AMD RAID Installation Guide

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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

- 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 Installing Windows[®] OS With RAID Functions

If you want to install Windows[®] 7 / 7 64-bit / 8 / 8 64-bit / 8.1 / 8.1 64-bit / 10 64-bit on a RAID disk composed of 2 or

more SATA HDDs with RAID functions, please follow below procedures according to the OS you install.

1.3.1 RAID Functions for AMD A85X, A75, A55 chipsets

<u>Way 1</u>:

Use legacy RAID ROM to create and configure the RAID disk. The RAID disk will be created in MBR mode which the size of the RAID disk is limited to 2TB. For RAID disk size larger than 2TB, please refer to **Way 2** (UEFI Mode for GPT partition).

STEP 1: Set up UEFI

- A. During system boot, press <F2> or key to enter UEFI setup utility.
- B. Go to Advanced \rightarrow Storage Configuration.
- C. Set the "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+F> to enter legacy RAID ROM utility.
- B. Follow the instruction inside the RAID ROM utility to create the target RAID disk.

(Please refer to Section 1.4 in this guide for more details)

STEP 3: Copy RAID driver to a USB flash drive

- A. Please install the DVD-ROM into one of the SATA ports 5 ~ 8 which support IDE Combined Mode.
- 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 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 7/8/8.1).
- D. After RAID driver is loaded, the RAID disk will show up.
- E. Please follow Windows installation instruction to finish the process.

Way 2: (for Windows[®] 8 64-bit / 8.1 64-bit / 10 64-bit only)

Create and configure the RAID disk in GPT mode to support RAID disk size over 2TB and speed up system boot time.

STEP 1: Set up UEFI

- A. Enter UEFI SETUP UTILITY \rightarrow Advanced screen \rightarrow Storage Configuration.
- B. Set the "SATA Mode" option to <RAID>.
- C. Set the "Onboard RAID 3TB+ Unlocker" option to <UEFI Mode For GPT Partition >.



- D. Click <F10> to save and exit.
- E. Click <F11> to enter boot menu and select "Built-in EFI shell".



F. At the Shell> prompt, enter the command "drvcfg" and click <Enter>.



G. When the following screen appears, enter "dh <Drv number>" and click <Enter>.

Shell> dh 6B	
Handle 68 (9F8D8598)	
Image (9F8DAA40)	File:RaidX64
ParentHandle:	A1873F18
SystemTable:	AE122F18
DeviceHandle:	A1868998
FilePath	FvFile(c468b382-4550-4909-ad57-2496141b3f4a)
PdbFileName:	E:\UEFI1.0.0.42\Temp\EDK1\EDK106\Sample\Platform\X64\uefi\X64\RaidX64.pdb
ImageBase:	A1CD9000 - A1D131A0
ImageSize:	3A1A0
CodeType:	BS_code
DataType:	BS_data
ImageDpath (9F8DB	218)
Hardware Devic	e Path for Memory Mapped
Memory Type (11: AE4BF004-AF02E003)
	the for RTHC EV
AsStr: 'Memory	ath tor Find FV Mapped(0xb,0xae4bf004,0xaf02e003)/FvFile(c468b382-4550-4909-ad57-2496141b3f4a)

H. Enter "drvcfg(space)-s(space)<Drv number>(space)<Ctrl number>" and click <Enter> to access RAID Utility.

Configuration2 (A1D001E0)

Shell> drvcfg -s 68 10C_

I. Enter <Logical Drive Main Menu> to set up RAID Drive.



J. Choose <Logical Drive Create Menu> to create a RAID Drive.



K. Choose <Usable Physical Drive List> and select the hard drives to be included in the RAID array.

Click <Space> on keyboard to toggle checkbox. Then choose <Basic Setting>.



L. Enter <Ld Name>.

Choose <Ld Size setting> and set <LD Size (GB)> to LD Max Size.

Choose <Start To Create> and click <Enter> on keyboard to create logical drive.

+ Logical Drive Crea	te Menu	
- Raid Mode	1	<raid 0=""></raid>
- Stripe Block (KB)	:	<64>
- Setcor Size (Byte	s):	<512>
- Initialization	:	<fast></fast>
- Gigabyte Boundary	:	<disable></disable>
- Read Policy	:	<read ahea<="" td=""></read>
- Write Policy	:	<write bac<="" td=""></write>
- Ld Name	:	asrock
+ Ld Size Setting		
- Ld Max Size	: 6001.18 GB	
- Ld Size (GB)	2	[6001]

M. Click <Enter> two times.



N. Click <Esc> to return to the previous page and choose <Logical Drive List Menu> to check the logical drive list. Press <F10> to save and exit.



O. Enter UEFI SETUP UTILITY → Boot to set the "Fast Boot" option to <Ultra Fast>. Press <F10> to save change and exit.



STEP 2: Windows[®] 8 64-bit / 8.1 64-bit / 10 64-bit OS installation

Click <F11> to enter boot menu and select "UEFI" DVD-ROM to install OS.



1.3.2 RAID Functions for AMD X370, B350, A320, A88X, A78, A68H, A58 chipsets

<u>Way 1</u>:

Use legacy RAID ROM to create and configure the RAID disk. The RAID disk will be created in MBR mode which the size of the RAID disk is limited to 2TB. For RAID disk size larger than 2TB, please refer to **Way 2** (UEFI Mode for GPT partition).

