

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 Legacy RAID ROM Configuration (for AMD X470, B450, X370, B350, A320 and A300 Chipsets).....	5
1.4 UEFI RAID Configuration (for AMD X399, X470, B450, X370, B350, A320 and A300 Chipsets).....	11
2. AMD Windows RAID Installation Guide.....	16

1. AMD BIOS RAID Installation Guide

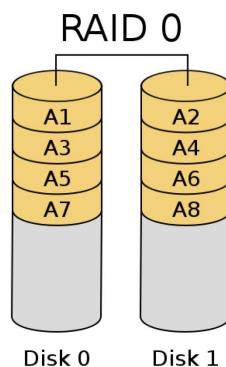
AMD BIOS RAID Installation Guide is an instruction for you to configure RAID functions by using the onboard FastBuild BIOS utility under BIOS environment. After you make a SATA driver diskette, press <F2> or to enter BIOS setup to set the option to RAID mode by following the detailed instruction of the "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.

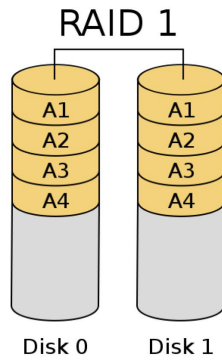


WARNING!!

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.

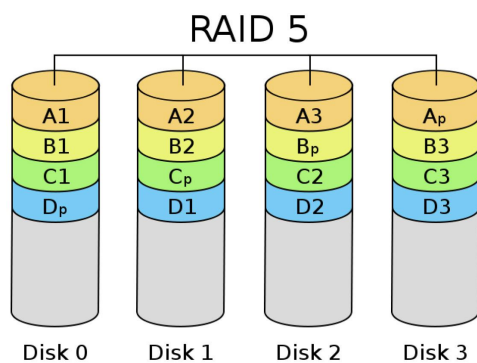
RAID 1 (Data Mirroring)

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.



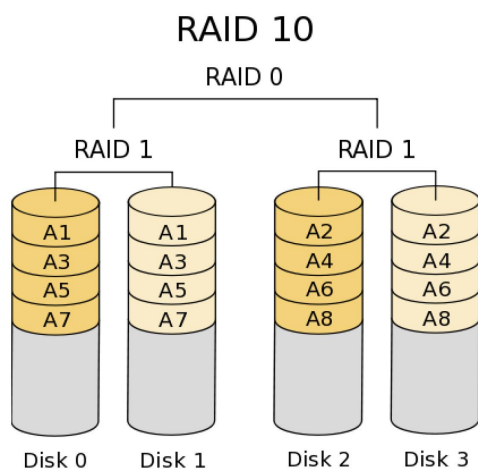
RAID 5 (Block Striping with Distributed Parity)

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.



1.2 RAID Configurations Precautions

1. 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 Legacy RAID ROM Configuration (for AMD X470, B450, X370, B350, A320 and A300 Chipsets)

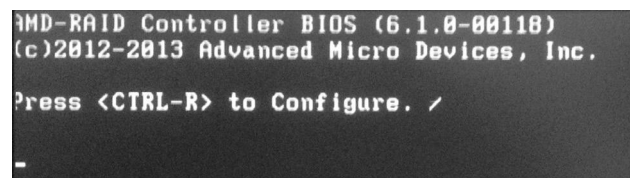
Use legacy RAID ROM to create and configure the RAID disk.

STEP 1: Set up UEFI

- A. During system boot, press <F2> or key to enter UEFI setup utility.
- B. Go to Advanced→ Storage Configuration.
- C. Set the “PT SATA Mode” option to <RAID>.
- D. Click <F10> to save to exit.

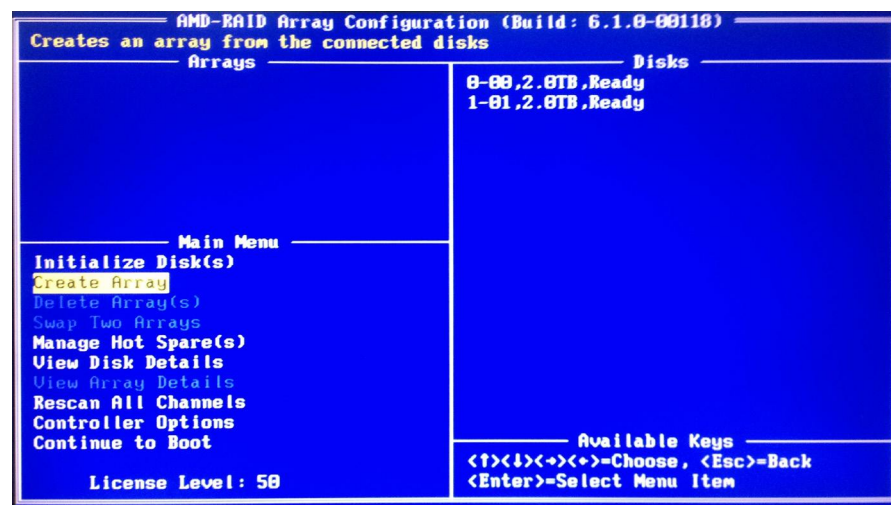
STEP 2: Create and configure the RAID disk

- A. During system boot, press <Ctrl+R> to enter legacy RAID ROM utility.
- B. When the appropriate prompt appears during POST, press <Ctrl+R> to enter the RAID BIOS setup utility.



To create a new array, press <Enter> on the “Create Array” option.

*Be sure to delete the existing disk arrays before creating a new array.



