



AMD Ryzen™ Threadripper™ NVMe RAID  
Quick Start Guide  
RC-9.1.0 Release  
Version 1.0

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# 1 GENERAL INFORMATION

## 1.1 Purpose

This Installation Guide is designed to assist with system setup in RAID Mode, by performing these general procedures:

- Copy device drivers to removable storage media for the following operating systems:
  - ✓ Microsoft® Windows 10 x64

Loading the device drivers on a system at the time that the Windows operating system is installed, then loading the AMD-RAIDXpert2 (Web GUI)

## 1.2 System requirements

Component	Requirements
Memory (RAM)	Minimum: 8 GB Recommended: 32 GB
Hard Disk	One to Fourteen SATA HDD's, SATA SSD's or NVMe
Max number of NVMe devices	10
Max Controller Count	11 (2 Controller with Device ID 7917, 1 controller with device ID 43BD and NVMe (1 controller per NVMe)
Supported AMD Controllers	AMD SP3-Series Chipsets
Systems used for testing	Summit SP3 based Whitehaven's

### 1.3 Information about supported Configuration by installer with this release: -

OS Loaded in Drive	RAID Controller in BIOS		NVME/ RAID mode in PBS BIOS Option	Status
	Device ID 43BD	Device ID 7917		
SoC RAID	SATA	SATA	RAID	CATALYST INSTALL MANAGER should prompt user to install RAID driver with Warning Message
SoC RAID	RAID	RAID	RAID	CATALYST INSTALL MANAGER should prompt user to install RAID driver with Warning Message
NvMe	RAID	RAID	NvMe	RAID Driver installation shall be blocked for all controllers
RAID/NVMe	SATA	SATA	RAID	CATALYST INSTALL MANAGER should prompt user to install RAID driver with Warning Message
SoC RAID	SATA	SATA	NvMe	CATALYST INSTALL MANAGER should prompt user to install RAID driver with Warning Message
NvMe	SATA	SATA	NvMe	RAID Driver installation shall be blocked for all controllers
SoC RAID	RAID	RAID	NvMe (But no NVMe devices are connected to the system)	RAID driver installation should happen for AMD and PT controllers
SoC RAID	SATA	RAID	RAID	Not supported with this release
SoC RAID	RAID	SATA	RAID	Not supported with this release

### 1.4 Generic system setup

A generic system setup process is described below.

1. Copy the **AMD-RAID** drivers to a removable storage medium. *(Refer to Section 2.1)*
2. Power-on the system.
3. Access the platform BIOS window for the system
  - a. For supported AMD chipsets, set the SATA mode as RAID or enable NVMe RAID. *(Refer to Section 3.1)*
  - b. This enables the loading of the **AMD-RAID** UEFI driver
4. Initialize the disks, using the RAIDXpert2 Configuration Utility or UEFI driver. *(Refer to Section 4.1)*
5. Create arrays, using the HII Configuration Utility or UEFI driver.
6. Load the **AMD-RAID** drivers during the system operating system installation. *(Refer to Section 5.1)*
7. Complete the rest of the operating system installation.
8. Install the OS RAID Management Suite (AMD RAIDXpert2). *(Refer to Section 6.1)*

#### **IMPORTANT:**

***To protect your data; always perform a backup prior to installing any new, major hardware or software. If you are adding NVMe as RAID to your existing RAID arrays then update all existing RAID controller drivers to latest version and reboot the system. Later connect NVMe and install RAID driver on the NVMe devices.***

**Before you begin...**

**Have the Windows operating system installation media available and ready to install.**

## **2 BOOTABLE ARRAYS**

**NOTE:** *Windows : Removeable storage (Flash Driver) required for Copying AMD-RAID drivers*

### **2.1 Copy AMD-RAID drivers to a removeable storage medium: Windows**

A removable storage medium is needed when the OS is installed to an **AMD-RAID** bootable array.

1. Power-on the system.
2. Locate and use a system that is running a Windows operating system and has a CD DVD drive or an I/O port for removable storage media (such as a USB flash drive).
3. Go to a browser and access the web site of your system supplier or motherboard vendor.
4. Insert the storage medium into the system:  
Windows 10 : Connect a USB flash drive to a USB I/O port, or insert a blank CD-DVD disk into the applicable drive.
5. Download the **AMD-RAID** drivers from the web site to the appropriate removable storage medium.
6. Proceed to Windows: Install AMD-RAID drivers during a Windows OS installation.

