AMD RAID Installation Guide

# 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 <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.
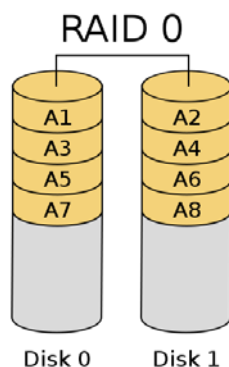

WARNING!!

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.
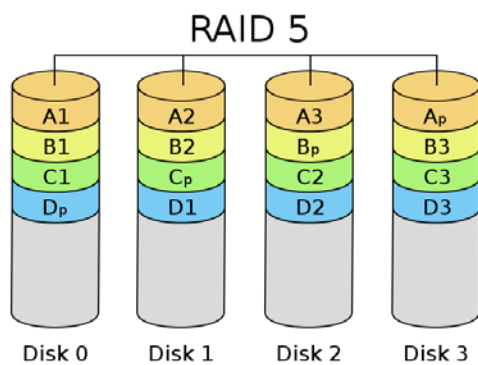
RAID 1 (Data Mirroring)

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 1

Disk 0   Disk 1
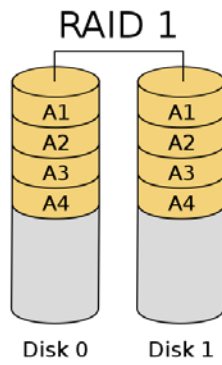
RAID 5 (Block Striping with Distributed Parity)

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.

Disk 0   Disk 1   Disk 2   Disk 3

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.

Disk 0   Disk 1   Disk 2   Disk 3
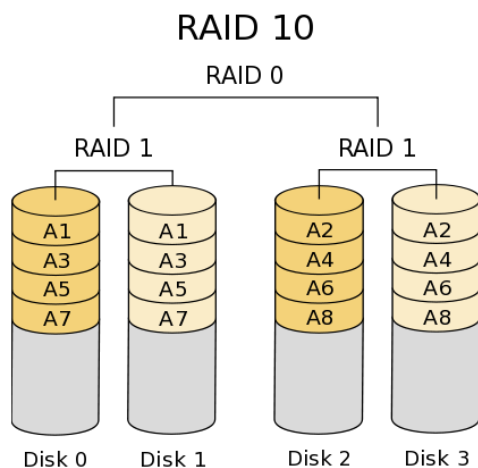
1.2   RAID Configurations Precautions

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 UEFI RAID Configuration

Set up a RAID array using UEFI Setup Utility.

STEP 1: Set up UEFI and create a RAID array

A. During system boot, press <F2> or <Del> key to enter UEFI setup utility.

B. Go to Advanced→ Storage Configuration.

C. Set the "SATA Mode" option to <RAID>.

D. Click <F10> to save to exit.

E. (This step is only for NVMe RAID on X399 / X570 chipset):

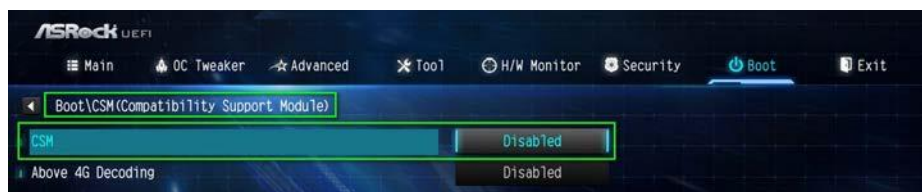Go to Advanced→AMD PBS and set "NVMe RAID mode" to <Enabled >. Then click <F10> to save to exit.

F. Go to Boot→CSM and set "Launch Storage OpROM policy" to <UEFI only>.

or

Go to Boot→CSM and set "Launch CSM" to <Disabled>.

