EFCO Technology Application Note

Document Name	AN10_AIHx_RAID setting	
Applicable Products	All AIH series	
Application Note Subject	RAID 0,1,5	
Usage Designation	□ Internal ■ External	

Preface

Revision History

Revision	Date	Author	Description
1.0	2020/12/18	J Yen	Preliminary release

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Warnings, Cautions and Notes

Warning! Warnings indicate conditions, which if not observed, can cause personal injury!



Caution! Cautions are included to help you avoid damaging hardware or losing data.



data.



Notes provide optional additional information.



Title

How to create RAID disk on AIH series product?

Answer

AIH series can support 3 type RAID functions, RAID 0 (stripe), RAID 1 (mirroring) and, RAID 5 (distributed parity).

RAID 0 (Stripe)

Software stripping and block interleave (minimum 2 drives). Data is written to each drive-in succession, each block going to the next available drive (striping) for a faster operation and less chance of overloaded. The volume can of course be much larger than any single drive. Since no redundancy is provided, the failure of a single drive brings the system down.

RAID 1 (Mirror)

Disk mirroring and duplexing (minimum 2 drives). Drives are used in pairs and all data is written identically to both drives. Each drive can be duplexed by connecting to its own interface controller. The failure of one drive does not bring down the system. Instead, the other drive continues to operate. Of course, two drives are now used for the equivalent storage capacity of one drive.

RAID 5 (Parity)

Blocks interleave, and data striping with distributed check data on all drives. The one to use for NetWare. Parity information is distributed across all drives. RAID 5 efficiency goes up as the number of disks increases. You can use hot spares to rebuild a failed drive on "the fly". The best choice in multi-user environments, which are not write performance sensitive. However, at least three, and more typically five drives, are required for RAID 5 arrays.

RAID 0 (Stripe)

Step 1: Power on and press "*Del*" key to enter into BIOS setting mode.

Step 2: Follow the steps below, "Chipset" → "PCH-IO Configuration" → "SATA and RST Configuration" → "SATA Mode Selection", and then change setting to "Intel RST Premium With Intel Optane System Acceleration"

Aptio Setup Utility - Chipset	Copyright (C) 2020 American	Megatrends, Inc.
SATA And RST Configuration		Determines how SATA
SATA Controller(s) SATA Mode Selection SATA Test Mode ▶ Software Feature Mask Configuration Aggressive LPM Support SATA Controller Speed	[Enabled] [AHCI] [Disabled] [Enabled] [Default]	controller(s) operate.
Serial ATA Port 0 Software Presen Port 0 Hot Plug Configured as a	Empty SATA Mode Selection ————————————————————————————————————	cceleration
Spin Up Device		m
SATA Device Type Serial ATA Port 1	[Hard Disk Drive] Empty	⊢nter: Select +/−: Change Opt.
Software Preserve	Unknown	F1: General Help
Port 1 Hot Plug	[Enabled]	F2: Previous Values F3: Ontimized Defaults
Configured as eSATA	Hot Plug supported	F4: Save & Exit
Spin Up Device	[Disabled]	ESC: Exit
Serial ATA Port 2	Empty	
Software Preserve	Unknown	
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Step 3: Press "**F4**" key to save and exit, and then press "**DEL**" key to enter into BIOS mode again.

Aptio Setup Utili Chipset	ty – Copyright (C) 2020 Americ	an Megatrends, Inc.
SATA And RST Configuration		Determines how SATA
SATA Controller(s)	[Enabled]	controller(s) operate.
SATA Mode Selection	[Intel RST Premium With Intel Optane System Acceleration]	
SATA Test Mode	[Disabled]	
RAID Device ID	[Client]	
▶ Software Feature Mask Configura	t ion	
Aggressive LPM Support	Save & Exit Setup —	
SATA Controller Speed	the state of the s	
	Save configuration and exit?	
Serial Ala Port U		t: Calcot Concon
Port 0	Ves No	I: Select Item
Hot Plug		nter: Select
Configured as eSATA		/-: Change Opt.
Spin Up Device	[Disabled]	F1: General Help
SATA Device Type	[Hard Disk Drive]	F2: Previous Values
Serial ATA Port 1	Empty	F3: Optimized Defaults
Software Preserve	Unknown	F4: Save & Exit
Port 1	[Enabled]	ESC: Exit
Hot Plug	[Disabled]	
Spin Up Device	Displad	
opin op bevice	[Disabled]	
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Step 4: Follow the steps below: "Advanced" → "Intel® Rapid Storage Technology" → " Create RAID Volume" to create RAID.

