



LSI 2308 SAS
Configuration Utility

USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

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Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides instructions on how to use the LSI™ 2308 configuration utility to configure RAID settings for Supermicro motherboards.

Manual Organization

Chapter 1 provides an overview on the LSI™ 2308 software utility.

Chapter 2 provides an introduction to the LSI 2308 SAS software utility settings and how to run the LSI 2308 SAS Configuration utility using IR Mode.

Chapter 3 provides instructions on how to run the LSI 2308 SAS Configuration utility using IT Mode.

Conventions Used in This Manual

Pay special attention to the following symbols for proper installation and to prevent damage to the system or injury to yourself.

Warning: Important information given to prevent erroneous RAID configuration and to ensure proper system setup.



Note: Additional information given to ensure correct RAID configuration setup.

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Chapter 1

Introduction

After you have installed hardware components, you must first configure LSI 2308 SAS settings before you install an operating system and other software drivers.

 **Note:** If you do not wish to configure LSI Software RAID settings, proceed with the OS installation. For OS installation instructions, refer to related documents posted on our website at www.supermicro.com.

1-1 Overview of the LSI 2308 SAS Controller

The LSI 2308 SAS Controller, which is based on the Fusion-MPT (Message Passing Technology) architecture, integrates advanced SAS and PCI-Express technologies to deliver a processor-based, cost-effective RAID management tool for mid-level servers that require high system availability and redundancy without full-featured RAID implementation. The supported Integrated RAID options include RAID 1 (Integrated Mirroring), RAID 1E (Integrated Mirroring Enhanced), RAID 0 (Integrated Striping) and RAID 10 (Integrated Mirroring and Striping). These RAID configurations are easy to configure and should satisfy most internal RAID requirements.

The LSI 2308 Controller supports eight PCI-E lanes with transfer rates of up to 8.0 GT/s per lane for PCI-E 3.0, while remaining backwards compatible to the 5.0/2.5 GT/s data rate supported by PCI-E 2.0/1x. It also supports End-to-End CRC (ECRC) with Advanced Error Reporting (AER), power management, hot plug support, and legacy interrupt.

Features of the LSI 2308 Controller

The LSI SAS 2008 Controller supports the following features:

Integrated RAID

- RAID 0, RAID 1, RAID 1E, and RAID 10 supported

PCI-Express to 8-Port SAS/SATA Controller with data rates of:

- 8.0 GT/s for PCI-E 3.0
- 5.0 GT/s for PCI-E 2.0
- 2.5 GT/s for PCI-E 1x

High Performance

- PowerPC 440 @ 800MHz

6Gb/s SAS Interface

- 8-port SAS/SATA controller
- 1.5 Gb/s, 3 Gb/s, and 6 Gb/s SAS/SATA data transfer rates supported
- Spread Spectrum Clocking supported
- SSP, SMP (Symmetric Multiple Processing), STP (Spanning Tree Protocol), and SATA (Serial-ATA) protocols supported
- SAS and SATA devices supported
- T-10 data protection
- MegRAID Storage Manger Software supported

PCI-Express 3.0

- PCI-E x8 with a transfer rate of up to 8.0 GT/s per lane, full duplex
- End-to-End CRC (ECRC) and Advanced Error Reporting (AER) supported

Power Management Support

- Sleep and Standby power mode support for SATA
- Programmable SAS link power down
- Variable PCI-E bandwidth negotiation

Network Communication

- I²C support for enclosure management

SFF-8485 (Serial Link General Input/Output) Specification-compliant

Functions of the LSI SAS Configuration Utility

- Support for BIOS Boot Specification (BBS) (if available in the system BIOS)
- Support for Interrupt 13 and Enhanced Disk Drive Specification
- Support for Enable/Disable BIOS Boot
- Support for Hot-plug and Hot Auto Rebuild (during a hot plug event)

Drives supported by the LSI 2308 Utility

The following drive features are supported by the LSI 2308 Software utility:

- Support for RAID 0, RAID 1, RAID 1E, and RAID 10
- Online mirror rebuilding
- Online consistency checking

- Array system management
- Error logging and notification
- Automatic resume of rebuilding on restart
- Support for manual rebuilding
- Array initialization support
- Logical drive available immediately after creation

1-2 RAID Modes Supported by the LSI 2308 SAS Controller

The LSI SAS/SATA 2308 Controller supports IR (Integrated RAID) Mode and IT (Initiator and Target) Mode.

 **Note:** These two RAID modes require different firmware and drivers. Be sure to download the correct RAID mode driver before installing it to the OS. For firmware downloads and assistance, please contact Supermicro Technical Support at www.supermicro.com or Support@supermicro.com.