G.   Click <F10> to save your changes and exit, and then enter the BIOS Setup again.

H.   After saving the previously changed settings via F10 and rebooting the system, "RAIDXpert2 Configuration

Utility" submenu becomes available.
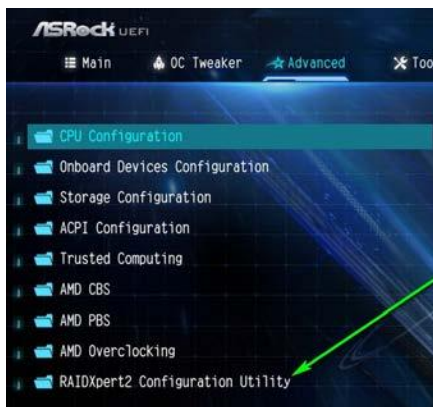
I.   Go to Advanced→RAIDXpert2 Configuration Utility→ Array Management, and then delete the existing disk
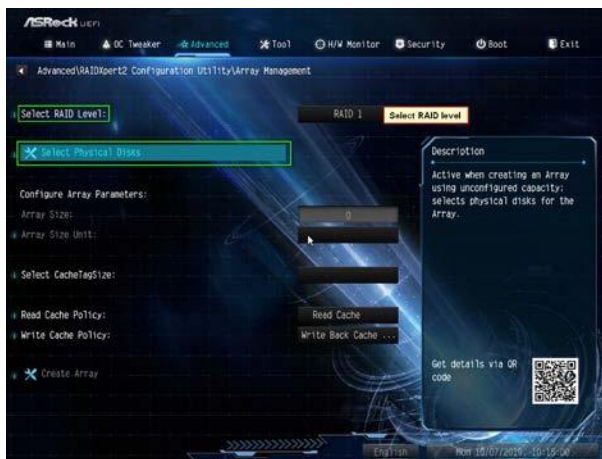
arrays before creating a new array.

Even if you have not configured any RAID array yet, you might have to use "Delete Array" first.
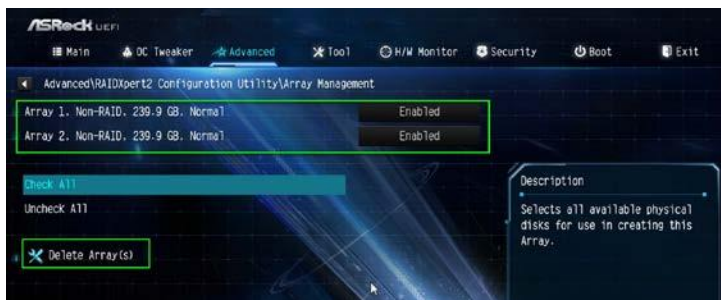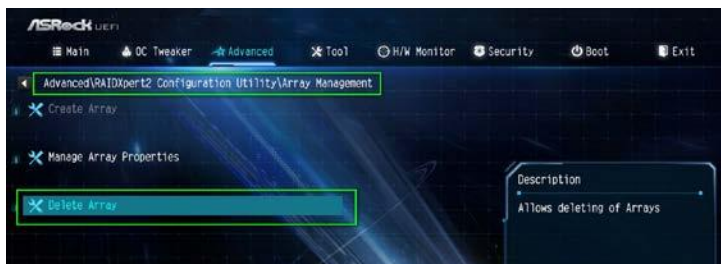
J.   Go to Advanced→RAIDXpert2 Configuration Utility→ Array Management→Create Array

Select "RAID Level" and then "Select Physical Disks".

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

Select Check All→Apply Changes

Select "Create Array".

K.   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 <Del> 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 2.2: Download driver from ASRock's website

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

STEP 3: Windows installation

Insert the USB drive with Windows 10 installation files. Then restart the system. While this 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.

A.   During Windows installation process, when Disk selection page show up, please click <Load Driver>.
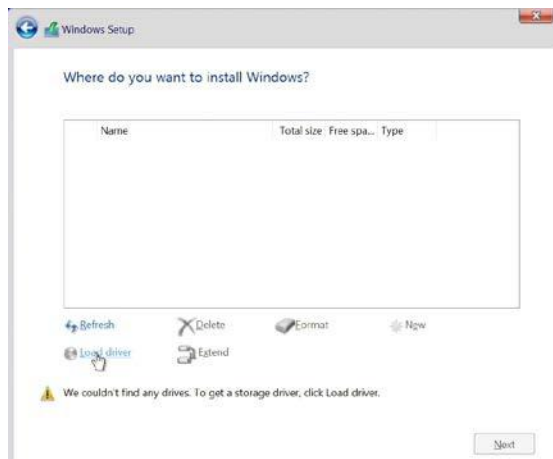
B.   Click <Browse> to find the driver inside your USB flash drive.