Aptio Setup Utility – Copyright (C) 2020 American Advanced	Megatrends, Inc.
Intel(R) RST 15.5.0.2858 RAID Driver ▶ Create RAID Volume	This page allows you to create a RAID volume
Non-RAID Physical Disks: > SATA 0.3, InnoDisk Corp mSATA 3ME3 0011609260290001, 14.9GB > SATA 0.4, InnoDisk Corp mSATA 3ME3 1221AA170900002D, 14.9GB	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Step 5: Select "RAIDO (Stripe).



Aptio Setup Utility – Advanced	Copyright (C) 2020 American	Megatrends, Inc.
Create RAID Volume		X - to Select Disk
Name: RAID Level:	Volume1 [RAIDO(Stripe)]	
Select Disks: SATA 0.3, InnoDisk Corp. – mSATA SME3 0011609260290001, 14.9GB SATA 0.4, InnoDisk Corp. – mSATA SME3 1221AA170900002D, 14.9GB		
Strip Size: Capacity (MB):	[16KB]	
 Create Volume 		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Vancian 2 19 1262 Ca	ununidht (C) 2020 Amenican M	adataando Too

Step 6: Select disks. (2 storage devices minimum required)

Step 7: Click "Create Volume" → "Volume1, RAID0 (Stripe), xxxxGB, Normal" to check disk status and size.

Aptio Setup Utility - Advanced	- Copyright (C) 2020 Amer	ican Megatrends, Inc.
Create RAID Volume		X - to Select Disk
Name: RAID Level:	Volume1 [RAIDO(Stripe)]	
Select Disks: SATA 0.3, InnoDisk Corp. – mSATA 3ME3 0011609260290001, 14.9GB SATA 0.4, InnoDisk Corp. – mSATA 3ME3 1221AA170900002D, 14.9GB	[X] [X]	
Strip Size: Capacity (MB): ▶ Create Volume	[16KB] 30539	<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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Aptio Setup Utility – Copyright (C) 2020 American	Megatrends, Inc.
RAID Volumes: ▶ Volume1, RAIDO(Stripe), 29.8GB, Normal	Select to see more information about the RAID Volume
	<pre></pre>
Version 2.18.1263. Copyright (C) 2020 American M	egatrends, Inc.
Aptio Setup Utility – Copyright (C) 2020 American Advanced	Megatrends, Inc.
Aptio Setup Utility – Copyright (C) 2020 American Advanced RAID VOLUME INFO Volume Actions Delete	Megatrends, Inc.
Aptio Setup Utility - Copyright (C) 2020 American Advanced RAID VOLUME INFO Volume Actions Delete Name: Volume1 RAID Level: RAID0(Stripe) Strip Size: 29.8GB Status: Normal Bootable: Yes SATA 0.3, InnoDisk Corp mSATA 3ME3 0011609260290001, 14.9GB SATA 0.4, InnoDisk Corp mSATA 3ME3 1221AA170900002D, 14.9GB	<pre>Megatrends, Inc. ++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Step 8: Press "**F4**" key to save and exit, and then reboot the system.

Step 9: Insert Windows OS source disk, and then Press "F7" key choose boot from source disk.

Please select boot device:		
UEFI: Built-in EFI Shell UEFI: KingstonDataTraveler 3.0PMAP, Partition 1 KingstonDataTraveler 3.0PMAP Enter Setup		
↑ and ↓ to move selection ENTER to select boot device ESC to boot using defaults		



Step 10: Follow the steps to install Windows system.

 Caution!
 For Windows 7 OS, install Intel RST driver first before the OS setup.

 Link her:
 https://downloadcenter.intel.com/zh

 tw/download/28992/Intel-Intel-RST-?product=55005

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Step 11: Finish OS installation and check the storage size.

RAID 1 (Mirror)

Step 1 ~ Step 4: Same as "RAID 0" steps.

Step 5: Select "RAID1 (Mirror).