## 3 Pre-Installation Steps

**NOTE:** The steps mentioned here are specific to **AMD NDA BIOS** based off the **AMI BIOS**. The steps for Other BIOS Vendors will be different.

### 3.1 Platform BIOS Settings - Enable RAID

1. Power-on the system.
2. Press **ESC** to get into the Platform BIOS
3. Set or configure **Advanced -> AMD PBS -> NVMe RAID Mode=Enabled**
4. Set or configure **Advanced -> AMD CBS -> FCH Common Options -> SATA Configuration Options -> SATA Controller to Enabled.**
5. Set or configure **Advanced -> AMD CBS -> FCH Common Options -> SATA Configuration Options -> SATA Mode to RAID.**
6. Set or configure the **Advanced -> Promontory Common Options -> PT SATA Configuration Options -> PT SATA Port Enable to Enabled.**
7. Set or configure the **Advanced -> Promontory Common Options -> PT SATA Configuration Options -> PT SATA Mode to RAID.**
8. Set or configure the **Advanced -> CSM Configuration -> CSM Support -> Enabled**
9. Set or configure the **Advanced -> CSM Configuration -> Boot Option Filter to UEFI and Legacy or UEFI Only.**
10. Set or configure the **Advanced -> CSM Configuration -> Storage -> UEFI**
11. Save and reboot.

## 4 Create the Bootable Virtual Disk

### 4.1 RAIDXpert2 Configuration Utility (HII Mode)

1. Power-on the system.
2. Press **ESC** to get into the Platform BIOS
3. Select **Advanced, RAIDXpert2 Configuration Utility**, then press **Enter**
4. At the **RAIDXpert2 Configuration Utility's Main Menu**, use the **arrow keys** to select **Array Management**, then press **Enter**
5. Use the **arrow keys** to select **Create Array**, then press **Enter**
6. Select **Select RAID Level**, then press **Enter**
  - a. From the **Select RAID Level** drop down menu, use the **arrow keys** to select the desired RAID level, then press **Enter**
7. Select the disks with which to create the array:
  - a. Use the **arrow keys** to select **Select Physical Disks**, then press **Enter**
  - b. To select individual disks, **highlight** a disk with the **arrow keys** and press the **Space Bar** or **Enter**. Any number of disks may be selected using this method
  - c. To select all disks, use the **arrow keys** to select **Check All**, then press **Enter**
  - d. Use the **arrow keys** to select **Apply Changes**, then press **Enter**
8. Select an array size by doing the following:

- a. Use the **arrow key** to select **Array Size**, then press **Enter**
  - b. The Array size will default to the Maximum size allowed by the number of physical disks and RAID level selected. If you want a smaller size Array size, enter the desired value.
  - c. Press **Enter** when the desired size is reached.
9. Using the **arrow keys** to select **Read Cache Policy**, then press **Enter**
    - a. Select the desired **Read Cache Policy**, then press **Enter**
  10. Using the **arrow keys** to select **Write Cache Policy**, then press **Enter**
    - a. Select the desired **Write Cache Policy**, then press **Enter**
  11. Use the **arrow keys** to select **Create Array**, then press **Enter**

## 4.2 UEFI Mode

1. At the system's Power-On Self-Test (POST) screen, press F7 / F12 / ESC (or similar) to access the UEFI Configuration Utility (aka UEFI Boot Manager).
2. Boot to the EFI Internal shell

**Note:** obtain the `rcadm.efi` file from your system supplier or motherboard vendor and copy it onto a UEFI flash drive, in the root directory.

3. Enter `fsx:` where x is the number of the UEFI Flash Drive.
4. Use `rcadm` to create the desired Boot Virtual Disk.

### Examples:

**Note:** the user may have to press the page up key to see more of the information.

- a. To Query the devices connected in the system: (Output will display the UEFI version, physical devices and arrays)  
`rcadm.efi -M -qa`
- b. Create a Volume on disk 1 with a size of 80 Gbs and disables Read/Write Cache:  
`rcadm.efi -C -v -d 1 -s 80000 -ca nc`
- c. Create a RAID0 on disks 1, 2 with a size of 100 Gbs and enables Read Cache:  
`rcadm.efi -C -r0 -d 1 2 -s 100000 -ca r`
- d. Create a RAID1 on disks 2, 3 with a max size available and enables Read/Write Cache:  
`rcadm.efi -C -r1 -d 2 3 -ca rw`
- e. Create a RAID10 on disks 1, 2, 3, 4 with a size of 125 Gbs and enables Write Cache:  
`rcadm.efi -C -r10 -d 1 2 3 4 -s 125000 -ca w`