IR Mode Configuration

To create an IR RAID storage configuration, you will need to configure physical disk drives into arrays first. An array is a group of one to eight physical disks treated by a host computer as one large disk drive (logical drive). Only one RAID level can be assigned to an array.

IT Mode (Initiator and Target Mode)

This is a Non-RAID mode. To use this mode, be sure to flash an IT mode firmware to the EEPROM and install an IT Mode driver to the system OS.

1-3 RAID Levels Supported by the LSI 2308 Controller

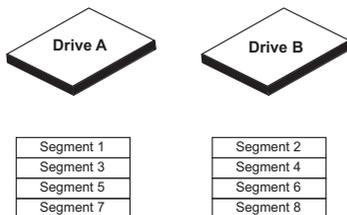
The LSI embedded Software Configuration utility adds RAID functionality to enhance system efficiency and data security by supporting RAID 0, RAID 1, RAID 1E, and RAID 10.

RAID 0 (Integrated Striping) can greatly enhance hard disk I/O performance by striping data across multiple drives. RAID 1 (Integrated Mirroring) and RAID 1E (Integrated Mirroring Enhanced) allow data to be simultaneously written to multiple drives, increasing data integrity. RAID 10, combining RAID 1 and RAID 0, provides superb system performance and system security.

 **Note:** A maximum of 2 RAID volumes and 16 physical disk drives (includes 2 hot spares) is supported for onboard RAID in IR mode.

RAID 0

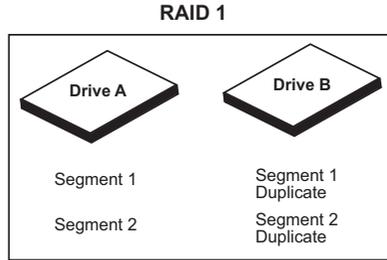
RAID 0 (Integrated Striping) can greatly enhance hard disk I/O performance by striping data across all disk drives in an array or drive group. This RAID configuration does not provide data redundancy, but it offers the best RAID performance and a high bandwidth. The following illustration provides a visual example of a RAID 0 drive group.



RAID 0 Example

RAID 1

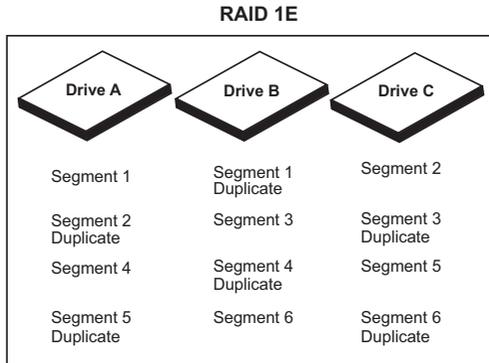
RAID 1 (Integrated Mirroring) allows data to be simultaneously written to multiple drives. This RAID configuration increases data integrity by providing redundancy, but requires twice the amount of data storage capacity. Two drives are required to complete a RAID 1 configuration. The following illustration provides a visual example of a RAID 1 drive group.



RAID 1 Example

RAID 1E

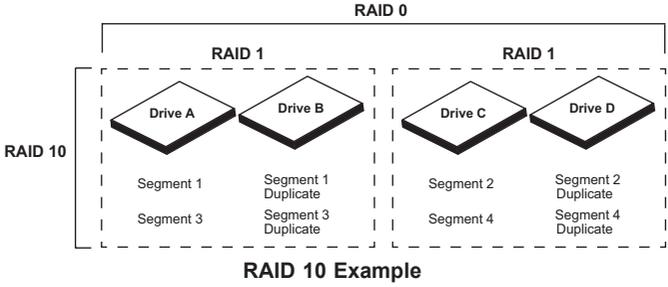
RAID 1E (Integrated Mirroring Enhanced) is a non-standard RAID configuration that combines data striping (RAID 0 functionality) with data redundancy (RAID 1 functionality). In this configuration, data is striped across all drives and a copy of each stripe is stored on a different drive. RAID 1E requires at least 3 drives, with additional drives added in pairs (total number of drives is an odd number). The following illustration provides a visual example of a RAID 1E virtual drive group.



RAID 1E Example

RAID 10

RAID 10 (a combination of RAID 1 and RAID 0) provides superb system performance and system security. RAID 10 stripes data across the primary disks in a drive group and then duplicates that data to the secondary disks in a drive group. RAID 10 requires a minimum of 4 drives. Any additional drives must be added in pairs (6 drives, 8 drives, etc). The following illustration provides a visual example of a RAID 10 virtual drive group.