Use the arrow keys to select the hard drives to be included in the RAID array and press <Ins>. The selected hard drives will be shown in green. To use all of the hard drives, simply press <A> to select all. Then press <Enter>.

```

AMD-RAID Array Configuration (Build: 6.1.0-00118)
6595FE235EEFBC7  SATA RW 1.9TB WDC WD20EARX-22PASB  WD-WCA2A6752732

Arrays _____ Disks _____

Create Array _____
Disks: 0,1

User Input _____
Select Disks to Use

Available Keys
<↑><↓><→><←>=Choose, <Esc>=Back
<Ins>=Select, <A>=All, <Enter>=Done
  
```

Use the arrow keys to select a RAID level you want. Press <Enter> to confirm your selection.

```

AMD-RAID Array Configuration (Build: 6.1.0-00118)
RAID1: Mirror set - puts identical data on each of two disks for protection

Arrays _____ Disks _____

Create Array _____
Disks: 0,1
Type: RAID1

User Input _____
Select Array Type to Create
RAID5      RAID10N
RAID0      RAID1N
RAID1      Volume
RAID10     RAIDABLE
RAID50

Available Keys
<↑><↓><→><←>=Choose, <Esc>=Back
<Enter>=Select Menu Item
  
```

Use the up/down arrow key or <PAGEUP> /<PAGEDOWN> to adjust the size and press <Enter>.

```

AMD-RAID Array Configuration (Build: 6.1.0-00118)

Arrays _____ Disks _____

Create Array _____
Disks: 0,1
Type: RAID0
Total Size: 2.1TB

User Input _____
Choose Size to Make Array

Size Chosen: 2TB Limit
DOS Size: 1.9TB
Exactly: 2,199,000,000,000

Available Keys
<PAGEUP><↑><PAGEDOWN><↓>=Change Size
<Enter>=Complete, <Esc>=Go Back
  
```

Select a caching mode and press <Enter> to proceed.

AMD-RAID Array Configuration (Build: 6.1.0-00118)	
Read and Write-back Caching. (Some data may be lost in a crash)	
Arrays	Disks
	0-00,2.0TB,Ready 1-01,2.0TB,Ready
Create Array	
Disks: 0,1 Type: RAID0 Total Size: 3.9TB	
Caching Mode: Read/Write User Input	
Select Caching Mode	
Read/Write Read Only None	
Available Keys <↑><↓><→><←>=Choose, <Esc>=Back <Enter>=Select Menu Item	

Press <C> to confirm and then press <Esc> to return to the previous screen.

AMD-RAID Array Configuration (Build: 6.1.0-00118)	
Arrays	
Disks	
0-00,2.0TB,Ready 1-01,2.0TB,Ready	
Create Array	
Disks: 0,1 Type: RAID0 Total Size: 3.9TB	
Caching Mode: Read/Write User Input	
Confirm Creation of Array	
Available Keys <C>=Confirm <Esc>=Go Back, <MD>=Main Menu	

When completed, you will see the new array on the main screen. Press <Esc> to exit the RAID BIOS utility.

AMD-RAID Array Configuration (Build: 6.1.0-00118)	
Continues booting process from where BIOS entered	
Arrays	Disks
1---RAID0, 3.9TB, Normal(R/W)	0-00,2.0TB,Online 1-01,2.0TB,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 Continue to Boot	
License Level: 50	
Available Keys <↑><↓><→><←>=Choose, <Esc>=Back <Enter>=Select Menu Item	

STEP 3.1: Copy RAID driver to a USB flash drive

You can choose either STEP 3.1 or STEP 3.2 to finish the configuration.

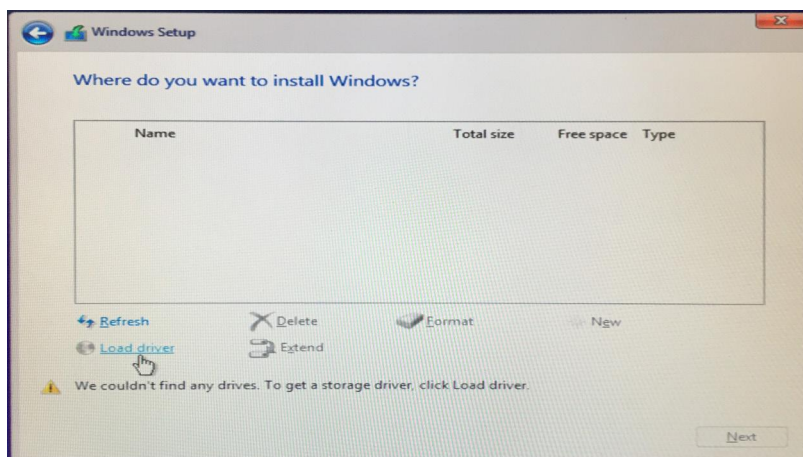
- A. Please install the DVD-ROM.
- B. During system boot, press <F2> or key to enter UEFI setup utility.
- C. Plug a USB drive into one of the USB port.
- D. Insert the Support CD into the DVD-ROM drive.
- E. Go to Tools→ Easy RAID Installer
- F. Follow instructions to finish the driver copy process.

STEP 3.2: Download driver from ASRock Rack's website

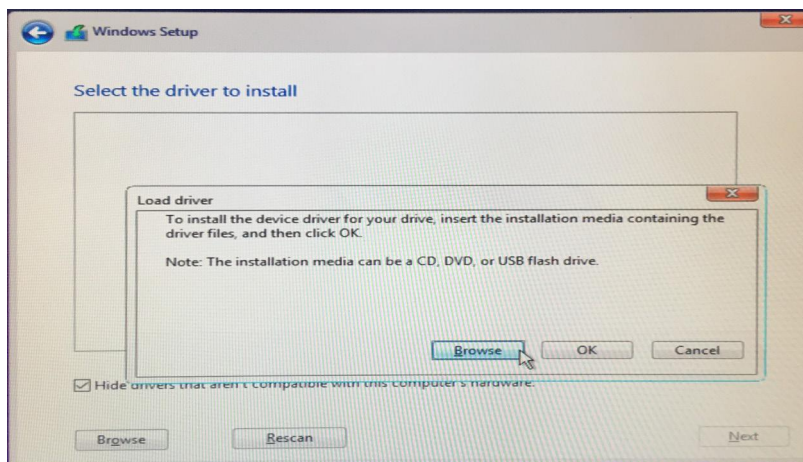
- A. Please download the "SATA Floppy Imaged driver" from ASRock Rack's website and unzip the file into your USB flash disk.