Three drivers must be loaded. This is the first. Using SATA/NVMe RAID driver package (version 9.2.0.127) from

AMD website. It might look different when using a different version driver package.
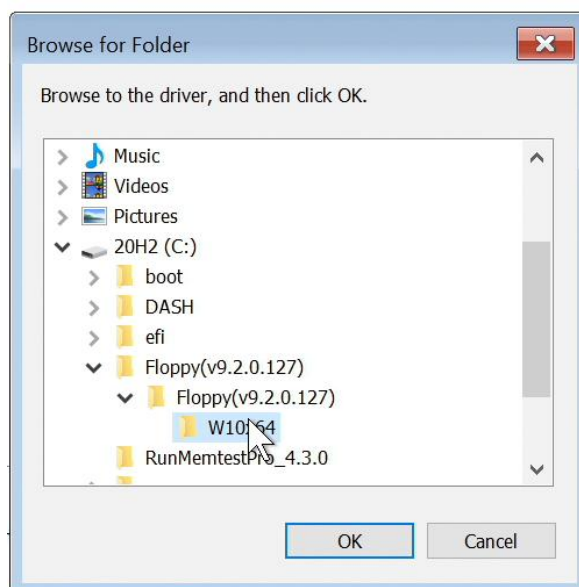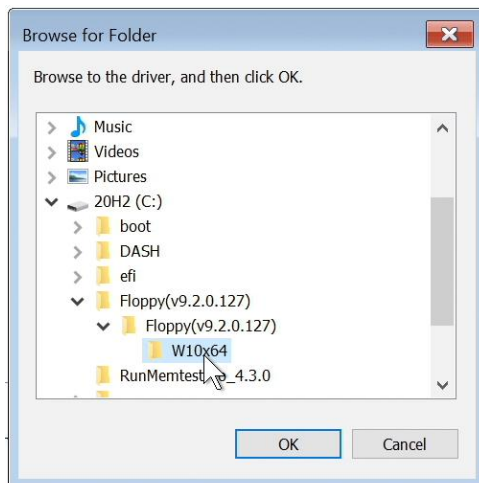
C. Select "AMD-RAID Bottom Device" and then click <Next>.
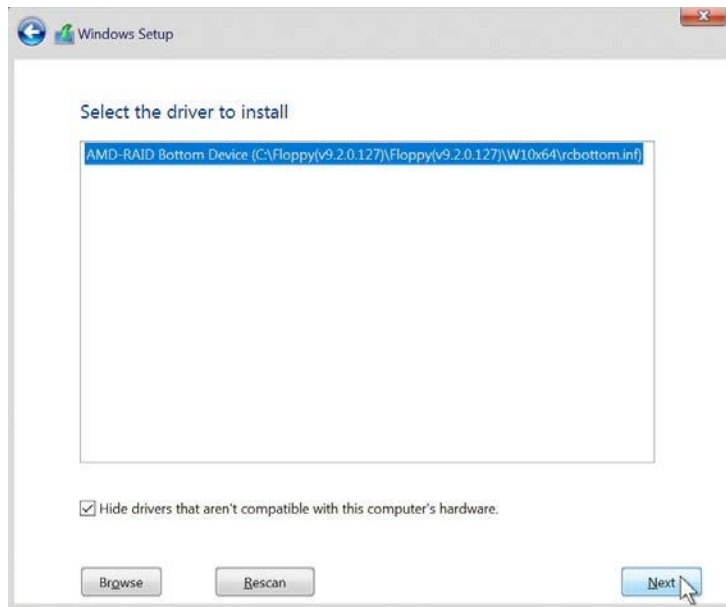
D. Load the second driver.
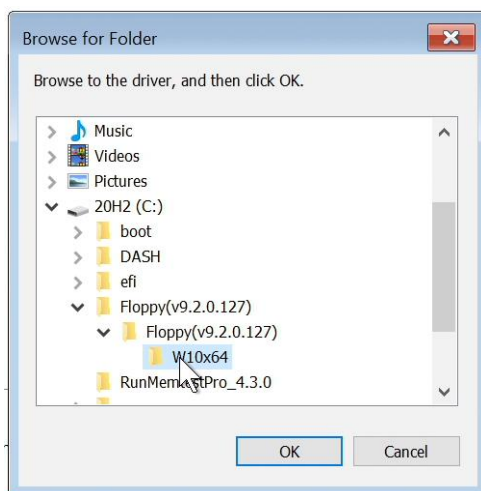
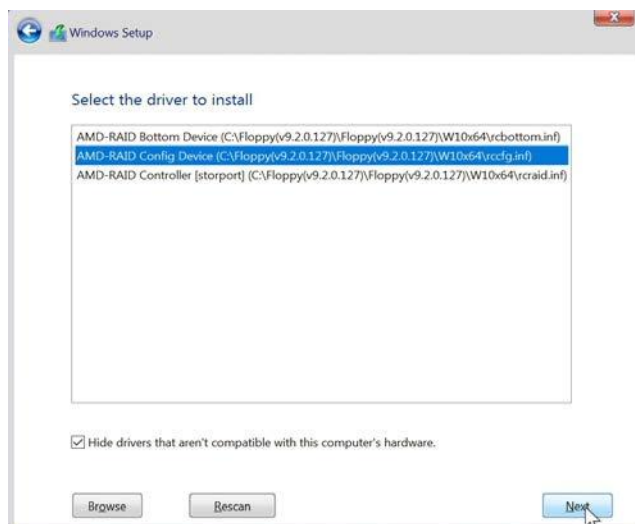E. Select "AMD-RAID Controller[storport]" and then click <Next>.