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 "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. Follow the instruction inside the RAID ROM utility to create the target RAID disk.(Please refer to Section 1.4 in this guide for more details)

STEP 3: Copy RAID driver to a USB flash drive

A. Please install the DVD-ROM into one of the SATA ports 5 ~ 8 which support IDE Combined Mode.

*Due to the AMD A68H chipset limitation, please install the DVD-ROM into one of the SATA ports 1 ~ 4 and set the

"SATA Mode" option to <AHCI> in BIOS setup. After copying RAID driver to a USB flash drive, please set the "SATA

Mode" option back to <RAID> in BIOS setup.

- 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 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 7/8/8.1/10).
- D. After RAID driver is loaded, the RAID disk will show up.
- E. Please follow Windows installation instruction to finish the process.

Way 2: (for Windows[®] 8 64-bit / 8.1 64-bit / 10 64-bit only)

Create and configure the RAID disk in GPT mode to support RAID disk size over 2TB and speed up system boot time.

STEP 1: Set up UEFI

- A. Enter UEFI SETUP UTILITY \rightarrow Advanced screen \rightarrow Storage Configuration.
- B. Set the "SATA Mode" option to <RAID>.
- C. Set the "Onboard RAID 3TB+ Unlocker" option to <UEFI Mode For GPT Partition >.



- D. Click <F10> to save and exit.
- E. Click <F11> to enter boot menu and select "Built-in EFI shell".



F. At the Shell> prompt, enter the command "rcadm -M -qa" and click <Enter> to show RAID information.

* Please refer to the step 3 of Section 1.3.2 to copy rcadm.efi file to USB flash disk or download the file from ASRock

website http://download.asrock.com/drivers/AMD/SATA/BoltonRAID(v6.1.0.00117).zip.

*See the Appendix section for more information on "rcadm.efi".

Press EBC in 5 seconds Bhell> rcada -H -ga	to skip startup.	nsh , any other key	i to continue.			
«VERSIONS»		The state of		and the second	12 6 14	
RAIDXpert2: 6.1.0-001	17				Disk	California.
CONTROLLER LIST>	Serial Number	License Key	Disk	State	Туре	
0 AHD-RAID 40	00040001022 HS4HH-	-7H2C1-H115H-17921				
Disk	Port	Port	A			
Disk State Type	Туре	Speed Siz	A DESCRIPTION OF THE OWNER.	0n11ne	Disk	SATA
0 Online Disk CAMZ0075143	SATA	30b/sec 3,	1	Online	Disk	SATA
1 Online Disk CANZ0076074	SATA	30b/sec 3,	C/IHZ0	076074		

G. When the following screen appears, enter "rcadm -M -id -d<list>" and click <Enter> to initialize disk.



H. Enter "rcadm -C <raid_type> -d <list>" and click <Enter> to create RAID disk.

RAID Types:

volume,	-v	Single disk or concatenation of disks (JBOD)
raidable,	-ra	Single disk, RAIDAble
raid0,	-r0	Stripe of two or more disks
raid1,	-r1	Mirror of two disks
raid10,	-r10	Stripe set of mirror sets
raid5,	-r5	Stripe set with parity, three to sixteen disks



 Enter UEFI SETUP UTILITY → Boot to set the "Fast Boot" option to <Ultra Fast>. Press <F10> to save change and exit.



STEP 2: Windows[®] 8 64-bit / 8.1 64-bit / 10 64-bit OS installation

Click <F11> to enter boot menu and select "UEFI" DVD-ROM to install OS.



1.4 Create Disk Array

Power on your system. If this is the first time you have booted with the disk drives installed, the AMD onboard RAID

Option ROM Utility will display the following screen.

	ption RCM Version DR Advanced Micro		. All rights reserved.	
(0) 25	ob Mayanced Micro	Devices: int	All lights leselves.	
10	MODE	LD SIZE	TRACK MAPPING	STATUS
Ū1	1x2 RAID 1	79.00G	9604/255/63	Functional
Port	Device Name			
3 4	WDC WD360GD-00FN Maxtor 6B300S0	CA3		
Press	<cirl-f> to enter</cirl-f>	BAID Cotion	ROM HEALING	

The RAID Option ROM includes a Utility with tools to set up your physical drives as RAID logical drives. The RAID

Option ROM Utility can perform these functions:

- Monitoring RAID status
- Viewing physical drive assignments
- Secure erasing of all data on physical drives
- Creating RAID logical drives
- Creating multiple logical drives using the same physical drives
- Deleting RAID logical drives
- Diagnosing critical and offline RAID logical drives
- Displaying the IRQ and base address (for system diagnosis)

1.4.1 Configuring RAID Option ROM For AMD A85X/A75/A55 Chipsets

During the POST process, press <Ctrl+F> keys, then the RAID Option ROM Utility Main Menu appears.



Press 2 on the Main Menu screen to display the Define LD Menu. Press <Ctrl+C> to create a RAID array.



Press the arrow keys to highlight an option. Press the spacebar to cycle through logical drive types, including RAID 0,

Stripe	e Boundary	NA		RAID 1 0 Initialization Sector Size Write Policy	512 B
Port:ID 01:01 02:01	Drive Model WD20EARX-22	E Dr PASBØ	ives Assignm		B) Assignment 39 N
10.20	WP20ERAG-62	FHSDO	3010 00	2000.	

