PIKE 1064E/1068E

LSISAS RAID card

User Guide

E3846

First Edition V1
June 2008

Contents

Chapter 1:   Product introduction

Chapter 2:   RAID configuration

Chapter 3:   Driver installation

About this guide

This user guide contains the information you need when installing and configuring the server management board.

How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**

    This chapter offers the PIKE 1064E/1068E SAS RAID card features and the new technologies it supports.

- **Chapter 2: RAID configuration**

    This chapter provides instructions on setting up, creating, and configuring RAID sets using the available utilities.

- **Chapter 3: Driver installation**

    This chapter provides instructions for installing the RAID drivers on different operating systems.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

    The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

    Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.
	Example: <Enter> means that you must press the Enter or Return key.
<Key1+Key2+Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).
	Example: <Ctrl+Alt+D>
Command	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.
	Example: At the DOS prompt, type the command line: **format a:**

PIKE 1064E/1068E specifications summary

Controller	PIKE 1064E: LSISAS1064E PIKE 1068E: LSISAS1068E
Interface	ASUS PIKE interface
Ports	PIKE 1064E: 4 ports PIKE 1068E: 8 ports
Support device	SAS and SATA II devices
Data transfer rate	SATA II and SAS 3 Gb/s per PHY
RAID level	RAID0/RAID1/RAID1E
OS support*	Windows® Server 2003/2000/XP/Vista Red Hat® Enterprise Linux 3/4/5 SUSE Linux Enterprise Server 8/9/10 LSI MegaRAID Storage Manager (MSM) for Windows®/ Linux operating systems
Form factor	6.44 in x 1.57 in (1U compatible)

* The exact OS support would base on the OS support list of the motherboard.

** Specifications are subject to change without notice.

This chapter offers the PIKE 1064E/1068E
SAS RAID card features and the new
technologies it supports.

Product
introduction

1.1   Welcome!

Thank you for buying an ASUS® PIKE 1064E/1068E SAS RAID card!

The ASUS PIKE 1064E/1068E allows you to create RAID0, RAID1, and RAID1E set(s) from SAS hard disk drives connected to the SAS connectors on the motherboard.

Before you start installing the RAID card, check the items in your package with the list below.

1.2   Package contents

Check your package for the following items.

- ASUS PIKE 1064E/1068E SAS RAID card
- Support CD
- User guide

If any of the above items is damaged or missing, contact your retailer.

1.3　Card layout

The illustration below shows the major components of the RAID card.

1.　ASUS PIKE interface-1: PCI-E x8
2.　ASUS PIKE interface-2: 4-port SAS signal with SGPIO interface (PIKE 1064E)
　　　　　　　　　　　　　　　8-port SAS signal with SGPIO interface (PIKE 1068E)*
3.　SAS RAID card status LED (lights up and blinks to indicate that the card is working normally)

- *The SGPIO interface is used for visibility into drive activity, failure and rebuild status, so that users could build high-performatnce and reliable storage systems. Refer to the motherboard manual for detailed information about using the SGPIO connectors on the motherboard.

- For PIKE 1068E SAS RAID card, a heatsink is installed on the LSISAS1068E controller.

1.4　System requirements

Before you install the PIKE 1064E/1068E SAS RAID card, check if the system meets the following requirements:

- **Workstation or server motherboard with a PIKE RAID card slot**
- **SAS or SATA hard disk drives**
- **Supporting operating system:**

  Windows® and Linux operating systems (refer to website for details)

- **Other requirement:**

  - Appropriate thermal solution

  - Certified power supply module

1.5 Card installation

Follow below instructions to install the RAID card on your motherboard.

1. Locate the PIKE RAID card slot on the motherboard.
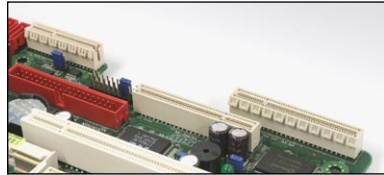
2. Align the golden fingers of the RAID card with the PIKE RAID card slot.
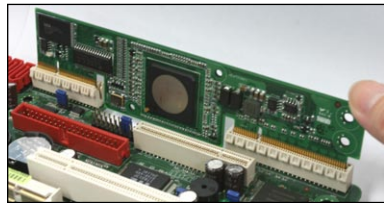
3. Insert the RAID card into the PIKE RAID card slot. Make sure it's completely inserted into the PIKE RAID card slot.
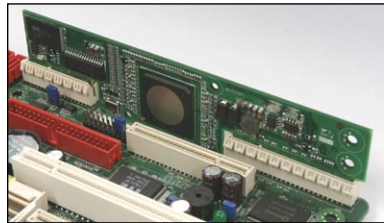
Connect the SAS hard disk drives to SAS connectors 1-4 (red) on the motherboard when using a 4-port PIKE RAID card. The SAS connectors 5-8 (blue) function when using a 8-port PIKE RAID card.

This chapter provides instructions on setting up, creating, and configuring RAID sets using the available utilities.