Aptio Setup Utility – Advanced	Copyright (C) 2020 Americar	Megatrends, Inc.
Advanced Create RAID Volume Name: RAID Level: Select Disks: SATA 0.3, InnoDisk Corp mSATA SME3 0011609260290001, 14.9GB SATA 0.4, InnoDisk Corp mSATA SME3 1221AA170900002D, 14.9GB Strip Size: Capacity (MB): Create Volume Select at least two disks	Volume1 [RAIDO(Stripe)] [] [] RAID Level: RAIDO(Stripe) RAID1(Mirror) Recovery	<pre>Select RAID Level ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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Step 6: Select disks. (2 storage devices minimum required)

Aptio Setup Utility – Advanced	Copyright (C) 2020 American	Megatrends, Inc.
Create RAID Volume Name: RAID Level:	Volume1 [RAID1(Mirror)]	X – to Select Disk
Select Disks: SATA 0.3, InnoDisk Corp. – mSATA 3ME3 0011609260290001, 14.9GB SATA 0.4, InnoDisk Corp. – mSATA 3ME3 1221AA170900002D, 14.9GB	[X] [X]	
Capacity (MB):	15269	
▶ Create Volume		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263. Co	pyright (C) 2020 American Me	egatrends, Inc.

Step 7: Click "Create Volume" → "Volume1, RAID1(Mirror), xxxxGB, Normal" to check disk status and size.

Aptio Setup Utility Advanced	– Copyright (C) 2020 America	n Megatrends, Inc.
Create RAID Volume		X - to Select Disk
Name: RAID Level:	Volume1 [RAID1(Mirror)]	
Select Disks: SATA 0.3, InnoDisk Corp. – mSATA SME3 0011609260290001, 14.9GB	[X]	
3ME3 1221AA170900002D, 14.9GB	[×]	
Capacity (MB):	15269	
▶ Create Volume		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263.	Copyright (C) 2020 American	Megatrends, Inc.
Aptio Setup Utility	Conunight (C) 2020 Amonios	
Advanced	- copyright (c) 2020 Himerica	n Megatrends, Inc.
Advanced Intel(R) RST 15.5.0.2858 RAID Drive	er	Select to see more information about the RAID Volume
Advanced Intel(R) RST 15.5.0.2858 RAID Drive RAID Volumes:	er	n Megatrends, Inc. Select to see more information about the RAID Volume
Advanced Intel(R) RST 15.5.0.2858 RAID Drive RAID Volumes: > Volume1, RAID1(Mirror), 14.96B, Nor	er emal	n Megatrends, Inc. Select to see more information about the RAID Volume
Advanced Intel(R) RST 15.5.0.2858 RAID Drive RAID Volumes: > Volume1, RAID1(Mirror), 14.9GB, Nor	er nmal	<pre>Megatrends, Inc. Select to see more information about the RAID Volume ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Aptio Setup Utilit Advanced	y – Copyright (C) 2020 Amer	rican Megatrends, Inc.
RAID VOLUME INFO Volume Actions ▶ Delete		
Name: RAID Level: Strip Size: Size: Status: Bootable:	Volume1 RAID1(Mirror) N/A 14.9GB Normal Yes	
 SATA 0.3, InnoDisk Corp mSATA 14.968 SATA 0.4, InnoDisk Corp mSATA 14.968 	3ME3 0011609260290001, 3ME3 1221AA170900002D,	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263	. Copyright (C) 2020 Americ	can Megatrends, Inc.

- **Step 8:** Press **"F4**" key to save and exit, and then reboot system.
- **Step 9:** Insert Windows OS source disk, and then Press "F7" key to choose boot from source disk.

Please select boot device:		
UFFI: Built-in FFI Shell UEFI: KingstonDataTraveler 3.0PMAP, Partition 1 KingstonDataTraveler 3.0PMAP Enter Setup		
↑ and ↓ to move selection ENTER to select boot device ESC to boot using defaults		

Step 10: Follow the steps to install the Windows system.

Language to install: English (United States) Time and currency format: Chinese (Traditional, Taiwan) Keyboard or input method: Microsoft Bopomofo Enter your language and other preferences and click "Next" to continue. * 2018 Microsoft Corporation. All rights reserved.	ndows Setup	
Language to install: English (United States) Time and currency format: Chinese (Traditional, Taiwan) Keyboard or input method: Microsoft Bopomofo Enter your language and other preferences and click "Next" to continue. Enter your language and other preferences and click "Next" to continue.	. Windows ⁻	
Ime and currency format: Chinese (Traditional, Taiwan)	Language to install: English (United States)	-
Keyboard or input method: Microsoft Bopomofo	Iime and currency format: Chinese (Traditional, Taiwan)	-
Enter your language and other preferences and click "Next" to continue.	Keyboard or input method: Microsoft Bopomofo	<u> </u>
© 2018 Microsoft Corporation. All rights reserved.	Enter your language and other preferences and click "Next	t" to continue.
	2018 Microsoft Corporation. All rights reserved.	Next



Caution!