RAID 1, RAID 5 and RAID 10.

WARNING!!

While you are allowed to use any available RAID level for your bootable logical drive, it is recommended to use RAID 1 for most applications.

Press the arrow key to move to Disk Assignments. Press the spacebar to toggle between N and Y for each available drive. Y means this disk drive will be assigned to the logical drive. Assign the appropriate number of disk drives to your logical drive. Then press <Ctrl-Y> to save your logical drive configuration.

Port:ID	Drive Model	Capabilities	Capacity(GB)	Assignment
01:01	WD20EARX-22PASB0	SATA 6G	2000.39	Y
02:01	WD20EARX-22PASB0	SATA 6G	2000.39	Y

Press <Ctrl-Y> to input the LD Name.

Port : ID 01 : 01		Drives Assignments Capabilities SATA 6G	Capacity(CB) 2000.39	Assignment Y
^{02 :0}	Enter the LD name h	ere: ASRock-RAID1		×

Press Ctrl-Y to Modify Array Capacity or press any other key to use maximum capacity...

Choose one of the following actions:

- 1. Use the full capacity of the disk drives for a single logical drive: Please read "One Logical Drive" below.
- 2. Split the disk drives among two logical drives: Please read "Two Logical Drives" below.

One Logical Drive

After selecting the logical drive in Disk Assignments as the above-mentioned procedures, press any key (except for <Ctrl-Y>) to use the full portion of the logical drive for one logical drive. Then please follow the steps below:

- 1. Press <Esc> to exit to the Main Menu.
- 2. Press <Esc> again to exit the Utility.
- 3. Press <Y> to restart your computer.

You have successfully created a new RAID logical drive. Please install the operating system to your computer by following the detailed instruction of the "User Manual" in our support CD.

Two Logical Drives

After selecting the logical drive in Disk Assignments as the above-mentioned procedures, press <Ctrl-Y> to allocate a portion of the disk drives to the first logical drive. Then please follow the steps below.

LD No LD Name	ve 1	RAID Mode Drv	Capacity(CB)
LD 01 Logical Driv		RAID 1 2	2000.39
Stripe Block	NA	Initialization	
Cigabyte Boundary	ON	Sector Size	
Read Policy	Read Ahead	Write Policy	
Port:ID Drive Mode 01:01 WD20EARX-22 02:01 WD2 Enter		lities Capacity(G 6G 2000.	

1. Enter the desired capacity for the first logical drive and press < Enter>. The Define LD Menu displays again.

LD No	RAID Mode	Drv	Capacity(GB)	Status
LD 1	RAID 1	2	1999.99	Functional
	E 1	Keys Availab	te 1	

Intion ROM Utility (c) 2012 Advanced Micro Devices, Inc.

- 2. Press <Esc> to exit to the Main Menu. Press <Esc> again to exit the Utility.
- 3. Press <Y> to restart the computer.

You have successfully created a new RAID logical drive. Please install the operating system to your computer by

following the detailed instruction of the "User Manual" in our support CD.

1.4.2 Configuring Legacy RAID ROM For AMD X370/B350/A320/A88X/A78/A68H/A58

Chipset

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.

	0-00,2.0TB,Ready 1-01,2.0TB,Ready
Main Menu Initialize Disk(s) <u>Create Array</u> Belete Array(s)	
Manage Hot Spare(s) Manage Hot Spare(s) View Disk Details View Array Details Rescan All Channels	
Controller Options Continue to Boot License Level: 58	Available Keys <t><i><i><i><i><i><i><i><i><i><i><i><i><i></i></i></i></i></i></i></i></i></i></i></i></i></i></t>

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 Confi 6595FE235EEFBC7 SATA RW 1.9TB W Arrays	guration (Build: 6.1.0-00118) DC WD20EARX-22PASB WD-WCA2A6752732 Disks
	9-001,2.411B.Ready 1-01,2.0TB,Ready
Disks: 0,1	
User Input	
	Available Keys <t><t><t><t><t><t><t>>= Data block (Esc>=Back <ins>=Select, <a>=All, <enter>=Done</enter></ins></t></t></t></t></t></t></t>

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

	ration (Build: 6.1.0-00118) lata on each of two disks for protection Disks
n rayo	0-00,2.0TB,Ready 1-01,2.0TB,Ready
Disks: 0,1 Type: RAID1	
User Input Select Array Type to Create RAIDS RAIDIGN RAIDO RAIDIN	
RAIDI Volume RAIDIO RAIDABLE RAIDSO	Available Keys <t><t><t><t><t><t><t><t><t><t><t><t><t><</t></t></t></t></t></t></t></t></t></t></t></t></t>

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

	ation (Build: 6.1.0-00118)
Arrays	Disks 0-00,2.0TB,Ready 1-01,2.0TB,Ready
Create Array Disks: 0,1 Type: RAIDO Total Size: 2.1TB	
Choose Size to Make Array	
Size Chosen: 2TB Limit DOS Size: 1.9TB Exactly: 2.199.000.000.000	Available Keys <pageup><t><pagedowa><i>=Change Size <enter>=Complete, <esc>=Go Back</esc></enter></i></pagedowa></t></pageup>