RAID 10 Example

Chapter 2

Configuring the LSI 2308 IR Mode Settings

This chapter provides configuration instructions for the LSI 2308 SAS configuration utility for IR Mode settings. If you do not wish to configure LSI Software RAID settings, skip this section and go directly to OS Installation. For OS installation instructions, please refer to our website at www.supernmicro.com.

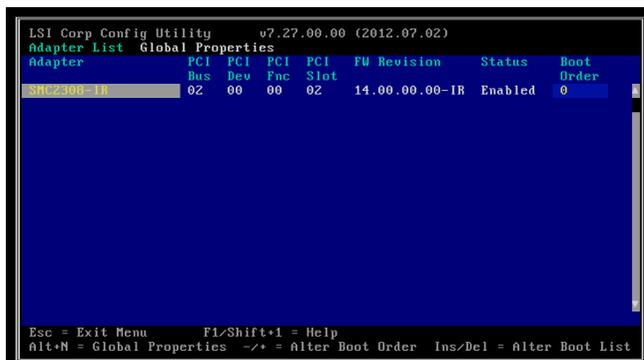
Notes:

1. A maximum of 2 RAID volumes and 16 physical disk drives (includes 2 hot spares) is supported for onboard RAID in IR mode.
2. For system stability, do not use both SAS and SATA drives in the same array.

2-1 Using the LSI 2308 Configuration Utility in IR Mode

Follow the steps indicated below to configure arrays and logical drives in SAS IR Mode.

1. Power on the system.
2. When the LSI MPTSAS Initialization screen displays, press <CTRL> and <C> to enter the LSI configuration utility (shown below).



```
LSI Corp Config Utility v7.27.00.00 (2012.07.02)
Adapter List Global Properties
Adapter PCI PCI PCI PCI FW Revision Status Boot
        Bus Dev Fnc Slot          Order
-----
00:00:01 02 00 00 02 14.00.00.00-IR Enabled 0

Esc = Exit Menu      F1/Shift+1 = Help
Alt+N = Global Properties  -/+ = Alter Boot Order  Ins/Del = Alter Boot List
```

LSI Configuration Utility

- Highlight the LSI 2308 setting you would like to configure and press <Enter> to display the configuration utility main page as shown below.

```

LSI Corp Config Utility      v7.27.00.00 (2012.07.02)
Adapter Properties -- SAS2308-1

Adapter                SMC2308-IR
PCI Slot                02
PCI Address(Bus/Dev)   02:00
MPT Firmware Revision  14.00.00.00-IR
SAS Address             50030480:0705EB00
NUDATA Version         0E.03.00.12
Status                 Enabled
Boot Order              0
Boot Support            Enabled BIOS & OS

RAID Properties
SAS Topology
Advanced Adapter Properties

Esc = Exit Menu          F1/Shift+F1 = Help
Enter = Select Item     -/+Enter = Change Item
    
```

LSI Configuration Utility Main Page

- Highlight *Boot Support* (see above) and press <-> or <+> to change the setting. Press <Enter> to select the desired setting. (The default setting for *Boot Support* is *Enabled BIOS & OS*.)

 **Note:** For more information on an item, press <F1> or <Shift F1> to access help information.

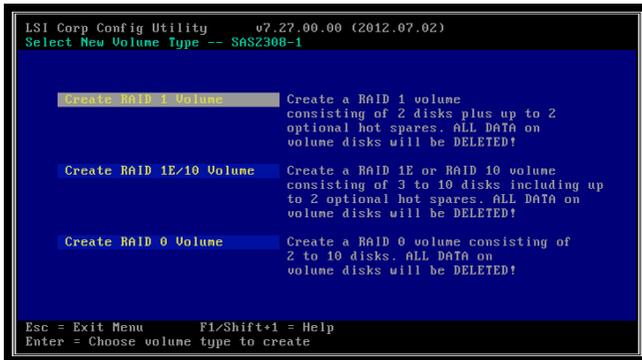
2-2 Creating RAID Volumes

In IR mode, you can create RAID 1, RAID 0, and RAID 1E/10 volumes. The procedure for creating each RAID volume is the same; however the amount of physical disks in a volume varies for each configuration as follows:

- RAID 1: This configuration consists of 2 disk drives, including up to 2 optional hot spares.
- RAID 0: This configuration consists of 2 to 10 disk drives.
- RAID 1E/10: This configuration consists of 3 to 10 disk drives, including up to 2 optional hot spares.

Use the following procedure to create a RAID 1, RAID 0, and RAID 1E/10 volumes

1. From the LSI Configuration Utility main page, select *RAID Properties* and press <Enter> to display the RAID configuration options, as shown below.



