## Contents

Revision History ....................................................................................................................... 5  
Chapter 1 General Information .................................................................................................. 6  
  1.1 Purpose ............................................................................................................................... 6  
  1.2 System Requirements ........................................................................................................ 6  
  1.3 Generic System Setup ....................................................................................................... 7  
Chapter 2 BOOTABLE ARRAYS .............................................................................................. 8  
  2.1 Copy AMD-RAID Drivers to a Removable Storage Medium: Windows® ......................... 8  
Chapter 3 Pre-Installation Steps ............................................................................................. 9  
  3.1 Platform BIOS Settings - Enable RAID for the AMD SP3-Series Chipsets ....................... 9  
  3.2 Platform BIOS Settings – Enable RAID for the AMD Socket AM4-Compatible Processors .............................................................................................................. 10  
Chapter 4 Create the Bootable Virtual Disk .......................................................................... 12  
  4.1 RAIDXpert2 Configuration Utility (HII Mode) For the AMD Ryzen™ Threadripper™ Processor .................................................................................................................. 12  
  4.2 RAIDXpert2 Configuration Utility (HII Mode) For the AMD Ryzen™ Desktop Processor ......................................................................................................................... 13  
  4.3 UEFI Mode ........................................................................................................................ 14  
Chapter 5 Install AMD-RAID Drivers ..................................................................................... 15  
  5.1 Windows®: Install AMD-RAID UEFI Drivers during Windows® OS Installation .......... 15  
Chapter 6 Install the AMD-RAIDXpert2 Management Suite and Web GUI ..................... 17  
  6.1 Windows® – AMD-RAIDXpert2 Management Suite ...................................................... 17  
  6.1.1 Windows® – AMD-RAIDXpert2 Management Suite .................................................. 17  
  6.1.2 Windows® – AMD RAIDXpert2 Management Suite Installation (Manually) .......... 17  

## List of Tables

Table 1. System Requirements .................................................................................................. 6  
Table 2. Information about Supported Configuration by Installer ......................................... 7
### Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2018</td>
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Chapter 1  General Information

1.1  Purpose

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

- Copy AMD RAID device drivers to removable storage media for the following operating systems:
  - Microsoft® Windows 10 x64
- Load AMD RAID device drivers on a system at the time during Windows operating system installation.
- Install the AMD-RAIDXpert2 (Web GUI) for RAID array management

1.2  System Requirements

Table 1. System Requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirements</th>
</tr>
</thead>
</table>
| 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 (Two controllers with Device ID 0x7917, one controller with device ID 0x43BD and NVMe (one controller per NVMe)  
11 (One controller with Device ID 0x7916, one controller with device ID 0x43BD and NVMe (one controller per NVMe) |
| Supported AMD Controllers      | AMD SP3-Series Chipsets  
AMD AM4-Series Chipsets                                                      |
| Systems used for testing       | AMD Family 17h Model 01h Rev B1, SP3 processor based platform code-named “Whitehaven”  
AMD Family 17h Model 01h Rev B2, AM4 processor based platform code-named “Myrtle”.  
AMD Family 17h Models 10h-1Fh, AM4 processor based platform code-named “Myrtle”  
AMD Family 15h Models 60h-6Fh, AM4 processor based platform code-named “Myrtle” |
Maximum Supported Controllers:
- Eight NVMe controllers + two SoC controllers + one PT controller when all set to RAID in BIOS

1.3 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. RAID Mode shall be enabled on the system after Configuring BIOS settings as mentioned in Section 3.1.
   b. This enables the loading of the AMD-RAID UEFI driver
4. Initialize the disks, using the RAIDXpert2 Configuration Utility (HII) or UEFI shell.
5. Create arrays, using the HII Configuration Utility or UEFI shell. *(Refer to Section 4.1)*
6. Load the AMD-RAID drivers during the 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 or download driver software form vendor support page.
Chapter 2  

**BOOTABLE ARRAYS**

*Note: Before beginning, Have the Windows® operating system installation media available and ready to install.*

*Note: Windows: Removable storage (Flash Drive) required for Copying AMD-RAID drivers*