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

Read and Write-back Caching. (So	iguration (Build: 6.1.0-00118) me data may be lost in a crash) Disks
Arrays —	0-00,2.0TB,Ready 1-01,2.0TB,Ready
Create Array Disks: 0,1 Type: RAIDO Total Size: 3.9TB	
Caching Mode: Read/Write User Input Select Caching Mode	
<mark>Read/Write</mark> Read Only None	Available Keys <t><t><+>=Choose, <esc>=Back <enter>=Select Menu Item</enter></esc></t></t>

 $\label{eq:Press} $$ <\!C\!\! > to confirm and then press <\!Esc\!\! > to return to the previous screen. $$$

	iguration (Build: 6.1.0-00118)
Arrays —	Disks 0-00,2.0TB,Ready 1-01,2.0TB,Ready
Disks: 0,1 Type: RAIDO Total Size: 3.9TB	
Caching Mode: Read/Akrite	
Confirm Creation of Array	Available Keys <

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

Arrays 1RAIDO, 3.9TB, Normal(R/W)	8-80,2.8TB,Online 1-81,2.8TB,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 Controllon Spatians	
Controller Options Continue to Boot License Level: 50	Available Keys <t><t><t>Constant of the second sec</t></t></t>

2. AMD Windows RAID Installation Guide

AMD Windows RAID Installation Guide is an instruction for you to configure RAID functions by using RAIDXpert RAID management software under Windows environment. The RAIDXpert software offers local and remote management and monitoring of all AMD SATA logical drives that exist anywhere on a network. Its browser-based GUI provides email notification of all major events/alarms, memory cache management, drive event logging, logical drive maintenance, rebuild, and access to all components in the RAID configuration (server, controller, logical drives, physical drives, and enclosure). RAIDXpert is designed to work with AMD SATA RAID controllers. Other brands of RAID controllers are not supported. Please read this guide carefully and follow the instructions below to configure and manage RAID functions.

2.1 Components of RAIDXpert Installation Software

RAIDXpert installation software will install two major components to your system:

- RAIDXpert RAID management software: The RAIDXpert software installs on the PC with the AMD SATA RAID Controller (the "Host PC").
- Java Runtime Environment (in a private folder): The RAIDXpert installation program installs a private JRE in folder _jvm under the same directory where RAIDXpert is installed. RAIDXpert uses this private JRE to avoid incompatibility issues with any other JREs that may be present on your system.

2.2 Browser Support

On the Host PC with the AMD Controller, where you install RAIDXpert, you must have one of the following browsers: Internet Explorer 6.0, Mozilla Suite 1.7, Mozilla Firefox 1.0, or Netscape Navigator 7.1.

If you do not have one of the above browsers, install the browser first and make it the default browser. Then install RAIDXpert. You must use one of the browsers listed above on your networked PC in order to access RAIDXpert over the network.

2.3 Installing RAIDXpert

Follow these steps to install RAIDXpert on your Windows-based PC or Server.

- 1. Boot the PC or server, launch Windows, and log in as the Administrator. If the computer is already running, exit all programs. If you are not logged in as the Administrator, log out, then log in again as the Administrator.
- 2. Insert the software CD into your CD-ROM drive.
- 3. Double-click the Install CD's icon to open it.
- 4. Double-click the Installer icon to launch it (right). The first RAIDXpert installation dialog box appears.
- 5. Follow the prompts in the installation dialog boxes.
- 6. When the first installation screen appears, choose an installer language from the dropdown menu.

Select the language for the insta	allation from the choice
English (United States)	
Chinese (Simplified) Chinese (Traditional) Czech Danish Dutch (Nethellands) Hinnish Franch (France) Geman (Gemany) Greck Hungarian Italian (Itay) Japanese Korean Norwegian (Bokmal) Polish Polish Polish Polish Spanish (Traditional Scri) Swedish Thai	2

7. When the Welcome screen appears, click the **Next** button.

RAIDXpert - InstallShield Wi	zard	X
	Welcome to the InstallShield Wizard for RAIDXpert	
	The InstallShield Wizard will instal RAIDMperi on your computer. To centinue, click Next.	
	Canc	el

 When the License Agreement screen appears, click the "I accept the terms of the license agreement" option to proceed with installation. Then click the Next button to continue.

Note:

If you leave the "I do not accept the terms of the license" option selected, the installation will quit when you click Next.

cense Agreement Please read the following ficense agreem	ent carefully.	
Ádvanced Micro Devices, Inc. Softwaie Liberse Agreement IMPORTANT - READ CAREFULLY: Dr read and agreed to the following forms a ("Agreement") between you (ether an inv Micro Devices, Inc. ("AMD"), Ir Licensee	nd conditions. This is a legal dividual or an entity) ("Licens a does not agree to the terms	agreement ee") and Advanced
that may include associated media, printe documentation or any portion thereof that	ed Software, and online or ele it is made available to downlo	ectronic ad from this server or
do not install or use this Software or any that may include associated media, print documentation or any portion thereof tha CD ROM ("Software"), Licensee agrees	ed Software, and online or ele it is made available to downlo	ectronic ad from this server or
that may include associated media, printe documentation or any portion thereof tha CD-ROM ("Software"), Licensee agrees	ed Software, and online or ele al is made available to downlo to all of the terms of this Agre	ectronic ad from this server or
that may include associated media, printe documentation or any portion thereof that	ed Software, and Chline of ele al is made available to downic to al of the terms of this Agre ement	ectronic ad from this server of ement

