-RAID Array 1 SCSI Di				
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Disk 1 Basic 3814.21 GB Online	New Volume (I 3814.21 GB NTFS Healthy (Primary			,						Active time 0% Read speed 0 KB/s	Average response time 0 ms Write speed 73.7 KB/s	Capacity: Formatted: System disk: Page files	3.7 TB 7.4 TB No No	
Unallocated	Primary partition							· Fewer	details 🛛 🛞 Open Resour	ce Monitor				

## 2.2 Delete a RAID array under Windows.

1. Select the array which you would like to delete.



2. Find "Array" in the menu and click on "Delete".



3. Click "Yes" to confirm.