STEP 4: Windows installation

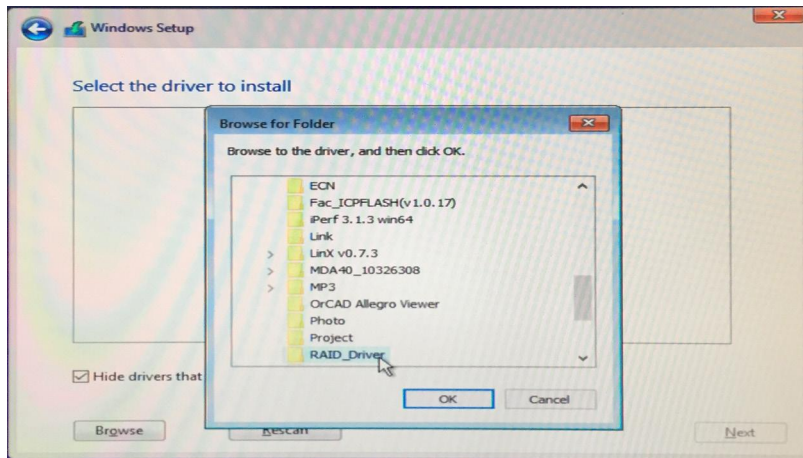
- A. During Windows installation process, when Disk selection page show up, please click <Load Driver>.



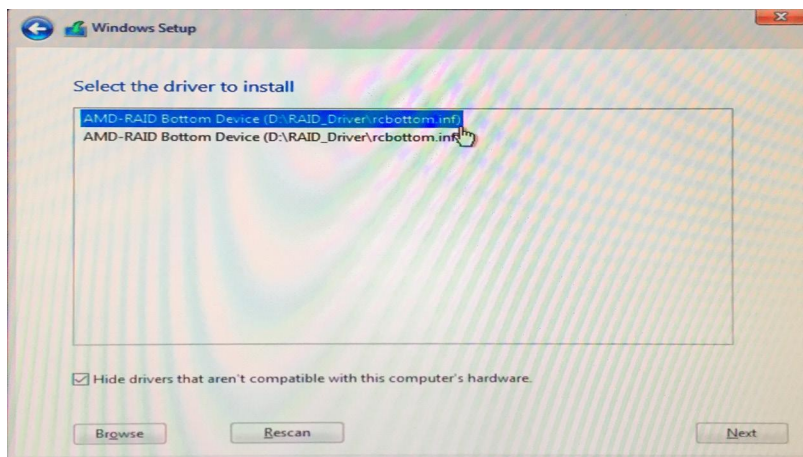
- B. Click <Browse> to find the driver inside your USB flash drive.



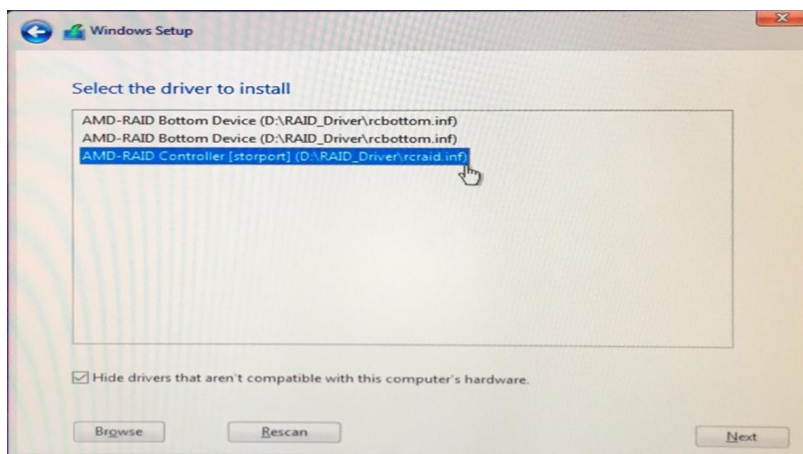
- C. For 32bit OS, the driver is under /I386 directory. For 64bit OS, the driver is under /AMD64 directly. Please select the correct driver for your Windows version (Windows 10).



- D. Select "AMD-RAID Bottom Device" and then click <Next>.

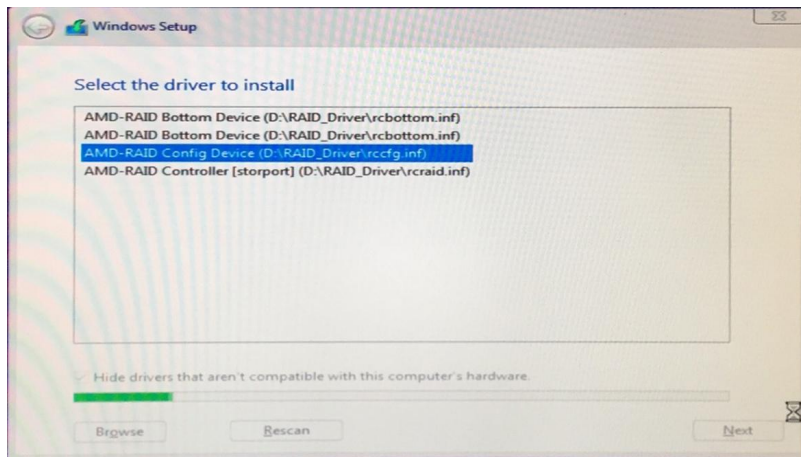


- E. Click <Browse> again to find the driver inside your USB flash drive.
F. Select "AMD-RAID Controller storport" and then click <Next>.