RAID Configuration Options

2. Select the desired configuration option and press <Enter>. The following screen displays.

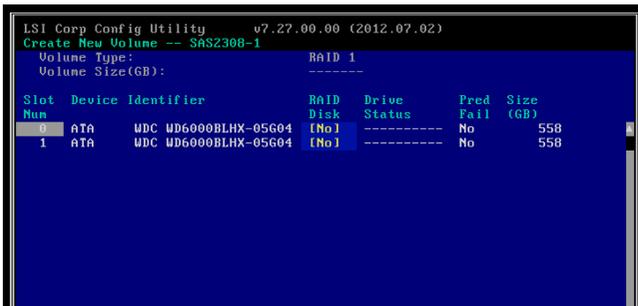


Figure 2.3

3. Use the arrow keys to navigate the following fields:

- **Slot Num:** This field indicates the slot numbers of the disk drives that will be configured into the RAID volume.
- **Device Identifier:** This field indicates the manufacturer of the hard disk drive.
- **RAID Disk:** This field indicates if the disk drive specified is a RAID device. To change a non-RAID drive to a RAID drive, navigate to the RAID Disk field for the desired drive and press <-> or <+> to select the drive for a RAID volume. Press <C> to create a RAID volume. You can follow the same procedure to change a RAID drive to a non-RAID drive.

Warning: When creating a RAID volume, all existing data on the disks will be erased.

- **Drive Status:** This field displays the status of the disk drive.
- **Pred Fail (Predicting Failure):** This field indicates if SMART (Self-Monitoring, Analysis, and Reporting Technology) predicts that the disk drive will fail. SMART is a monitoring system used to detect and report on the various health conditions of a hard drive. If a hard disk failure is anticipated by SMART, it is strongly recommended that you replace the hard drive before creating a RAID volume on the disk drive.
- **Size:** This item displays the size (in GB) of the individual hard drive.

 **Notes:**

1. The size of the volume created in a disk drive does not reflect the actual size of the disk.
2. If a RAID set consists of two or more disk drives, the size of the RAID volume indicates the total RAID volume created by all the disks within the RAID set combined.

2-3 Managing Volume

This feature allows you to perform the following management tasks on the RAID volumes:

- Manage Hot Spares
- Perform a Consistency Check
- Activate a Volume
- Delete a Volume
- Perform Online Capacity Expansion

From the LSI configuration utility main page (page 2-2), select **RAID Properties** and press <Enter>. The following displays.

```

LSI Corp Config Utility      v7.27.00.00 (2012.07.02)
View Volume -- SAS2308-1
Volume                      1 of 1
Identifier                   LSI      Logical Volume 3000
Type                         RAID 1
Size(GB)                     557
Status                       Optimal
Task                          None

Manage Volume

Slot Device Identifier      RAID Hot Drive   Pred Size
Num  ATA  WDC MD6000BLHX-05G04  Yes No   Primary No   557
  1  ATA  WDC MD6000BLHX-05G04  Yes No   Secondary No  557

Esc = Exit Menu      F1/Shift+1 = Help
Enter=Select Item   Alt+N=Next Volume
  
```

Manage Volumes Option

Select **Manage Volume** (above) and press <Enter>. A list of RAID management options displays, as shown below.

```

LSI Corp Config Utility      v7.27.00.00 (2012.07.02)
Manage Volume -- SAS2308-1

Identifier                   LSI      Logical Volume 3000
Type                         RAID 1
Size(GB)                     557
Status                       Optimal
Task                          None

Manage Hot Spares

Consistency Check

Activate Volume

Delete Volume

Online Capacity Expansion

Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item
  
```

Manage Volume Submenu

Manage Hot Spares

From the Manage Volumes submenu (page 2-5), select **Manage Hot Spares** and press <Enter> to display the following screen.

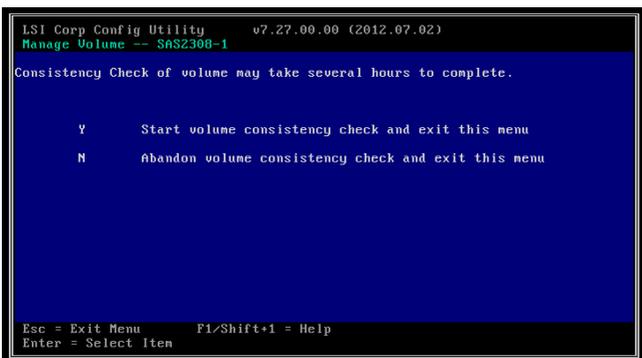


Manage Hot Spares

Use the arrow keys to navigate to the *Hot Spr* column (as shown above) for the desired drive and use the <+> or <-> key to change the setting. Select **Yes** to configure this device as a Hot Spare for the RAID Volume. Select **No** if you do not want this device to be used as a Hot Spare for the RAID Volume. (The default setting is No).