10

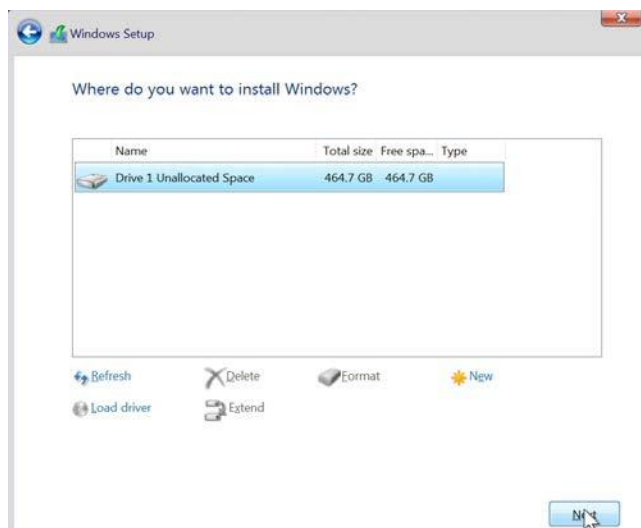F.   After RAID driver is loaded, the RAID disk will show up. Load the Third driver.

NOTE: During the two-step driver installation process, the drive partitions on each drive in the array will show up.
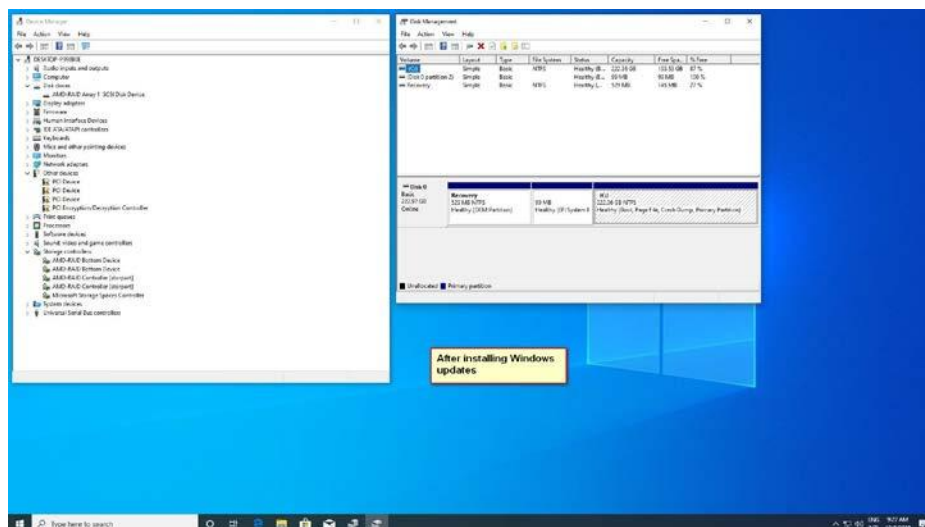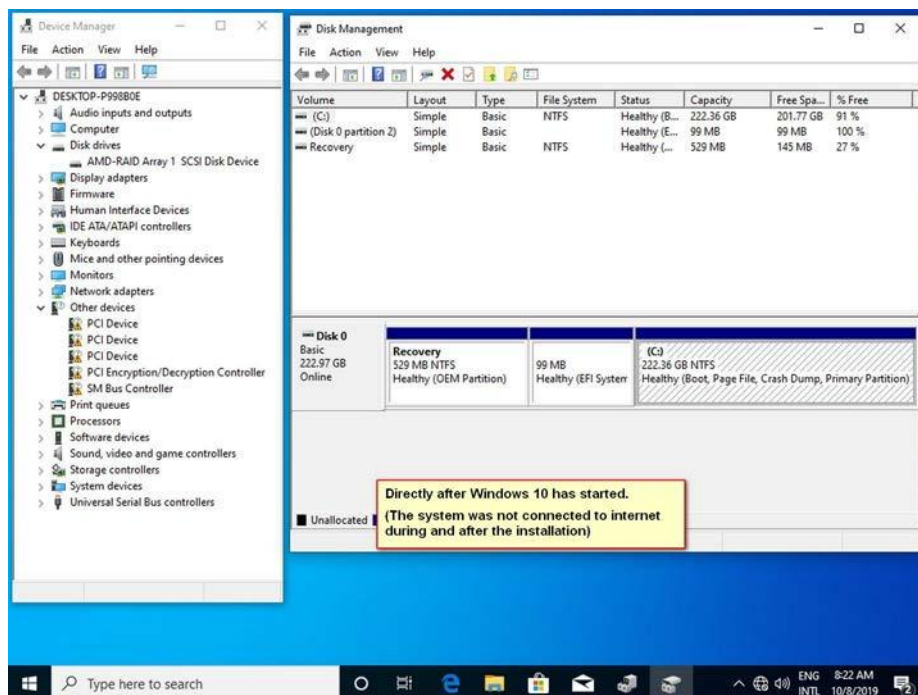
Please ignore this.
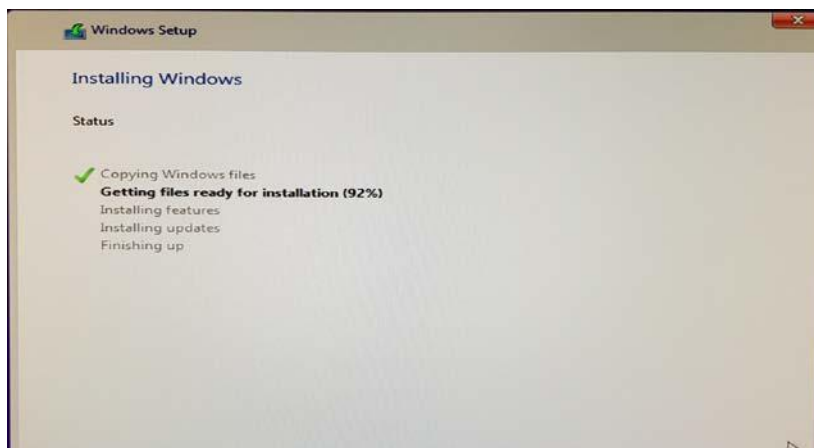
G.   Select "AMD-RAID Config Device" and then click <Next>.