9. When the Choose Install Folder screen appears, make your selection of a folder for the RAIDXpert applications you are installing. For example, the Windows default folder is: C:\Program Files\AMD\RAIDXpert If you want a different folder, type its location or click the Choose... button and select a new location. Click the Next button when you are finished.

hoose Destination Location	Sec. 1
Select folder where setup will install files.	
Setup will install RAIDXpert in the following folder.	
To install to this folder, click Naxt. To install to a different fold another folder.	er, click Browse and select
Destination Folder	
Destination Folder C:\Program Files\AND\RAID\&pert\	Elower"
	Erowse

10. When the Check HTTP SSL screen appears, you can choose External Security. An explanation follows. External SSL Security – Applies security to all connections involving the Internet or outside your company firewall. Security options are invisible to authorized users. AMD provides a default certificate for the server as well as for internal data communication. However, in some cases it is better to install and verify your own certificate for the webserver. And, if possible, verify your certificate by certificate authority like Verisign or Thwate. See your MIS Administrator for guidance. Click the Next button when you have made your choice.

DXpert - InstallShield Wizard			
Check HTTP SSL			
RAIDXpert has the ability to be insta The setting can be changed at any Please read the HAIDXpert User's N	time		oit,
External Http Security			
-Million -			
alShiele	< <u>B</u> ack	Next 3 Car	

11. When the Ready to Install screen appears, click the **Install** button to continue.

Ready to Install the Program			Same a
The wizard is ready to begin installation.			1
Dick Install to begin the installation			
If you want to review or change any of your the wizard.	installation setling	e, olick Back. (Click Cancel to exit
ing means.			
al Shioc			

12. When the Install Complete screen appears, click the **Finish** button.

RAIDXpert - InstallShield Wia	zard
	InstallShield Wizard Complete Selup has finished installing RADXpeit on your computer.
	KEack Finsh Cencel

2.4 Logging into RAIDXpert

Choose RAIDXpert in the Windows Programs menu. Or, log on manually with your browser:

- 1. Launch the Browser.
- 2. In the Browser address field, type the entry explained below.

If you did not choose the External Security option during RAIDXpert installation, use the Regular connection.

If you chose the External Security option during RAIDXpert installation, use the Secure connection.

2.5 Regular Connection

RAIDXpert uses an HT	TP connection	http://

Together, your entry looks like this:

http://127.0.0.1:25902/ati or http://localhost:25902/ati

2.6 Secure Connection

RAIDXpert uses a secure HTTP connectionhttps://

Together, your entry looks like this:

https://127.0.0.1:8443/amd or https://localhost:8443/amd

Note that the IP address shown above applies to a log-in at the Host PC. When you log in over a network, enter the Host PC's actual IP address or hostname.

Press the **Enter** key. Then, when the login screen appears, type **admin** in the Login ID field. Type **admin** again in the Password field. The RAIDXpert login and password are case sensitive.



Click the **Sign in** button. After sign-in, the RAIDXpert opening screen appears.



2.7 Creating a New Logical Drive

A logical drive is a collection of physical drives in a RAID. To create a new logical drive:

- 1. Click Logical Drive View in Tree View.
- 2. Click the Create tab in Management View. The Select RAID Level screen appears.
- 3. Select the option beside the RAID level you want for your logical drive. RAIDXpert displays the RAID levels you can use with the available physical drives.



4. In the Select Drive Type screen, click the following option:

• Free Drives - Select all Free (unassigned) physical drives

The Select Drives screen appears.

Select Drive Group
Please select a free drive(s) or one logical drive that has free space
Selact one of the following groups:
© Free Drive(s)

- 5. Click the **Next** button.
- If you want to split the capacity of your physical drives between two logical drives, enter the capacity for the first logical drive in the Logical Drive Size field. Or, to use the maximum capacity of the physical drives, check the Use Maximum Capacity box.



7. Click the physical drives to select them. Available drives have a black frame. Selected drives have a red frame.

		striped over 3 or more drives, parity provides Sest overall balance of performance, capacity and
Logical Drive Size Please select at le		GB(Use Maximum Capacity) for RAID S.
Drive on Port	1 - 81.9 68	5
Free 61.89 GB		
E Drive on Port	2 - 81.9 68	
Free 81.89 GB		
Drive on Port	3 - 81.9 GB	
Free 61.89 GB		
Drive on Port	4 - 81.9 08	
Free 81.89 GB		
Selected Av	alable 🔽 Ass	igned 📒 Spare 📕 Invald

- 8. Click the **Next** button. The Assign a Name screen appears.
- 9. Enter a name for the logical drive in the field provided.