### 2.1 Copy AMD-RAID Drivers to a Removable Storage Medium: Windows®

A removable storage medium is needed to copy AMD RAID drivers required for OS installation onto 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. 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.
4. Go to a browser and access the web site of your system supplier or motherboard vendor.
5. Download the AMD-RAID drivers from the web site to the appropriate removable storage medium.
6. Proceed to Windows Install and load AMD-RAID drivers during a Windows OS installation.
Chapter 3 Pre-Installation Steps

3.1 Platform BIOS Settings - Enable RAID for the AMD SP3-Series Chipsets

*Note: The steps to configure a system to RAID mentioned here are specific to AMD NDA BIOS based off the AMI BIOS.*

1. Power-on the system.
2. Press **Delete** or **ESC** to get into the Platform BIOS setup page.
3. In the BIOS setup:
   a. Select the **Advanced** tab, then press **Enter**
   b. Select the **AMD PBS** tab, then press **Enter**
   c. Set NVMe RAID Mode to **Enabled**
4. In the BIOS setup:
   a. Select the **Advanced** tab, then press **Enter**
   b. Select the **AMD CBS** tab, then press **Enter**
   c. Select FCH Common Options, then press **Enter**
   d. Select SATA Configuration Options, then press **Enter**
   e. Set SATA Controller to **Enabled**.
5. In the BIOS setup:
   a. Select the **Advanced** tab, then press **Enter**
   b. Select the **AMD CBS** tab, then press **Enter**
   c. Select FCH Common Options, then press **Enter**
   d. Select SATA Configuration Options, then press **Enter**
   e. Set SATA Mode to RAID.
6. In the BIOS setup:
   a. Select the **Advanced** tab, then press **Enter**
   b. Select Promontory Common Options, then press **Enter**
   c. Select PT SATA Configuration Options, then press **Enter**
   d. Set PT SATA Port Enable to **Enabled**.
7. In the BIOS setup:
   a. Select the **Advanced** tab, then press **Enter**
   b. Select Promontory Common Options, then press **Enter**
   c. Select PT SATA Configuration Options, then press **Enter**
   d. Set PT SATA Mode to RAID.
8. In the BIOS setup:
a. Select the Advanced tab, then press Enter  
b. Select CSM Configuration, then press Enter  
c. Set CSM Support to Enabled  

9. In the BIOS setup:  
a. Select the Advanced tab, then press Enter  
b. Select CSM Configuration, then press Enter  
c. Set Boot Option Filter to UEFI and Legacy or UEFI Only.  

10. In the BIOS setup:  
a. Select the Advanced tab, then press Enter  
b. Select CSM Configuration, then press Enter  
c. Set Storage -> UEFI  

11. Save (F4) the setting and restart the system.

3.2 Platform BIOS Settings – Enable RAID for the AMD Socket AM4-Compatible Processors

Note: The steps to configure a system to RAID mentioned here are specific to AMD NDA BIOS based off the Insyde BIOS.

1. Power-on the system  
2. Press ESC to enter the System BIOS setup page  
3. Select Setup Utility, then press Enter  
4. In the BIOS setup:  
a. Select the Advanced tab  
b. Select IDE Configuration, then press Enter  
c. Set SATA Configure as to RAID, then press Enter  
d. Set Force RAID Mode to Enabled, then press Enter  
5. In the BIOS setup:  
a. Select the Boot tab  
b. Set Boot Type to UEFI Boot Type, then press Enter  
c. Set EFI Device First to Enable, then press Enter  
6. In the BIOS setup:  
a. Select the AMD-PBS tab  
b. Set NVME RAID Mode to Enabled, then press Enter  
7. In the BIOS setup:  
a. Select the AMD-CBS tab  
b. Select FCH Common Options, then press Enter  
c. Select SATA Configuration Options, then press Enter  
d. Set SATA Controller to Enabled, then press Enter
e. Set SATA Mode to RAID, then press Enter

8. In the BIOS setup:
   a. Select the AMD-CBS tab
   b. Select Promontory Common Options, then press Enter
   c. Select PT SATA Configuration Options, then press Enter
   d. Set PT SATA Port Enable to Enabled, then press Enter
   e. Set PT SATA Mode to RAID, then press Enter

9. Save and restart.
Chapter 4  
Create the Bootable Virtual Disk

4.1  
RAIDXpert2 Configuration Utility (HII Mode) For the AMD Ryzen™ Threadripper™ Processor

Note: The steps to configure arrays in RAID mode mentioned here are specific to AMD NDA BIOS and are based off AMI BIOS.