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

I. Please follow Windows installation instruction to finish the process.

Directly after Windows 10 has started.
(The system was not connected to internet during and after the installation)

After installing Windows updates

After installing AMD chipset drivers (version 1.9.27.1033)

After installing "AMD RAID Installer" (version 9.2.0.127) from AMD website.

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

2.   AMD Windows RAID Installation Guide
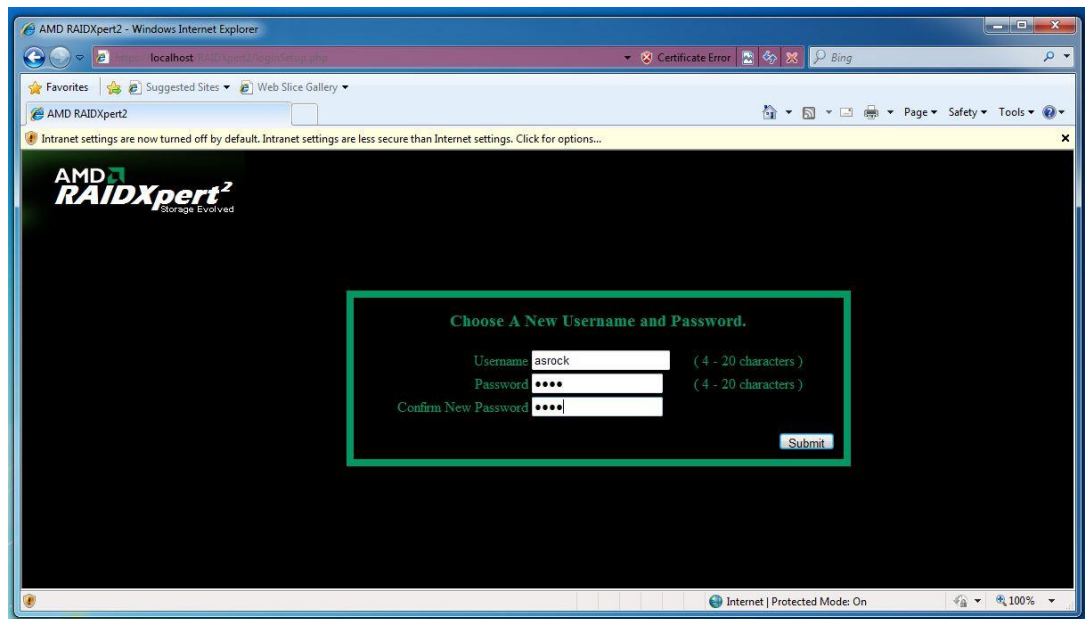
Using RAIDXpert2 to Create RAID Array in Windows