- 10. Click the **Next** button. The Final Settings screen appears.
- RAID 0, 5, and 10. Choose a Stripe Block Size from the dropdown menu. The choices are 64 and 128 KB. The Write Cache policy is None. You cannot change this setting.
- 12. RAID 0, 1, and 5. Select a Gigabyte Boundary policy from the dropdown menu.
 - **GigaByte Boundary** Rounds the size of the logical drive down to the nearest whole gigabyte. This is the default. For more information.
 - None No Boundary function.
- 13. Select an Initialization policy from the dropdown menu.
 - Fast Initialization Erases the reserve and master boot sectors of the physical drives being added to the logical drive.
 - Full Initialization Erases all sectors of the physical drives being added to the logical drive. RAID 0, 1 and 5 only.
 - None No initialization. This choice is not recommended.

Final Settings			
Lontirm your choices. M	ake any changes here.		
Name	Logical Lrive L		
RAID Level	RA10 F		
Logical Drive Size	Maximum Capacity		
Stripe Block Size	64 KB	-	
Write Eache	Write Through	-	
Gigabyte Boundary	Gigabyte Boundary	-	
Initialization	Fast Initialization	Ţ	
	(<< Prev) (fi	inish	

14. Click the **Finish** button. If there are physical drives available, the Select RAID Level screen appears again, where you can create an additional logical drive. Click the **Logical Drive** in Tree View to see all of the information about your new logical drive.

nformation Settings	Migration Synchronization million and an analysis in the second s							
🛛 Basic Information								
Assigned Name	Logical Drive 1							
RAID Level	RAID 5							
Capacity	50.00 GB							
status	Functional							
Background Activity	Ide							
🧉 Graphic View								
Drive on Part 1 - 81.9	16 GB							
Assigned LD 1-81 25.00 GB	700) 56.89.08							
Conversion Port 2 - 81.9	16 GB							
Assigned LD 1-02 25.00 GB	Free 56.89 GB							
Drive on Part 3 - 81.9	16 GB							
Assigned LD 1-03 25.00 GB	Free BX 09 GB							

Before you can use your new logical drive, you must partition and format the logical drive using your PC's operating system.

2.8 Connecting to RAIDXpert from the Internet

The above instructions cover connections between the Host PC and other PCs using RAIDXpert over your company network. It is also possible to connect to a Host PC from the Internet.

Your MIS Administrator can tell you how to access your network from outside the firewall. Once you are logged onto the network, you can access the Host PC using its IP address.

Please note that only the Host PC can read and write data to the logical drives. However, other PCs can monitor the Host PC from virtually any location.

2.9 Running RAIDXpert without Network Connection

While RAIDXpert was designed to run over a network, you can run RAIDXpert without a network connection but only from the Host PC. Follow this procedure:

- Choose RAIDXpert in the Windows Programs menu.Or choose RAIDXpert in the Linux Applications menu.Your browser opens and displays a "no connection to the Internet is currently available" message.
- 2. Click the Work Offline button.
- In the RAIDXpert login screen, enter your user name and password (if used), then click the Sign in button. A "webpage unavailable while offline" message will display.
- 4. Click the Connect button. A "no connection to the Internet is currently available" message will display.
- 5. Click the Try Again button.

After a few moments, RAIDXpert will display normally in your browser.

2.10 Using RAIDXpert2 to Create RAID Array in Windows (for AMD X370/B350/A320/A88X/A78/A68H/A58 Chipset)

1. When you install the all-in-one driver to your system from ASRock's support CD, AMD RAIDXpert2 will be auto-installed as well.

Customize	Install	No.		1
Welcome	Select Components to Install	en andere ander		
Analyze	Component Selection	Version	Size	*
Customize	 ✓ Microsoft Visual C++ 201 Microsoft Visual C++ 201 	10.0.3 10.0.3	9.0 MB 9.0 MB	
İnstall	AMD SMBus Driver AMD USB 3.0 Host Control AMD USB 3.0 Hub Driver	5.12.0 1.1.0.0 1.1.0.0	1.0 MB	
Finished	AMD AHCI compatible SAT AMD Steady Video Plug-In	6.1.0.0 2.06.0	1.0 MB	B
	MD RAIDXpert2	6.0.0.221		
	Select All Dese	2013.0	150.0 MB	Ŧ

2. Execute RAIDXpert2 in the Windows Programs menu.



3. When the login screen appears, type "admin" in the Login ID field. Type "admin" again in the Password field.

AMD RAIDXpert2 - Windows Internet Explorer		- • • × •
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👷 Favorites 🛛 🎪 🔊 Suggested Sites 🔹 🔊 Web Slice Gallery 🕶		
AMD RAIDXpert2	🚵 🖛 🗔 🐨 🖽 🗰 🕶 Page 🕶 Safety 🖛	Tools 🕶 🔞 🕶
🛞 Intranet settings are now turned off by default. Intranet settings are	e less secure than Internet settings. Click for options	×
	AMD RAIDXpert2 Management Tool Login Leaves Level 30 - AdDXpert2 Phe Usertanne: admin Password: English(ENU) I forgot my password Submit	
	🚭 Internet Protected Mode: On 🧳 👻	3 100% •

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

AMD RAIDXpert2 - Windows Internet Explorer	
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😪 Favorites 🛛 🚕 😰 Suggested Sites 🔹 😰 Web Slice Gallery 🔹	
AMD RAIDXpert2	🛐 🔹 🖾 👘 👻 Page 👻 Safety 👻 Tools 🕶 🚷
🛞 Intranet settings are now turned off by default. Intranet settings a	eless secure than Internet settings. Click for options
	Choose A New Username and Password. Username asrock (4 - 20 characters) Password ••••• (4 - 20 characters) Confirm New Password •••••
	Submit
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5. Be sure to delete the existing disk arrays before creating a new array.