RAID configuration

2

2.1 Setting up RAID

The RAID card supports RAID 0, RAID 1 and RAID 1E set.

2.1.1 RAID definitions

RAID 0 *(Data striping)* optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of at least two new identical hard disk drives is required for this setup.

RAID 1 *(Data mirroring)* copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 1E *(Enhanced RAID 1)* has a striped layout with each stripe unit having a secondary (or alternate) copy stored on a different disk. You can use three or more hard disk drives for this configuration.

> If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support CD to a floppy disk before you install an operating system to the selected hard disk drive.

2.1.2 Installing hard disk drives

The RAID card supports SAS for RAID set configuration. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SAS hard disks for RAID configuration:

1. Install the SAS hard disks into the drive bays following the instructions in the system user guide.
2. Connect a SAS signal cable to the signal connector at the back of each drive and to the SAS connector on the motherboard.
3. Connect a power cable to the power connector on each drive.

2.2 LSI Corporation MPT Setup Utility

The LSI Corporation MPT Setup Utility is an integrated RAID solution that allows you to create the following RAID set(s) from SAS hard disk drives supported by the LSI SAS 1064E/1068E controller:

- RAID 1 (Integrated Mirroring)
- RAID 1E (Integrated Mirroring Enhanced)
- RAID 0 (Integrated Striping)

- You may use disks of different sizes in IM and IME volumes; however, the size of the smallest disk determines the "logical" size of each member disk.

- DO NOT combine Serial ATA and SAS disk drives in one volume.

- The RAID setup screens shown in this section are for reference only and may not exactly match the items on your screen due to the controller version difference.

- The adapter name shown on the setup screens differs according to the installed SAS RAID card.

- Before requesting support from the ASUS Technical Support team, you have to take note of the MPTFW and MPTBIOS version for the SAS RAID card. After entering the SAS configuration utility, you can see below screen and identify the MPTFW and MPTBIOS version:
  MPTFW version: 1.24.00.00-IR
  MPTBIOS version: v6.20.00.00 (2007.12.04)

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter List  Global Properties

Adapter     PCI   PCI   PCI   PCI   FW Revision      Status      Boot
            BUS   Dev   Fnc   Slot                               Order
SAS1064E    02    00    00    20    1.24.00.00-IR    Enabled     0




                 




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

2.2.1   Integrated Mirroring volume

The Integrated Mirroring (IM) feature supports simultaneous mirrored volumes with two disks (IM).

The IM feature supports hot swap capability, so when a disk in an IM volume fails, you can easily restore the volume, and the swapped disk is automatically re-mirrored.

To create an IM volume:

1.   Turn on the system after installing all SAS hard disk drives.
2.   During POST, press <Ctrl+C> to enter the SAS configuration utility.

```
LSI Corporation MPT SAS BIOS
MPTBIOS-6.20.00.00 (2007.12.04)
Copyright 2000-2007 LSI Corporation.

Press Ctrl-C to start LSI Corp Configuration Utility...
```

To avoid data loss, do not turn off the system when rebuilding.

3.   The following screen appears. Select a channel and press <Enter> to enter the setup.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
Adapter List  Global Properties
Adapter     PCI   PCI   PCI   PCI   FW Revision      Status      Boot
            BUS   Dev   Fnc   Slot                               Order
SAS1064E    02    00    00    20    1.24.00.00-IR    Enabled     0




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

The numbers of the channel depend on the controller.

4.   The **Adapter Properties** screen appears.
     Use the arrow keys to select **RAID Properties**, then press <Enter>.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter Properties -- SAS1064E

        Adapter                    SAS1064E
        PCI Slot                   20
        PCI Address(Bus/Dev/Func)  02:00:00
        MPT Firmware Revision      1.24.00.00-IR
        SAS Address                500E0188:01111705
        NVDATA Version             2D.02
        Status                     Enabled
        Boot Order                 0
        Boot Support               [Enabled BIOS & OS]

        RAID Properties

        SAS Topology

        Advanced Adapter Properties


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

5.   The **Select New Array Type** screen appears.
     Use the arrow keys to select **Create IM Volume**, then press <Enter>.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Select New Array Type -- SAS1064E

     Create IM Volume         Create Integrated Mirror Array of 2
                              disks plus up to 2 optional hot spares.
                              Data on the primary disk may be migrated.

     Create IME Volume        Create Integrated Mirrored Enhanced
                              Array of 3 to 10 disks including up
                              to 2 optional hot spares.
                              ALL DATA on array disks will be DELETED!

     Create IS Volume         Create Integrated Striping array of
                              2 to 10 disks.
                              ALL DATA on array disks will be DELETED!