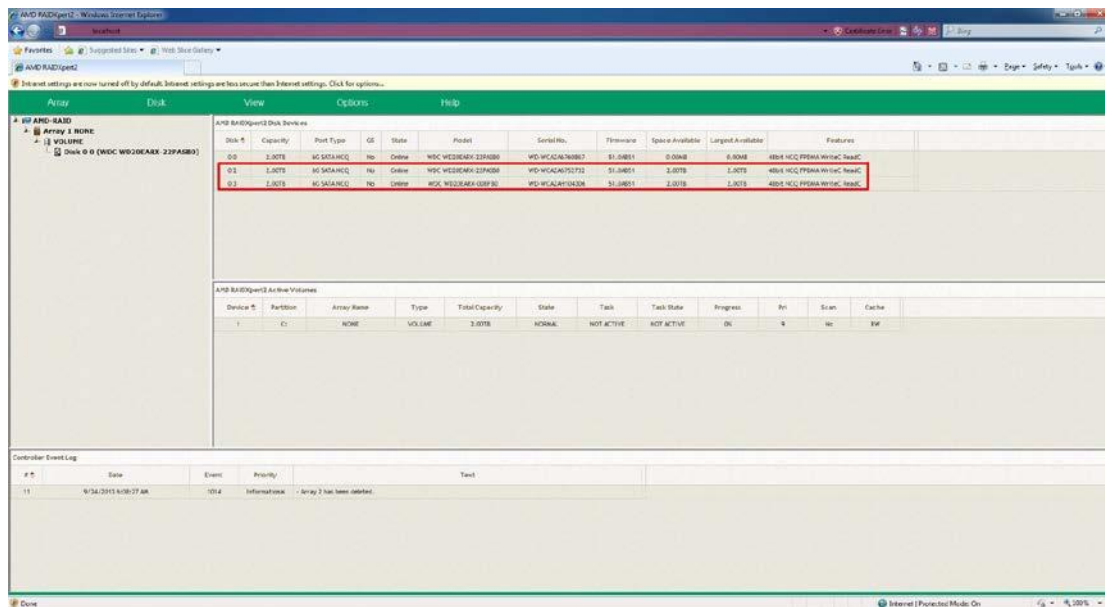1.   Execute RAIDXpert2 in the Windows Programs menu.
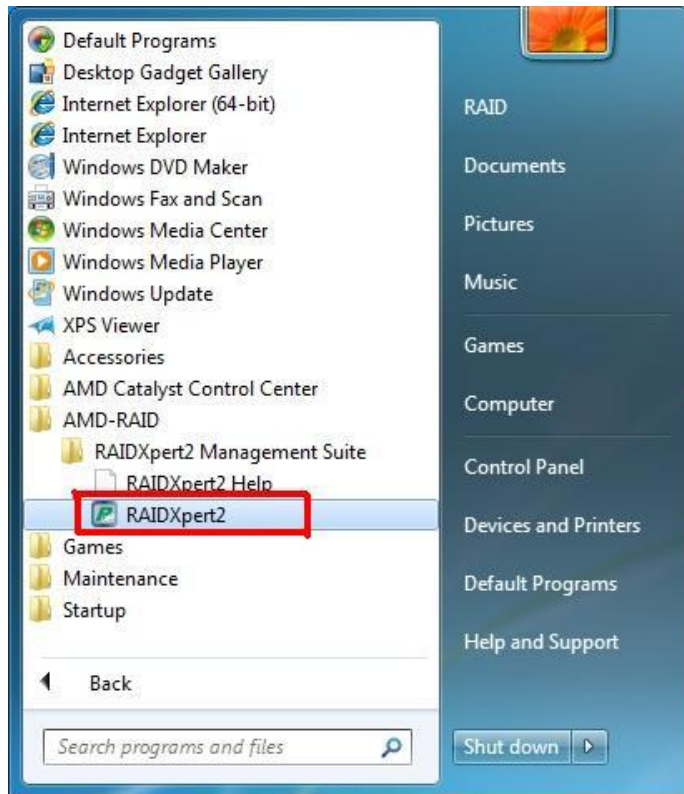
2. When the login screen