Consistency Check

From the Manage Volumes submenu (page 2-5), select **Consistency Check** and press <Enter>. The following screen displays.

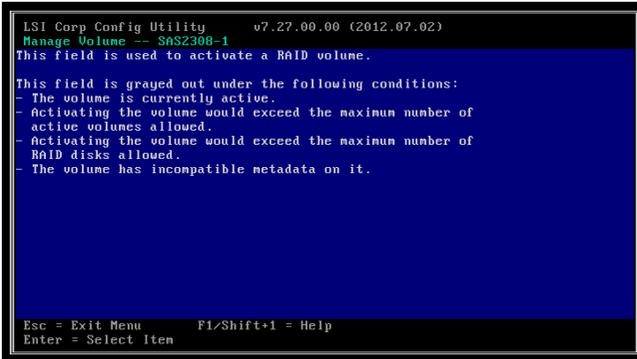


Consistency Check

Press <N> to abandon volume consistency check and exit the submenu or Press <Y> to start volume consistency check (the consistency check process may take several hours to complete).

Activate Volume

From the Manage Volumes submenu (page 2-5), select **Activate Volume** and press <Enter>. The following screen displays.



```
LSI Corp Config Utility      v7.27.00.00 (2012.07.02)
Manage Volume -- SAS2308-1
This field is used to activate a RAID volume.

This field is grayed out under the following conditions:
- The volume is currently active.
- Activating the volume would exceed the maximum number of
  active volumes allowed.
- Activating the volume would exceed the maximum number of
  RAID disks allowed.
- The volume has incompatible metadata on it.

Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item
```

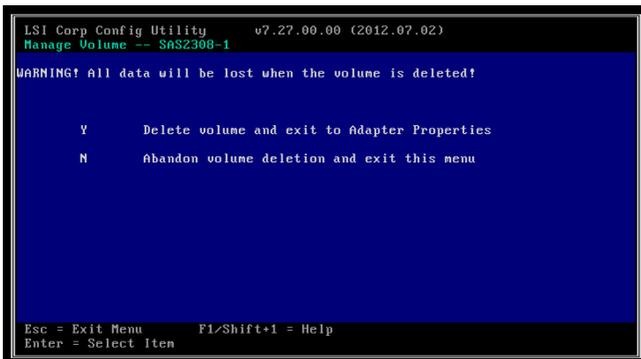
Activate RAID Volume

This feature is used to activate a RAID volume. It is not available when one of the following conditions occurs:

- The volume selected is currently active.
- Activating the volume will exceed the maximum number of active volumes or RAID disks allowed.
- The volume contains incompatible metadata on it.

Delete Volume

From the Manage Volumes submenu (page 2-5), select **Delete Volume** and press <Enter>. The following screen displays.



```
LSI Corp Config Utility      v7.27.00.00 (2012.07.02)
Manage Volume -- SAS2308-1
WARNING! All data will be lost when the volume is deleted!

      Y      Delete volume and exit to Adapter Properties
      N      Abandon volume deletion and exit this menu

Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item
```

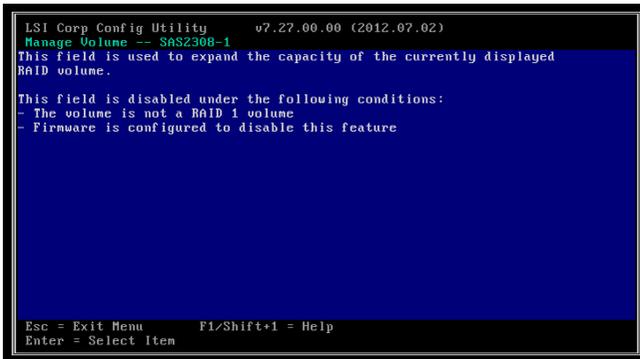
Delete RAID Volume

Press <N> to abandon volume deletion and exit the submenu or press <Y> to start deleting the RAID volume.

Warning! This feature is used to delete a RAID volume. When you delete a RAID volume, all data in the volume will be erased.

Online Capacity Expansion

1. From the Manage Volumes submenu (page 2-5), select **Online Capacity Expansion** and press <Enter>. Use this feature to expand the capacity of the current RAID volume if it is a RAID 1 volume, and is supported or enabled by your firmware.