## 5 Install AMD-RAID Drivers

### 5.1 Windows: Install AMD-RAID UEFI drivers during Windows OS installation

Install the AMD-RAID UEFI drivers during Windows 10 OS Installation

**NOTE:** *The windows described in this guide are typical. Path names and text can vary, depending on user-designated selections and other parameters.*

**NOTE:** *NVMe devices will be listed in the “Where do you want to install Windows?”, do not delete any of the partitions or format the NVMe devices. Doing so will delete the **AMD-RAID** metadata and the desired RAID level will be deleted. Once the **AMD-RAID** drivers (*rcbottom* and *rcraid*) have been loaded, a valid **AMD-RAID** Virtual Disk will appear.*

1. Power-on the system.
1. Create a bootable array, see Section 3.
2. Insert the Microsoft Windows operating system CD-ROM or DVD into the system’s CD or DVD drive.
3. Boot the system and allow it to access the Microsoft Windows operating system CD-ROM or DVD.
4. At the Windows setup window:
  - Select the language, time and keyboard options
  - Click **Next**
  - Click **Install Now** or similar
  - If prompted, select the desired Operating System
  - Click **Next**
  - Insert the storage medium with the **AMD-RAID** drivers into the USB port or applicable system drive.
  - Click **Browse**
  - Navigate to the directory containing the saved **AMD-RAID** drivers
  - Click **OK**

**NOTE:** *If the installation has multiple controllers, there will be two or more *rcbottom.inf*’s listed.*

- Select the first **AMD-RAID Bottom Device (rcbottom.inf)** driver in the list
  - Click **Next**
5. At the Load Driver Warning message
    - Click **OK**
  6. At the Select the Driver to install window
    - Click **Browse**
    - Navigate to the directory containing the saved **AMD-RAID** drivers
    - Click **OK**
    - Select the **AMD-RAID Controller (rcraid.inf)** driver in the list
    - Click **Next**
    - Select (Check Mark) **I Accept the License Terms**
    - Click **Next**
    - Select **Custom: Install Windows Only (advanced)** or similar
  7. Once both drivers have been loaded, a valid Virtual Disk appears:
    - Click **Load Drivers**
    - Click **Browse**

- Navigate to the directory containing the saved **AMD-RAID** drivers
  - Click **OK**
  - Select the **rccfg.inf** driver in the list
  - Click **Next**
8. At the Where do you want to install Windows
    - Click **Next**
  9. Follow the on-screen instructions to complete the installation of the applicable Windows operating system.
  10. After the OS is installed, Open Device Manager and verify the following:
    - Expand Storage Controllers: there will be an entry(ies) listed as **AMD-RAID Bottom Device**
    - Expand Storage Controllers: there will be an entry(ies) listed as **AMD-RAID Controller**
    - Expand System Devices: there will be an entry(ies) listed as **AMD-RAID Config Device**
  11. Remove the storage medium and Microsoft Windows OS CD-ROM or DVD from the applicable drive(s) or port, proceed to the Windows: Install the AMD RAIDXpert2 Management Suite

## 6 Install the AMD-RAIDXpert2 Management Suite and Web GUI

### 6.1 Windows – AMD-RAIDXpert2 Management Suite

Obtain the latest Catalyst executable file from your system supplier or motherboard vendor. Download the file to the system's desktop, execute it and follow the on-screen prompts.

#### 6.1.1 Windows – AMD RAIDXpert2 Management Suite Installation (Manually)

1. Obtain the AMD RAIDXpert2 Management Suite executable file (Setup.exe) from your system supplier or motherboard vendor. Download Setup.exe to the system's desktop.
2. Install AMD RAIDXpert2 (setup.exe) by typing:
  - Open a command prompt, must be run as Administrator
  - `cd C:\User\User_Name\Desktop`
  - `Setup.exe -i silent`

**NOTE:** for the Web GUI to function correctly, `rc_cgi` and `apache` must be running.

3. Turn off Windows Firewall (or unblock during step 2).
4. Click on the RAIDXpert2 Desktop Icon

Default credentials are:

- Username – admin
- Password – admin

Change the credentials:

- Create new username
- Create new password

5. Re-log into the system with the new credentials.