For Windows 7 OS, install Intel RST driver first before the OS setup. Link here: <u>https://downloadcenter.intel.com/zh-</u> <u>tw/download/28992/Intel-Intel-RST-?product=55005</u>

Step 11: Finish OS installation and check the storage size.

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	8 items 1 item selected		
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RAID 5 (Parity)

Step 1 ~ Step 4: same as "RAID 0" steps.

Step 5: Select "RAID5 (Parity).

Aptio Setup Utility - Advanced	Copyright (C) 2020 American	Megatrends, Inc.
Create RAID Volume Name: RAID Level: Select Disks: SATA 0.1, TOSHIBA MK3276GSX Y2TBY1JSF, 298.0GB SATA 0.3, InnoDisk Corp mSATA 3ME3 0011609260290001, 14.9GB SATA 0.4, InnoDisk Corp mSATA 3ME3 1221AA170900002D, 14.9GB Strip Size: Capacity (MB): Create Volume Select at least two disks	Volume1 [RAIDO(Stripe)] [] [] RAID Level: RAIDO(Stripe) RAIDI(Mirror) RAIDS(Parity) RAIDS(Parity) RECOVERY	<pre>>> Select RAID Level >>> Select RAID Level >>> Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263. C	opyright (C) 2020 American M	egatrends, Inc.

Step 6: Select disks. (3 storage devices minimum required)

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Advanced			
Create RAID Volume Name: RAID Level: Select Disks: SATA 0.1, TOSHIBA MK3276GSX Y2TBY1JSF, 298.0GB SATA 0.3, InnoDisk Corp mSATA 3ME3 0011609260290001, 14.9GB SATA 0.4, InnoDisk Corp mSATA 3ME3 1221AA170900002D, 14.9GB	Volume1 [RAID5(Parity)] [X] [X]	Create a volume with the settings specified above	
Strip Size: Capacity (MB): ▶ Create Volume	[128KB] 30539	<pre>++: Select Screen t1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>	
Version 2.18.1263. (Copyright (C) 2020 American M	egatrends, Inc.	

Step 7: Click "Create Volume"→"Volume1, RAID5(Parity), xxxxGB, Normal" to check disk status and size.

Aptio Setup Utility - Advanced	Copyright (C) 2020 America	an Megatrends, Inc.
Create RAID Volume Name: RAID Level: Select Disks: SATA 0.1, TOSHIBA MK3276GSX Y2TBYJJSF, 298.0GB SATA 0.3, InnoDisk Corp mSATA 3ME3 0011609260290001, 14.9GB SATA 0.4, InnoDisk Corp mSATA 3ME3 1221AA170900002D, 14.9GB Strip Size: Capacity (MB): ▶ Create Volume	Volume1 [RAID5(Parity)] [X] [X] [X] [128KB] 30539	Create a volume with the settings specified above ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.1263. C	opyright (C) 2020 American	Megatrends, Inc.
Aptio Setup Utility - Advanced	Copyright (C) 2020 America	an Megatrends, Inc.
RAID VOLUME INFO Volume Actions Delete Name: RAID Level: Strip Size: Size: Status: Bootable: SATA 0.1, TOSHIBA MK3276GSX Y2TBY1J SATA 0.3, InnoDisk Corp mSATA 3M 14.9GB SATA 0.4, InnoDisk Corp mSATA 3M 14.9GB	Volume1 RAID5(Parity) 128KB 29.8GB Normal Yes SF, 298.0GB E3 0011609260290001, E3 1221AA170900002D,	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Megatrends, Inc.

- **Step 8:** Press "**F4**" key to save and exit, and then reboot the system.
- **Step 9:** Insert Windows OS source disk, and then press "F7" key to choose boot from source disk.





Step 10: Follow the steps to install Windows system.

 Caution!
 For Windows 7 OS, install Intel RST driver first before the OS setup.

 Link here: https://download/28992/Intel-Intel-RST-?product=55005

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Step 11: Finish OS installation and check the storage size.