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$\mbox{6.} \qquad \mbox{To create array, Click on Array} \rightarrow \mbox{Create}. \label{eq:create}$

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7. 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.

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8. Check if the array is created successfully.

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



Appendix –rcadm.efi information for AMD X370/B350/A320/A88X/A78/A68H/A58

rcadm -?

-?, --help

Displays all primary readm commands, or if used after an option, displays help for that specific option.

-log, --log-file

Print output to a log file as well as standard output. Requires a log file name argument. Overwrites existing file. Only one occurrence of this option on the command line is allowed.

Example: rcadm -M -qa -v -log status.txt

-C, --create

Command for creating arrays. Array types include linear (JBOD), volume (JBOD), RAID0, RAID1, RAID1n, RAID10, RAID10n, RAID5, RAID50, RAID6, RAID60, and RAIDAble. Some of the major functions include assigning spare disks; setting array size; setting the number of disks in each submember of a RAID10n or RAID50 array; and setting cache attributes.

-D, --delete

Command for deleting arrays. This mode does not have any optional arguments.

-M, --manage

Commands for managing and querying controllers, arrays, and disks. Some of the major functions include querying for information, adding and removing dedicated and global spare disks, setting cache attributes for arrays and disks, performing consistency checks on redundant array types, initializing disks, prioritizing tasks for arrays, scanning arrays and disks for changes in status, and hiding or unhiding arrays.

rcadm -M

MANAGE

-a, --array

Used with certain options to specify arrays.

-as, --add-spare

Adds a dedicated spare disk to an array. No space is reserved on the disk selected.

-rs, --remove-spare

Removes a dedicated spare disk from an array.

-ras, --remove-all-spares

Removes any spares from an array.

-ags, --add-global-spare

Adds a disk as a global spare. No space is reserved on the disk selected.

-rgs, --remove-global-spare

Removes a global spare disk.

-ca, --cache-array

Sets the cache attributes for an array. Cache attributes include read cache (r), read and write-back cache (rw), write-back cache (w), and no cache (nc).

-cd, --cache-disk

Sets the cache attributes for a disk. Cache attributes include read cache (r), read and write-back cache (rw), write-back cache(w), and no cache (nc).

-d, --disk

A required qualifier used with certain options to specify disks.

-h, --hide

Hides an array from the operating system.

-uh, --unhide

Unhides an array, making it visible to the operating system.

-id, --initialize-disk

Initializes a disk. If the disk is new and has not been used, you must initialize it before you can create arrays.

-n, --name

Identifies an array with a user-supplied name. The name can be up to 30 characters, but only 17 of those characters display in the BIOS.

-p, --priority

Sets an array's task priority from 1-10, with 10 being the highest priority.

-q, --query

Lists information about specific controllers, arrays, and disks.

-qa, --query-all

Lists information about controllers, arrays, and disks.

-v, --verbose

Modifier of the --query and --query-all option. Specifies more detail for arrays and disks.

-rsc, --rescan

Rescans the serial ATA (SATA) channels for new or removed disks.

-sa, --scan-array <on|off>

Specifies if background array scan scanning is on or off.

-sp, --smart-poll

Turns SMART polling on or off for the specified drive(s).

- -t, --task Used to pause, resume, and remove tasks.
- -ul, --unlink Unlinks two arrays linked through a create copy operation.

SYNTAX and EXAMPLES ADD SPARE --add-spare --array <list> --disk <list> -as -a <list> -d <list> Examples: rcadm --manage --add-spare --array * --disk 1 rcadm -M -as -a 1 2 -d 5 6 **REMOVE SPARE** --remove-spare --array <list> --disk <list> -rs -a <list> -d <list> Examples: rcadm --manage --remove-spare --array 5 --disk * rcadm -M -rs -a * -d 5 **REMOVE ALL SPARES** --remove-all-spares --array <list> -ras -a <list> Examples: rcadm --manage --remove-all-spares --array 5 rcadm -M -ras -a * ADD GLOBAL SPARE --add-global-spare --disk <list> -ags -d <list> Examples: rcadm --manage --add-global-spare --disk 1 2 3 rcadm -M -ags -d * REMOVE GLOBAL SPARE --remove-global-spare --disk <list> -rgs -d <list> Examples: rcadm --manage --remove-global-spare --disk * rcadm -M -rgs -d 5 CACHE SETTINGS FOR ARRAYS --cache-array <cache_attribute> --array <list> -ca <cache attribute> -a <list> Cache attributes: <r> for read cache <rw> for read and write-back cache <w> for write-back cache