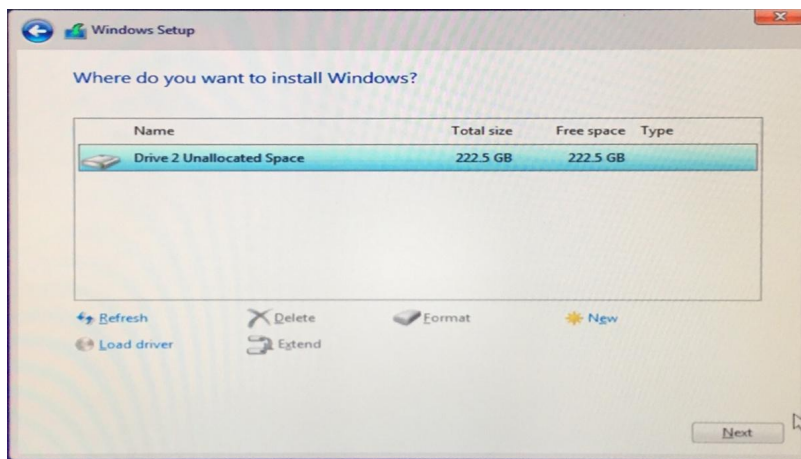


- G. Click <Browse> again to find the driver inside your USB flash drive.

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



- I. After RAID driver is loaded, the RAID disk will show up.



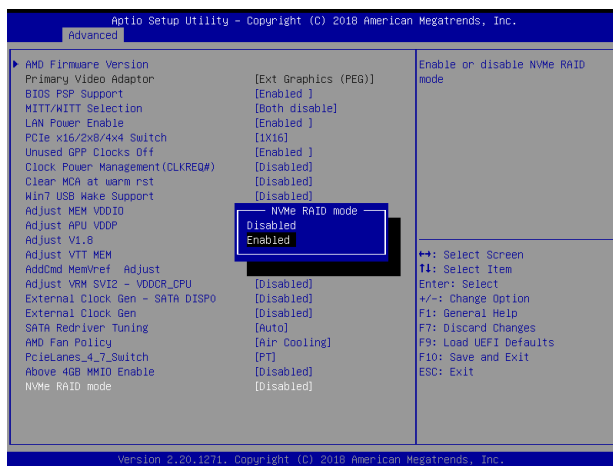
- J. Please follow Windows installation instruction to finish the process.

1.4 UEFI RAID Configuration (for AMD X399, X470, B450, X370, B350, A320 and A300 Chipsets)

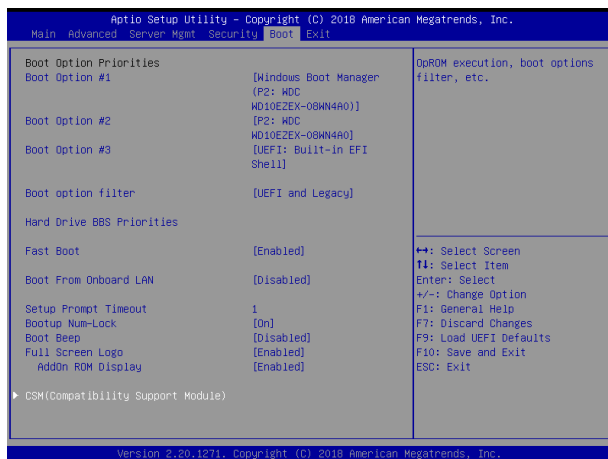
Set up a RAID array using UEFI Setup Utility.

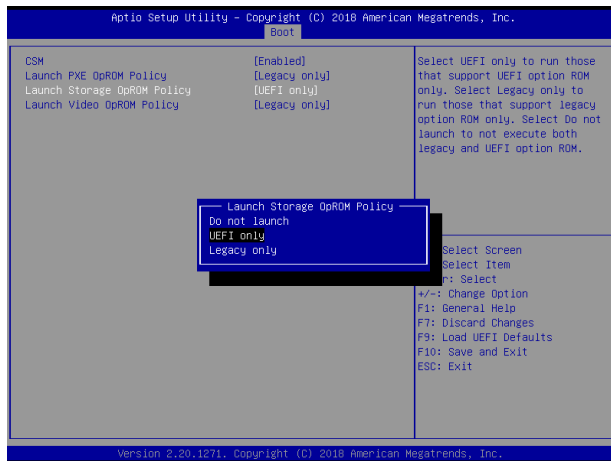
STEP 1: Set up UEFI and create a RAID array

- During system boot, press <F2> or key to enter UEFI setup utility.
- Go to Advanced → Storage Configuration.
- Set the “PT SATA Mode” option to <RAID>
- (This step is only for NVMe RAID on X399 chipset): Go to Advanced → AMD PBS and set “NVMe RAID mode” to <Enabled >. Then click <F10> to save to exit.



- Go to Boot → CSM(Compatibility Support Module) → Set the CSM option to <Enable> → Set “Launch Storage OpROM Policy” to <UEFI only>.

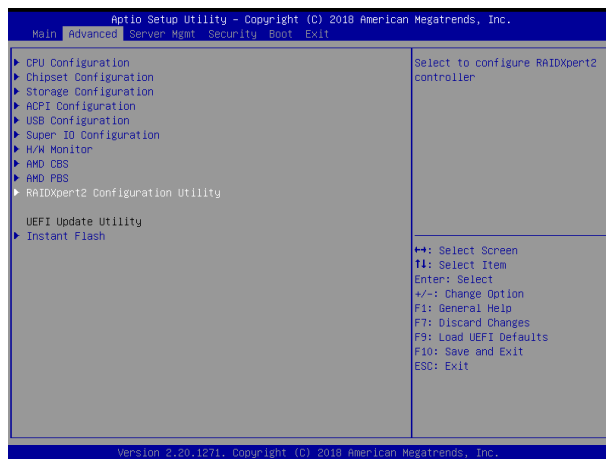




F. Click <F10> to save to exit.

G. Go to Advanced → RAIDXpert2 Configuration Utility → Array Management → Create Array → Select Physical Disks → Check All → Apply Changes → Create Array.