appears, type "admin" in the Login ID field. Type "admin" again in the Password field.
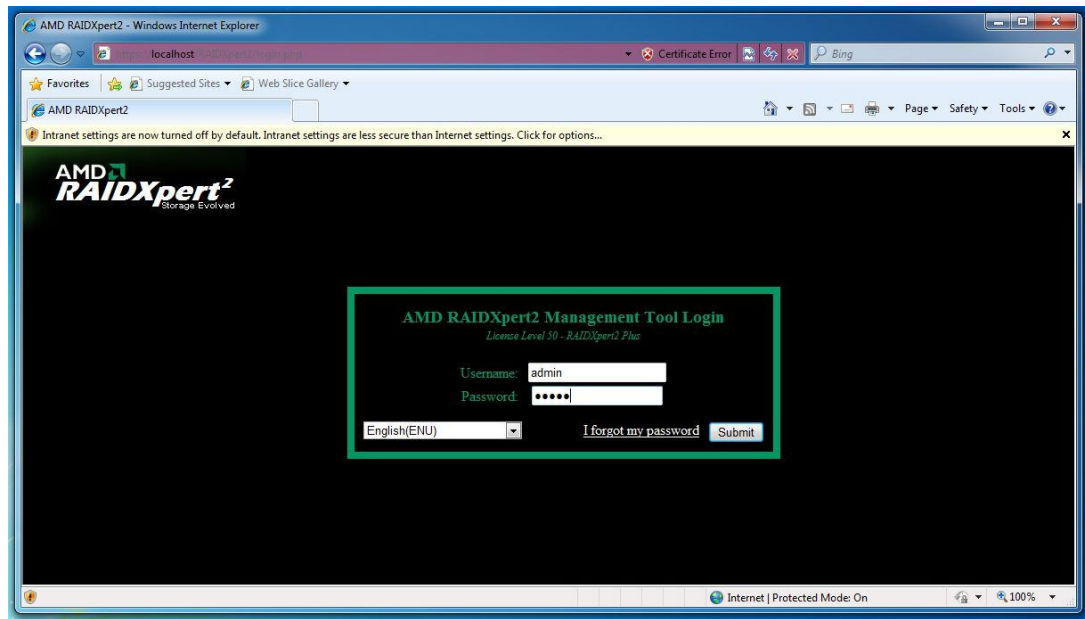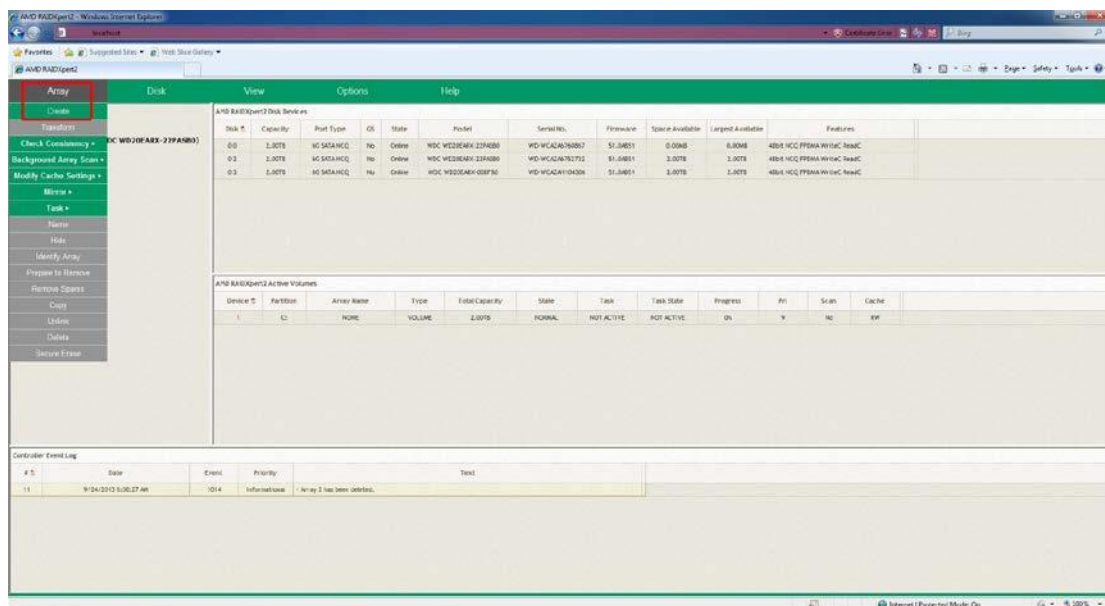