Online Capacity Expansion

2-4 SAS Topology

From the LSI configuration utility main page (page 2-2), select **SAS Topology** and press <Enter> to display the submenu shown below.



SAS Topology Submenu

The SAS Topology submenu provides information on the following items. Select an item and press <Enter> to display information.

- ✎ **Note:** Use the right arrow key to scroll and view additional items.
- **Device Identifier:** This column displays the types of devices detected.
 - Select *Direct Attach Devices* and press <Enter> to display information on all physical disk drives installed on the controller.
 - Select *LSI Logical Volume 3000* and press <Enter> to display information on all logical drives.
- **Device Info:** This column indicates if the device is SAS or SATA. It also indicates if the device has been selected as the Boot Device and if the device is a hot spare.
- **Negotiated Link Speed:** This column displays the negotiated link speed for this Phy or if it is disabled.
- **Maximum Link Speed:** This column displays the maximum hardware link rate possible for this Phy.

2-5 Advanced Adapter Properties

From the LSI Configuration Utility main page (page 2-2), select **Advanced Adapter Properties** and press <Enter> to display the submenu shown below.



Advanced Adapter Properties Submenu

Advanced Device Properties

Select **Advanced Device Properties** from the Advanced Adapter Properties submenu (above) and press <Enter> to display the screen shown below.



Advanced Device Properties Submenu

Use the arrow keys to select any of the following items:

- Maximum INT 13 Devices for this Adapter:** This field displays the maximum amount of devices (attached to the adapter) for which you can install a pre-OS IO interface. The amount ranges from 0 to 24 devices.

- **IO Timeout for [selected] Devices:** This field displays the time (in seconds) which the host uses to timeout IOs for the following device types. The default setting is 10.
 - 00h (Direct Access)
 - 01h (Sequential Access)
 - 04h (Write Once)
 - 07h (Optical)
 - 0Eh (Simplified Direct Access)

- **LUNs to scan for [selected] Devices:** Use this field to control the LUN scan for the following types of devices. The default setting is All:
 - 00h (Direct Access)
 - 01h (Sequential Access)
 - 04h (Write Once)
 - 05h (CD-ROM)
 - 07h (Optical)
 - 0Eh (Simplified Direct Access)

Use the arrow keys to navigate to the desired item and press the <+> or <-> key to change the setting. Select **LUN 0 Only** to scan only LUN 0. Select **All** to scan all LUNs.

- **Removable Media Support:** Use this field to select the desired boot support (INT 13h interface installation) for Direct Access Removable Media devices. The default setting is None. Press the <+> or <-> key to select one of the following settings:
 - Select **None** for no boot support (no INT 13h interface installation) even if the device is selected as a first boot device or is first in the scan order.
 - Select **Boot Device Only** to provide boot support (INT 13h interface installation) only if the device is selected as the boot device.
 - Select **With Media Installed** to provide boot support (INT 13h interface installation) only if the device has media installed.
- **Restore Defaults:** Use this feature to restore all the above settings to the factory defaults.

Adapter Timing Properties

Select **Adapter Timing Properties** from the Advanced Adapter Properties submenu (page 2-10) and press <Enter> to display the screen shown below.



Adapter Timing Properties Submenu

Use the arrow keys to select one of the following items and press the <+> or <-> key to change the setting.

- **Direct Attached Spinup Delay:** Use this field to specify the number of seconds to wait between spinups of devices. For this setting to work properly, the device must be configured to require a spinup.
- **Direct Attached Max Targets to Spinup:** Use this field to specify the maximum number of targets that can spin up simultaneously.
- **Report Device missing Delay:** Use this field to specify the number of seconds the IO will delay reporting a target device missing after it becomes unavailable. The device will not be reported as missing if it returns before this timer expires.
- **IO Device Missing Delay:** Use this field to specify the number of seconds the IOC will delay replying to SCSI Initiator request messages when the addressed device is missing the target device is not accessible.

2-6 Exit

After you've changed SAS RAID configuration settings, press <Esc> to access the Exit menu as shown below.



Exit Menu

- **Cancel Exit:** Use this option to abort exiting and return to the LSI Configuration Utility.
- **Save changes then exit this menu:** Select this option to save the changes you've made and return to the LSI Configuration Utility.
- **Discard changes then exit this menu:** Select this option to discard the changes you've made and return to the LSI Configuration Utility.
- **Exit the Configuration Utility and Reboot:** Select this option to exit the LSI Configuration Utility and reboot the system.