*Be sure to delete the existing disk arrays before creating a new array.



H. Click <F10> to save to exit.

STEP 2.1: Copy RAID driver to a USB flash drive

You can choose either STEP2.1 or STEP2.2 to finish the configuration.

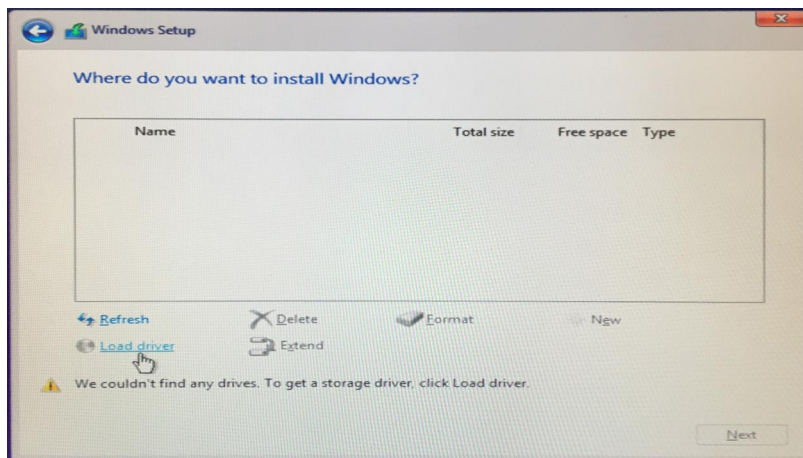
- A. Please install the DVD-ROM.
- B. During system boot, press <F2> or key to enter UEFI setup utility.
- C. Plug a USB drive into one of the USB port.
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- F. Follow instructions to finish the driver copy process.

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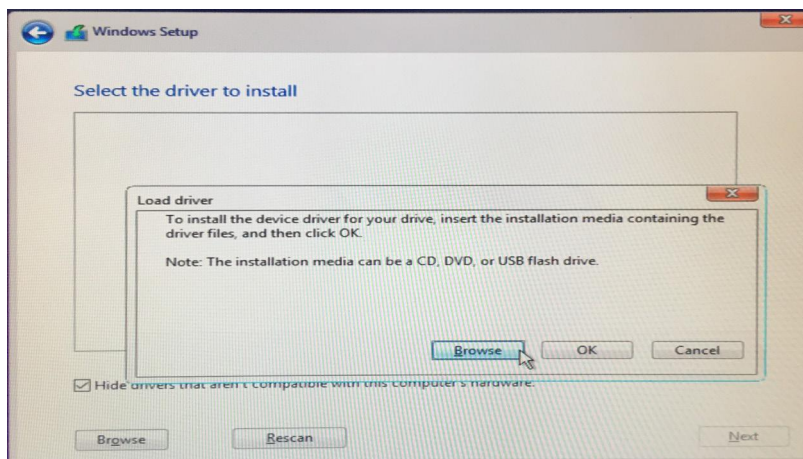
- A. Please download the "SATA Floppy Imaged driver" from ASRock Rack's website and unzip the file into your USB flash disk.

STEP 3: Windows installation

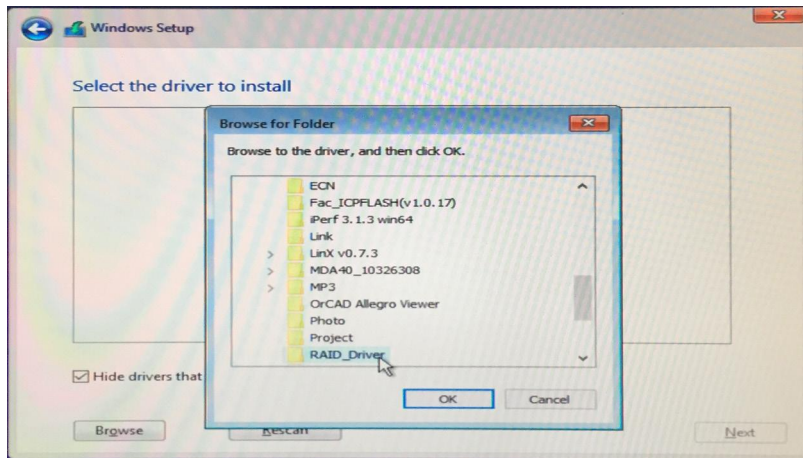
- A. During Windows installation process, when Disk selection page show up, please click <Load Driver>.



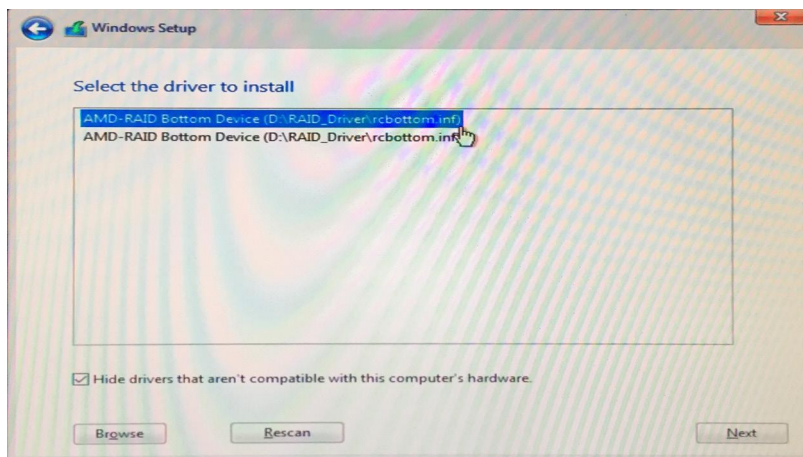
- B. Click <Browse> to find the driver inside your USB flash drive.