3. Create new username and password. Then log in to RAIDXpert with new username & password.

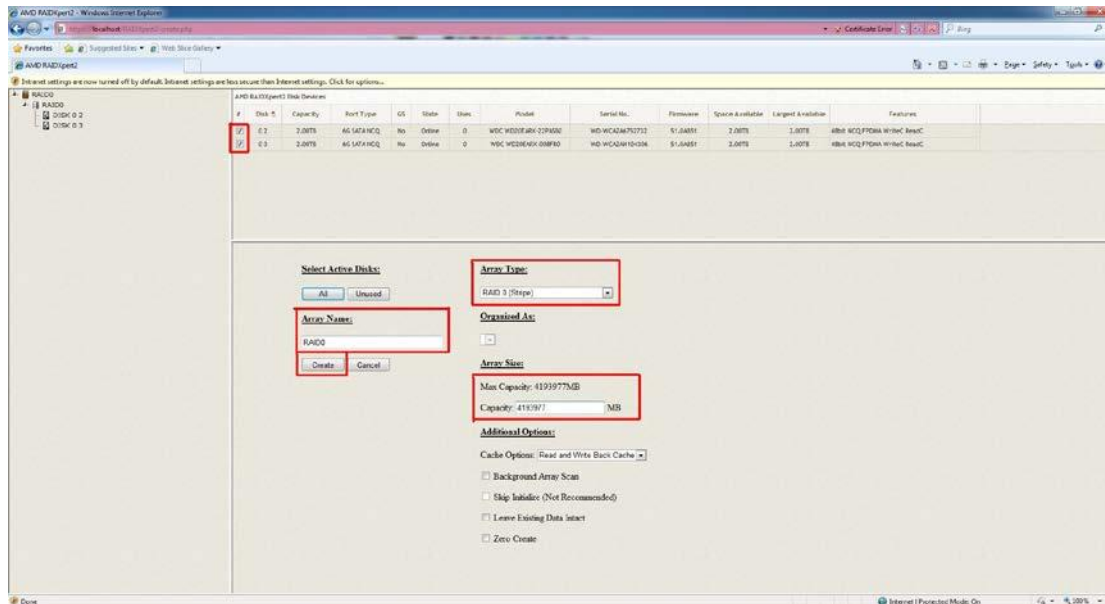4.   Be sure to delete the existing disk arrays before creating a new array.

5.   To create array, Click on Array → Create.
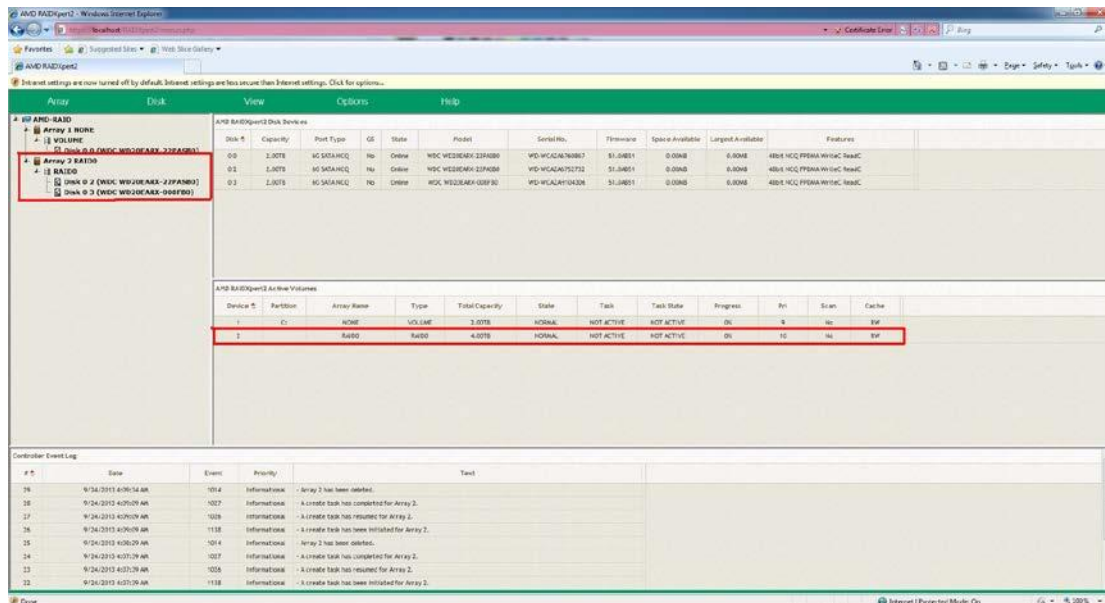
6. Select the disks to be included in the RAID array.

   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.