Notes

Chapter 3

Configuring the LSI 2308 IT Mode Settings

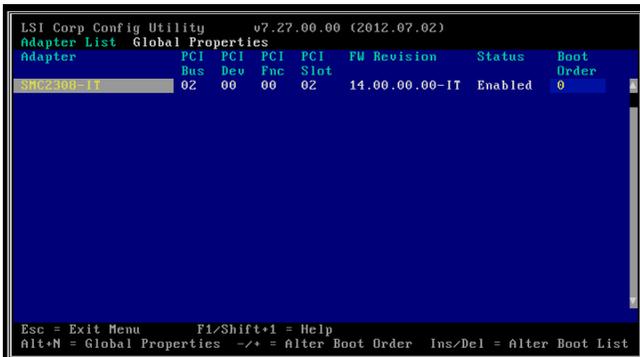
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 For system stability, do not use both SAS and SATA drives in the same array.

3-1 Using the LSI 2308 Configuration Utility in IT Mode

Follow the steps indicated below to configure arrays and logical drives in SAS IT Mode.

1. Power on the system.
2. When the LSI MPTSAS Initialization screen displays, press <CTRL> and <C> to enter the LSI SAS configuration utility (shown below).



```

LSI Corp Config Utility v7.27.00.00 (2012.07.02)
Adapter List Global Properties
Adapter      PCI PCI PCI PCI  FW Revision  Status  Boot
              Bus Dev Fnc Slot          Order
00C2308-IT  02  00  00  02    14.00.00.00-IT  Enabled  0
  
```

Esc = Exit Menu F1/Shift+1 = Help
 Alt+N = Global Properties -/+ = Alter Boot Order Ins/Del = alter Boot List

LSI Configuration Utility

- Highlight the LSI 2308 setting you would like to configure and press <Enter> to display the configuration utility main page as shown below.

```

LSI Corp Config Utility      v7.27.00.00 (2012.07.02)
Adapter Properties -- SAS2308-1

Adapter          SMC2308-IT
PCI Slot         02
PCI Address(Bus/Dev) 02:00
MPT Firmware Revision 14.00.00.00-IT
SAS Address      50030480:0705EB00
MUDATA Version   0E.03.00.04
Status           Enabled
Boot Order       0
Boot Support     [Enabled BIOS & OS]

SAS Topology

Advanced Adapter Properties

Esc = Exit Menu      F1/Shift+F1 = Help
Enter = Select Item  ~/+Enter = Change Item
    
```

LSI Configuration Utility Main Page

- Highlight *Boot Support* (see above) and press <-> or <+> to change the setting. Press <Enter> to select the desired setting. (The default setting for *Boot Support* is *Enabled BIOS & OS*.)

 **Note:** For more information on an item, press <F1> or <Shift F1> to access help information.

3-2 SAS Topology

From the LSI configuration utility main page (on previous page), select **SAS Topology** and press <Enter> to display the submenu shown below.



SAS Topology Submenu

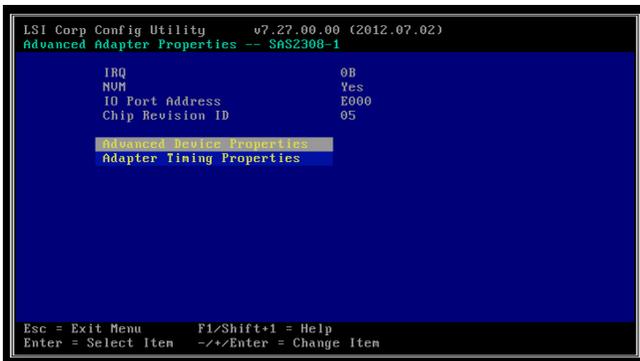
The SAS Topology submenu provides information on the following items. Select an item and press <Enter> to display information.

 **Note:** Use the right arrow key to scroll and view additional items.

- **Device Identifier:** This column displays the type of device detected. Select *Direct Attach Devices* and press <Enter> to display information on all physical disk drives installed in the system.
- **Device Info:** This column indicates if the device is SAS or SATA. It also indicates if the device has been selected as the Boot Device and if the device is a hot spare.
- **Negotiated Link Speed:** This column displays the negotiated link speed for this Phy or if it is disabled.
- **Maximum Link Speed:** This column displays the maximum hardware link rate possible for this Phy.