<nc> for no cache Examples: rcadm --manage --cache-array rw --array * rcadm -M -ca nc -a 1 DISK SETTINGS (Advanced) Disk cache: --cache-disk <cache attribute> --disk <list> -cd <cache attribute> -d <list> Cache attributes: <r> for read cache <rw> for read and write-back cache <w> for write-back cache <nc> for no cache Examples: rcadm --manage --cache-disk r --disk 1 2 3 rcadm -M -cd w -d * **HIDE ARRAY** --hide --array <list> -h -a <list> Examples: rcadm --manage --hide --array 5 6 rcadm -M -h -a 4 **UNHIDE ARRAY** --unhide --array <list> -uh -a <list> Examples: rcadm --manage --unhide --array * rcadm -M -uh -a 5 **INITIALIZE DISK** --initialize-disk --disk <list> -id -d <list> Examples: rcadm --manage --initialize-disk --disk * rcadm -M -id -d 1 2 3 NAME ARRAY --name "name" --array <list> -n "name" -a <list> Examples: rcadm --manage --name "System Disk" --array 5 rcadm -M -n "Backup Disk" -a 4 QUERY --query [--array <list>] [--disk <list>] [--verbose] -q [-a <list>] [-ct <list>] [-d <list>] [-v] Examples: rcadm --manage --query --array 1 --disk --verbose rcadm -M -q -a 1 2 3 -d -v

QUERY ALL --query-all -qa Example: rcadm --manage --query-all **RESCAN DISKS** --rescan -rsc Example: rcadm --manage --rescan SCAN ARRAY --scan-array <on|off> --array <array_number> -sa <on|off> -a <array_number> Example: rcadm -M --array 1 --scan-array on cadm -M -a 1 -sa off SMART POLL --smart-poll <on|off> --disk <list> -sp <on|off> -d <list> Example: rcadm --manage --smart-poll on --disk rcadm -M -sp off -d 1 2 3 TASK CONTROL --task <task_operation> --array <array_number> -t <task_operation> -a <array_number> Task Operation <pause> to temporarily pause a task <resume> to continue running a task <remove> to permanently remove a task Examples: rcadm --manage --task pause --array 5 rcadm -M -t remove -a 4 TASK PRIORITY --priority <1..10> --array <list> -p <1..10> -a <list> Examples: rcadm --manage --priority 5 --array 6 rcadm -M -p 1 -a **UNLINK ARRAY** --unlink --array <array_number> -ul -a <array_number> Examples: rcadm --manage --unlink --array 2 rcadm -M -ul -a 5

rcadm -C

CREATE

Long form:

rcadm --create <raid_type> --disk <list> [--size <size_mb>]
[--sub-member <num>] [--spare-disk <list>]
[--no-sync] [--d-spare] [--cache <r,rw,w,nc>]
[--max-size] [--name "name"] [--priority <1..10>]
[--zero][--scan-array]

Short form:

rcadm -C <raid_type> -d <list> [-s <size_mb>] [-sub <num>]

[-sp <list>] [-ns] [-ds] [-ca <r, rw, w, nc>] [-ms]

[-n "name"] [-p <1..10>] [-z] [-sa] }

RAID Types:

volume,	-v	Single disk or concatenation of disks (JBOD)
raidable,	-ra	Single disk, RAIDAble
raid0,	-r0	Stripe of two or more disks
raid1,	-r1	Mirror of two disks
raid10,	-r10	Stripe set of mirror sets
raid5,	-r5	Stripe set with parity, three to sixteen disks

OPTIONS

-sp, --spare-disk

Specifies the dedicated spare disk or disks to assign, with a maximum of four. No space is reserved on the selected disks.

-s, --size

Specifies the size of the array in MBs. If you do not use this option, the largest possible size is used by default.

-ns, --no-sync

Disables background synchronization of redundant types when creating the array.

-ca, --cache

Specifies a cache setting for the array(s): read cache <r>, read and write-back cache <rw>, write-back cache <w>, or no cache <nc>. The default is read and write-back cache <rw>.

-ms, --max-size

Prints the maximum possible size for an array without actually creating an array.

-n, --name

Identifies an array with a user-supplied name. The name can be up to

30 characters, but only 17 of those characters display in the BIOS.

Sets the background initialization task priority from 1 to 10, with 10 being the highest priority. For redundant array types only.

-led, --leave-existing-data

Leaves the existing data on the disks untouched after the array is created. This option can be used to try to recover user data when an array has been accidentally deleted or the configuration information is lost but the data is still intact. Unless you immediately recreate the array after deleting it and no other tasks have been performed, the likelihood of recovering data with this method is very low.

-d, --disk

A required qualifier used with the --create option to specify the disk or disks to be included in the array.

-sa, --scan-array

Specifies that a background array scan should be continuously run whenever the array is idle (Default is off).

-z, --zero

Zero the array in the foreground. This method is faster than doing a background consistency verifies if the array is a redundant type. For non redundant types the zero option can be used to verify all blocks in the array can be accessed.

EXAMPLES

Example: Create a RAID5 set of the maximum possible size using all disks.

rcadm -C --raid5 --disk *

Example: Create a RAID1 set of the maximum possible size, with a spare disk and without a background initialization task.

rcadm -C --raid1 --spare-disk 3 --disk 1 2 --no-sync Example: Print the maximum size a RAID5 array could be using all disks without actually creating the array.

rcadm -C --raid5 --disk * --max-size

rcadm -D

DELETE Long form: --delete --array <list> [--no-ask] Short form: -D -a <list> [-na] [-cg <group number>]

OPTIONS

-na, --no-ask

If the no ask option is specified the array is deleted without confirmation.

EXAMPLES Example: Delete arrays 1 and 2. rcadm -D --array 1 2 Example: Delete all arrays. rcadm -D --array