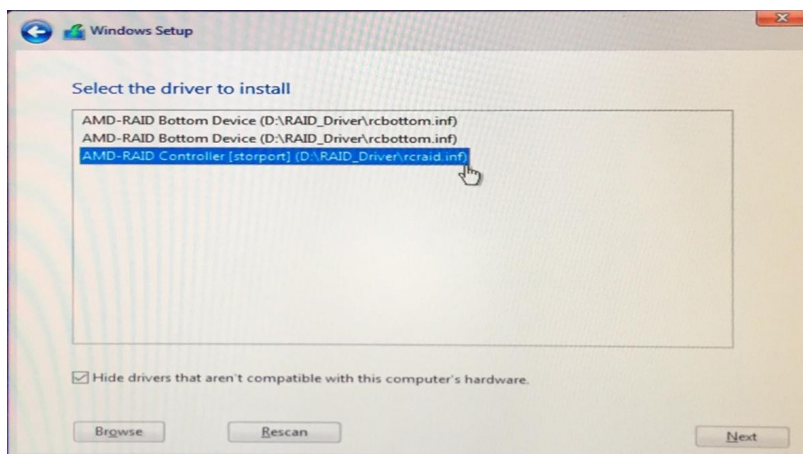
- C. For 32bit OS, the driver is under /I386 directory. For 64bit OS, the driver is under /AMD64 directly. Please select the correct driver for your Windows version (Windows 10).



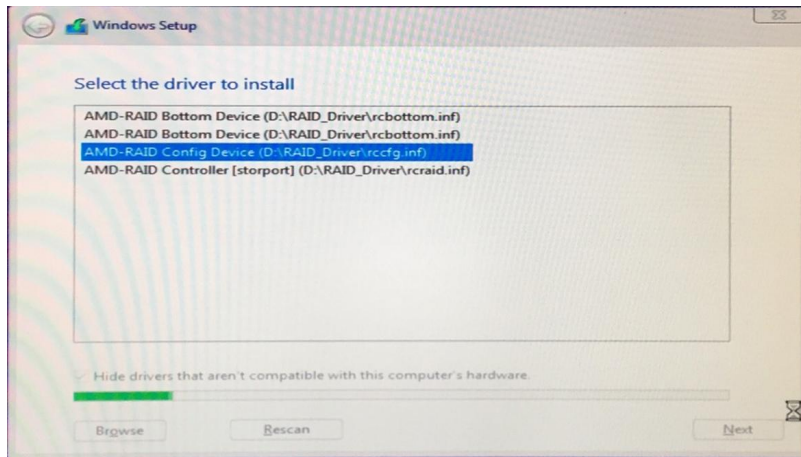
- D. Select "AMD-RAID Bottom Device" and then click <Next>.



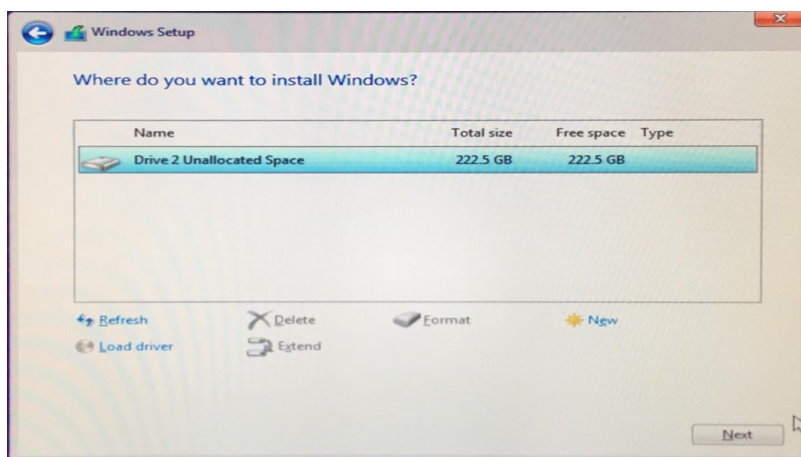
- E. Click <Browse> again to find the driver inside your USB flash drive.
F. Select "AMD-RAID Controller storport" and then click <Next>.



- G. Click <Browse> again to find the driver inside your USB flash drive.
H. Select "AMD-RAID Config Device" and then click <Next>.



- I. After RAID driver is loaded, the RAID disk will show up.

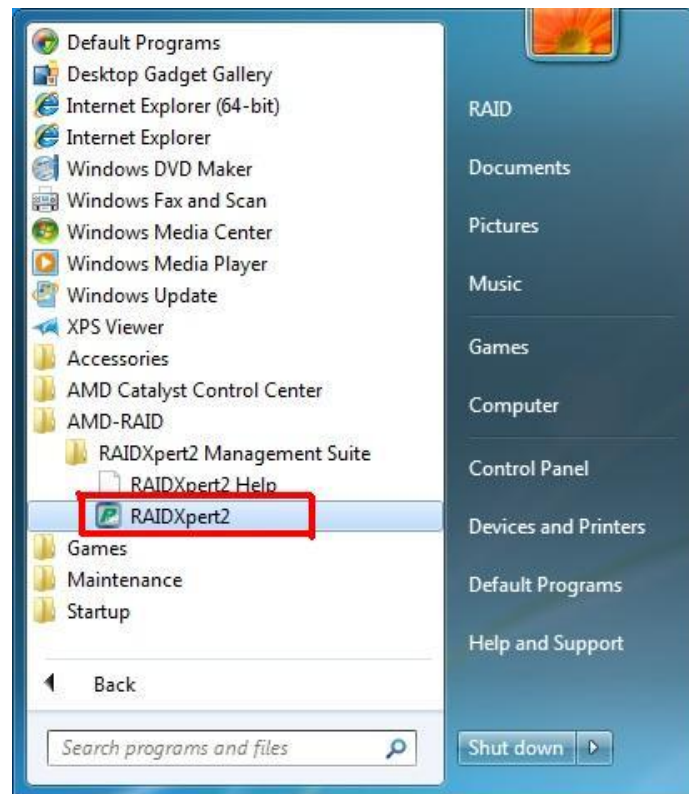


- J. Please follow Windows installation instruction to finish the process.