3-3 Advanced Adapter Properties

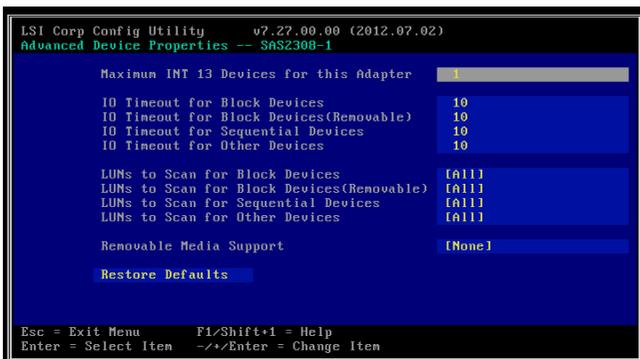
From the LSI configuration utility main page (page 2-2), select **Advanced Adapter Properties** and press <Enter> to display the submenu shown below.



Advanced Adapter Properties Submenu

Advanced Device Properties

Select **Advanced Device Properties** from the Advanced Adapter Properties submenu and press <Enter> to display the screen shown below.



Advanced Device Properties Submenu

Use the arrow keys to select any of the following items:

- Maximum INT 13 Devices for this Adapter:** This field displays the maximum amount of devices (attached to the adapter) for which you can install a pre-OS IO interface. The amount ranges from 0 to 24 devices.

- **IO Timeout for [selected] Devices:** This field displays the time (in seconds) which the host uses to timeout IOs for the following device types. The default setting is 10.
 - 00h (Direct Access)
 - 01h (Sequential Access)
 - 04h (Write Once)
 - 07h (Optical)
 - 0Eh (Simplified Direct Access)

- **LUNs to scan for [selected] Devices:** Use this field to control the LUN scan for the following types of devices. The default setting is All:
 - 00h (Direct Access)
 - 01h (Sequential Access)
 - 04h (Write Once)
 - 05h (CD-ROM)
 - 07h (Optical)
 - 0Eh (Simplified Direct Access)

Use the arrow keys to navigate to the desired item and press the <+> or <-> key to change the setting. Select **LUN 0 Only** to scan only LUN 0. Select **All** to scan all LUNs.

- **Removable Media Support:** Use this field to select the desired boot support (INT 13h interface installation) for Direct Access Removable Media devices. The default setting is None. Press the <+> or <-> key to select one of the following settings:
 - Select **None** for no boot support (no INT 13h interface installation) even if the device is selected as a first boot device or is first in the scan order.
 - Select **Boot Device Only** to provide boot support (INT 13h interface installation) only if the device is selected as the boot device.
 - Select **With Media Installed** to provide boot support (INT 13h interface installation) only if the device has media installed.

- **Restore Defaults:** Use this feature to restore all the above settings to the factory defaults.

Adapter Timing Properties

Select **Adapter Timing Properties** from the Advanced Adapter Properties submenu and press <Enter> to display the screen shown below.



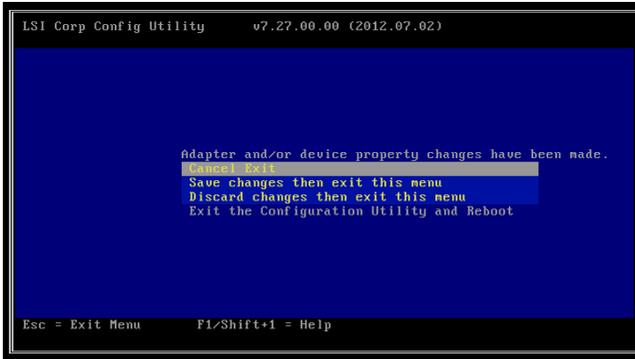
Adapter Timing Properties Submenu

Use the arrow keys to select one of the following items and press the <+> or <-> key to change the setting.

- **Direct Attached Spinup Delay:** Use this field to specify the number of seconds to wait between spinups of devices. For this setting to work properly, the device must be configured to require a spinup.
- **Direct Attached Max Targets to Spinup:** Use this field to specify the maximum number of targets that can spin up simultaneously.
- **Report Device missing Delay:** Use this field to specify the number of seconds the IO will delay reporting a target device missing after it becomes unavailable. The device will not be reported as missing if it returns before this timer expires.
- **IO Device Missing Delay:** Use this field to specify the number of seconds the IOC will delay replying to SCSI Initiator request messages when the addressed device is missing because the target device is not accessible.

3-4 Exit

After you've changed SAS RAID Configuration settings, press <Esc> to access the Exit menu as shown below.



Exit Menu

- **Cancel Exit:** Use this option to abort exiting and return to the LSI Configuration Utility.
- **Save changes then exit this menu:** Select this option to save the changes you've made and return to the LSI Configuration Utility.
- **Discard changes then exit this menu:** Select this option to discard the changes you've made and return to the LSI Configuration Utility.
- **Exit the Configuration Utility and Reboot:** Select this option to exit the LSI Configuration Utility and reboot the system.

Notes

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