1. Power-on the system.
   a. Press ESC or DEL to get into the Platform BIOS
   b. Select the Advanced tab
   c. Select RAIDXpert2 Configuration Utility, then press Enter

2. At the RAIDXpert2 Configuration Utility’s Main Menu, use the arrow keys to select Array Management, then press Enter

3. Use the arrow keys to select Create Array, then press Enter

4. 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

5. 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

6. Select an array size by doing the following:
   a. Use the arrow keys 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.

7. Use the arrow keys to select Cache Tag Size
   a. Any Array with only HDD/SSD will have default CTS of 64 k
   b. Any Array with only NVMe or NVMe with HDD/SSD will have default CTS of 256 k

8. Using the arrow keys to select Read Cache Policy, then press Enter
   a. Select the desired Read Cache Policy, then press Enter

9. Using the arrow keys to select Write Cache Policy, then press Enter
   a. Select the desired Write Cache Policy, then press Enter
   b. Use the arrow keys to select Create Array, then press Enter
10. After completion of array creation save and reboot the BIOS

4.2 RAIDXpert2 Configuration Utility (HII Mode) For the AMD Ryzen™ Desktop Processor

*Note: The steps to configure arrays in RAID mode mentioned here are specific to AMD NDA BIOS based off Insyde BIOS.*

1. Power-on the system.
   a. Press ESC to get into the Platform BIOS
   b. Select Device Management, then press Enter
   c. Select RAIDXpert2 Configuration Utility, then press Enter
2. At the RAIDXpert2 Configuration Utility’s Main Menu, use the *arrow keys* to select Array Management, then press Enter
3. Use the *arrow keys* to select Create Array, then press Enter
4. Select Select RAID Level, then press Enter
   From the Select RAID Level drop down menu, use the *arrow keys* to select the desired RAID level, then press Enter
5. Select the disks with which to create the array:
   Use the *arrow keys* to select Select Physical Disks, then press Enter
   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
   To select all disks, use the *arrow keys* to select Check All, then press Enter
   Use the *arrow keys* to select Apply Changes, then press Enter
6. Select an array size by doing the following:
   Use the *arrow keys* to select Array Size, then press Enter
   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. Press Enter when the desired size is reached.
7. Use the arrow keys to select Cache Tag Size
   a. Any Array with only HDD/SSD will have default CTS of 64 k
   b. Any Array with only NVMe or NVMe with HDD/SSD will have default CTS of 256 k
8. Using the *arrow keys* to select Read Cache Policy, then press Enter
   Select the desired Read Cache Policy, then press Enter
9. Using the *arrow keys* to select Write Cache Policy, then press Enter
   Select the desired Write Cache Policy, then press Enter
10. Use the *arrow keys* to select Create Array, then press Enter
11. After completion of array creation save and reboot the BIOS
4.3 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 rcdm.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 rcdm 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. Query the devices connected in the system: (Output will display the UEFI Version, physical devices and arrays)
   ```
   rcdm.efi -M -qa
   ```
   b. Create a Volume on disk 1 with a size of 80 Gbs and disables Read/Write Cache:
   ```
   rcdm.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:
   ```
   rcdm.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:
   ```
   rcdm.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:
   ```
   rcdm.efi -C -r10 -d 1 2 3 4 -s 125000 -ca w
   ```
Chapter 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. Create a bootable array, see Chapter 4.
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 **AMD-RAID Config Device (rcfg.inf)** driver from 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 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.

Chapter 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

1. Obtain the latest Catalyst executable file from your system supplier or motherboard vendor.
2. Download the file to the system’s desktop, execute it and follow the on-screen prompts.
3. Click on the RAIDXpert2 Desktop Icon
4. Select the applicable language from the drop-down menu (defaults on English)
5. Default credentials are:
   • Username – admin
   • Password – admin
6. Change the credentials:
   • Create new username
   • Create new password
7. Re-log into the system with the new credentials.

6.1.2  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:
   • Open a command prompt, must be run as Administrator
   • cd C:\User\User_Name\Desktop
   • For silent installation: setup.exe
   • For GUI installation: setup.exe -i gui

   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 AMD RAIDXpert2 Management Suite or Web GUI with the new credentials.