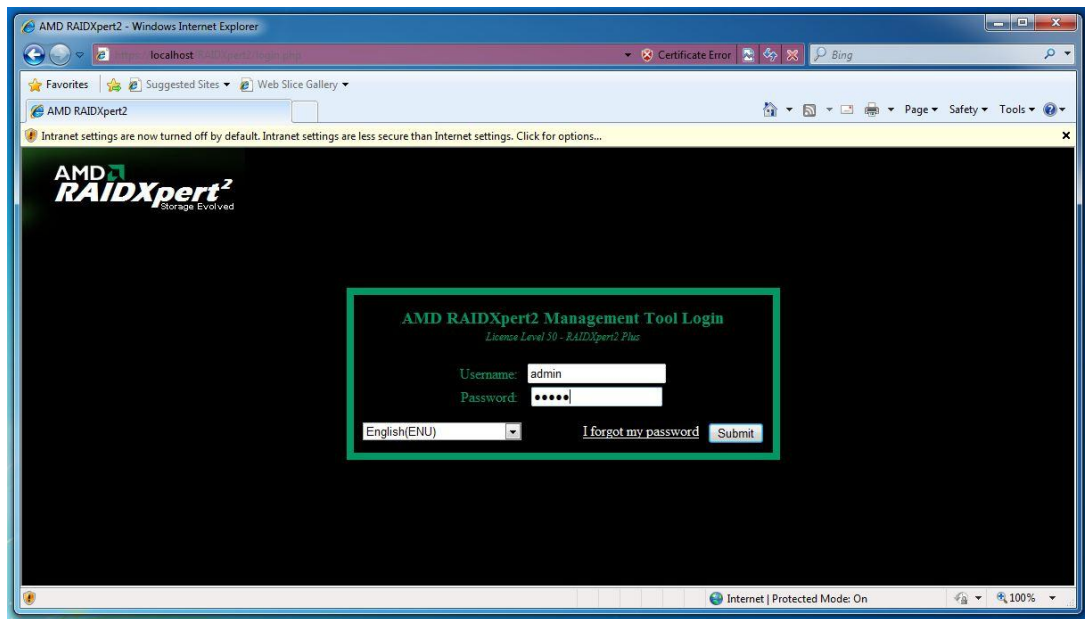
2. AMD Windows RAID Installation Guide

Using RAIDXpert2 to Create RAID Array in Windows

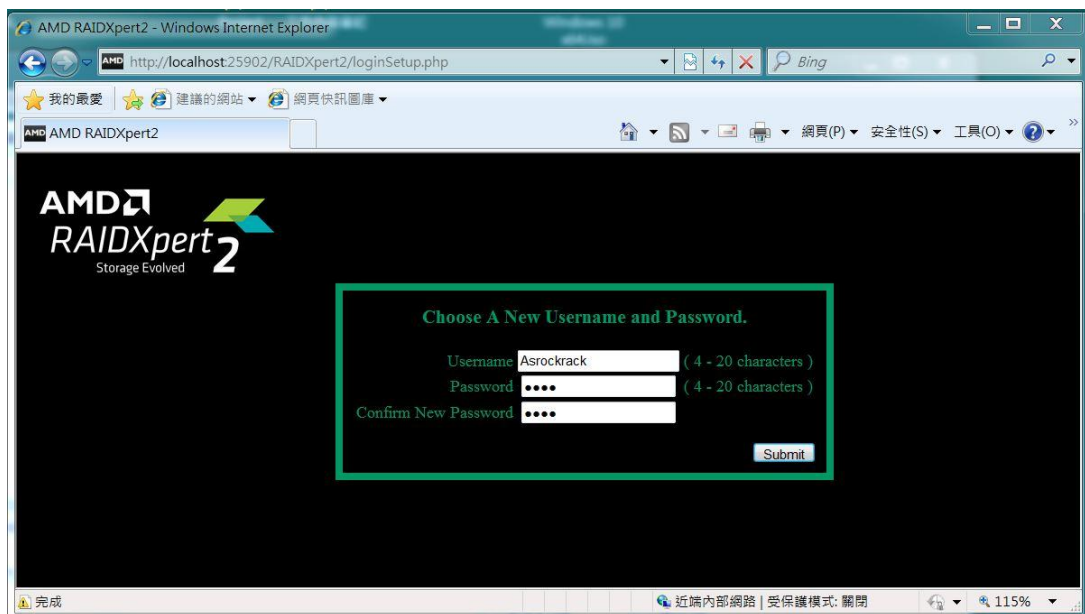
1. Execute RAIDXpert2 in the Windows Programs menu.



2. When the login screen appears, type “admin” in the Login ID field. Type “admin” again in the Password field.



3. Create new username and password. Then log in to RAIDxpert with new username & password.



4. Be sure to delete the existing disk arrays before creating a new array.

The screenshot shows the AMD RAIDGen2 web interface in Internet Explorer. The 'Array' tab is selected, displaying a table of disk arrays. The table has columns: Disk #, Capacity, Port Type, GS, State, Model, Serial No., Firmware, Space Available, Largest Available, and Features. Three arrays are listed, with the second and third rows highlighted in red. Below the array table is a table for 'AMD RAIDGen2 Active Volumes' with columns: Device #, Partition, Array Name, Type, Total Capacity, State, Task, Task State, Progress, Pri, Scan, and Cache. One volume is listed. At the bottom is a 'Controller Event Log' table with columns: #, Date, Event, Priority, and Text. One event is listed.

Disk #	Capacity	Port Type	GS	State	Model	Serial No.	Firmware	Space Available	Largest Available	Features
0.0	2.00TB	6S SATA NCQ	No	Online	WDC WD20EARS-22P6B0	WD-WCAZM76087	51.04B51	0.00MB	0.00MB	48bit NCQ, FFDMA WriteBack, Read
0.2	2.00TB	6S SATA NCQ	No	Online	WDC WD20EARS-22P6B0	WD-WCAZM75732	51.04B51	2.00TB	2.00TB	48bit NCQ, FFDMA WriteBack, Read
0.3	2.00TB	6S SATA NCQ	No	Online	WDC WD20EARS-00BFB0	WD-WCAZAH154306	51.04B51	2.00TB	2.00TB	48bit NCQ, FFDMA WriteBack, Read

Device #	Partition	Array Name	Type	Total Capacity	State	Task	Task State	Progress	Pri	Scan	Cache
1	C:	NONE	VOLUME	2.00TB	NORMAL	NOT ACTIVE	NOT ACTIVE	0%	9	No	RW

#	Date	Event	Priority	Text
11	9/24/2013 6:08:27 AM	1014	Informational	- Array 2 has been deleted.

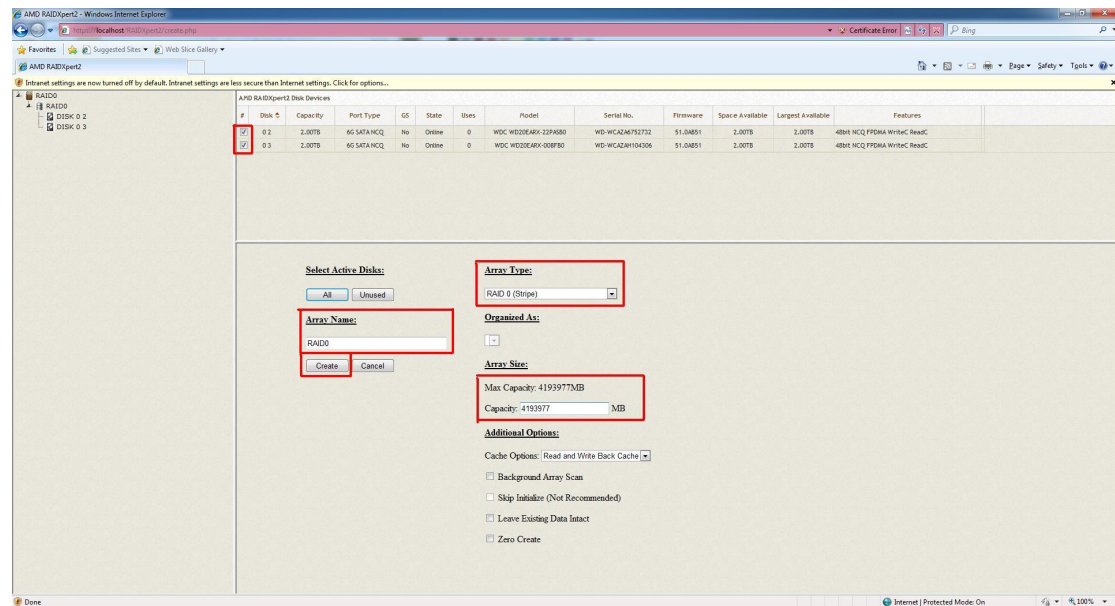
5. To create array, Click on Array → Create.

The screenshot shows the AMD RAIDGen2 web interface in Internet Explorer. The 'Array' tab is selected, and the 'Create' button is highlighted with a red box. The interface also shows the 'Disk' tab, 'View' tab, 'Options' tab, and 'Help' tab. The 'Create' button is located in the left sidebar. The main content area shows the same disk arrays and active volumes as the previous screenshot.

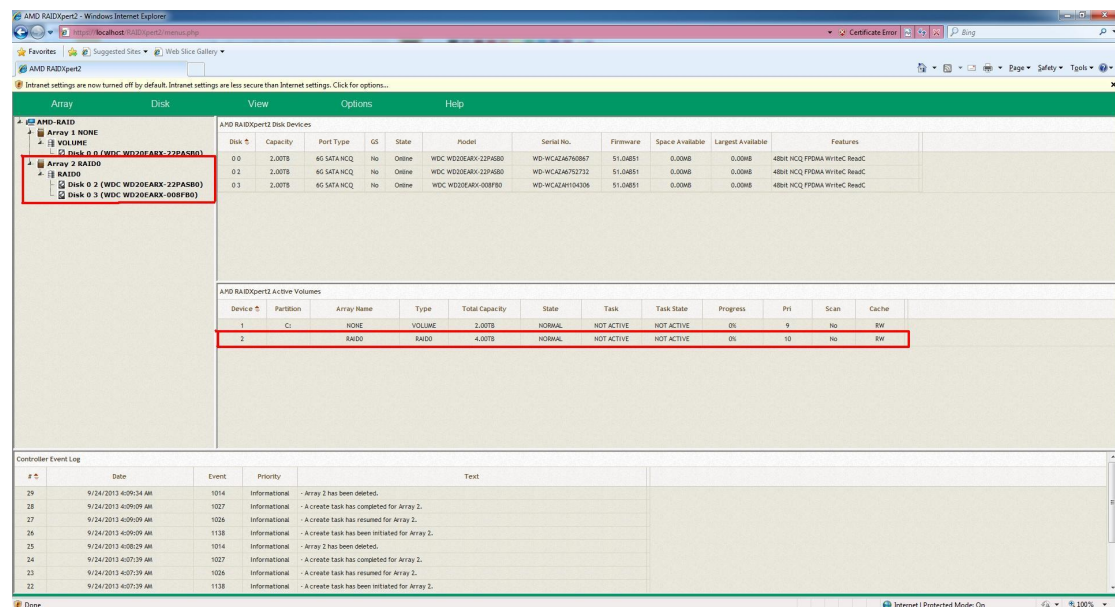
6. Select the disks to be included in the RAID array.

Select Array Type

Enter Array Name & Array Size. Then click **Create** to create a RAID array.



7. Check if the array is created successfully.



8. In Disk Management, create partition and initialize the disk as GPT.