Esc = Exit Menu       F1/Shift+1 = Help
Enter = Choose array type to create
```

6.   The **Create New Array** screen shows the disks you can add to make up the IM
      volume. Use the arrow key to select a disk, then move the cursor to the **RAID
      Disk** column. To include this disk in the array, press <+>, <->, or <Space>.

      You may also specify the Hot Spare disk here. Select the disk, then move the
      cursor to the **Hot Spr** column, then press <+>, <->, or <Space>.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Create New Array -- SAS1064E

  Array Type:                    IM
  Array Size(MB):                ------

Slot    Device Identifier              RAID  Hot   Drive    Pred   Size
Num                                    Disk  Spr   Status   Fail   (MB)
  0     SEAGATE ST336754SS     0003    [No]  [No]  -------  ----   35003
  1     SEAGATE ST336754SS     0003    [No]  [No]  -------  ----   35003
  2     SEAGATE ST336754SS     0003    [No]  [No]  -------  ----   35003
  3     SEAGATE ST336754SS     0003    [No]  [No]  -------  ----   35003




Esc = Exit Menu   F1/Shift+1 = Help
SPACE/+/- = Select disk for array or hot spare   C = Create array
```

By default, the **RAID Disk** field shows **No** before array creation. This field is
grayed out under the following conditions:

·   The disk does not meet the minimum requirements for use in a RAID array.

·   The disk is not large enough to mirror existing data on the primary drive.

·   The disk has been selected as the Hot Spare for the RAID array.

·   The disk is already part of another array.

7.   A confirmation screen appears.

Press <M> to keep existing data on the first disk. If you choose this option, data on the first disk will be mirrored on the second disk that you will add to the volume later. Make sure the data you want to mirror is on the first disk.

Press <D> to overwrite any data and create the new IM array.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Create New Array -- SAS1064E


    M  - Keep existing data, migrate to an IM array.
         Synchronization of disk will occur.

    D  - Overwrite existing data, create a new IM array.
         ALL DATA on ALL disk in the array will be DELETED!!
         No Synchronization performed.




Esc = Exit Menu        F1/Shift+1 = Help
Space/+/- = Select disk for array or hot spare   C = Create array
```

8.   Repeat steps 5 and 6 to add the second disk to the volume.

9.   When done, press <C> to create the array, then select **Save changes then exit this menu**.

```
Create and save new array?
 Cancel Exit
 Save changes then exit this menu
 Discard changes then exit this menu
 Exit the Configuration Utility and Reboot
```

10. The utility creates the array.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)

Processing...may take up to 1 minute
Creating RAID Array...
```

2.2.2   Integrated Mirroring Enhanced volume

The Integrated Mirroring Enhanced (IME) supports three to ten disks, or seven mirrored disks plus two hot spare disks.

To create an IME volume:

1.   Follow steps 1–4 of the section **Integrated Mirroring volume**.

2.   The **Select New Array Type** screen appears.
      Use the arrow keys to select **Create IME Volume**, then press <Enter>.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
Select New Array Type -- SAS1064E


        Create IM Volume          Create Integrated Mirror Array of 2
                                  disks plus up to 2 optional hot spares.
                                  Data on the primary disk may be migrated.


        Create IME Volume         Create Integrated Mirrored Enhanced
                                  Array of 3 to 10 disks including up
                                  to 2 optional hot spares.
                                  ALL Data on array disks will be deleted!


        Create IS Volume          Create Integrated Striping array of
                                  2 to 10 disks.
                                  ALL Data on array disks will be deleted!


Esc = Exit Menu      F1/Shift+1 = Help
Enter = Choose array type to create
```

3.   The **Create New Array** screen shows the disks you can add to make up the IME volume.

      Integrated Mirroring Enhanced (IME) supports three to ten disks, or seven mirrored disks plus two hot spare disks. Use the arrow key to select a disk, then move the cursor to the **RAID Disk** column. To include this disk in the array, press <+>, <->, or <Space>.

      You may also specify the Hot Spare disk here. Select the disk, then move the cursor to the **Hot Spr** column, then press <+>, <->, or <Space>.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
Create New Array -- SAS1064E
   Array Type:                    IME
   Array Size(MB):                51498

Slot    Device Identifier          RAID   Hot   Drive    Pred   Size
Num                                Disk   Spr   Status   Fail   (MB)
  0     SEAGATE ST336754SS   0003  [Yes]  [No]  -------  ----    35003
  1     SEAGATE ST336754SS   0003  [No]   [No]  -------  ----    35003
  2     SEAGATE ST336754SS   0003  [Yes]  [No]  -------  ----    35003
  3     SEAGATE ST336754SS   0003  [Yes]  [No]  -------  ----    35003




Esc = Exit Menu   F1/Shift+1 = Help
SPACE/+/- = Select disk for array or hot spare   C = Create array
```

By default, the **RAID Disk** field shows **No** before array creation. This field is grayed out under the following conditions:

- The disk does not meet the minimum requirements for use in a RAID array.
- The disk is not large enough to mirror existing data on the primary drive.
- The disk has been selected as the Hot Spare for the RAID array.
- The disk is already part of another array.

4. Repeat step 3 to add the other disks to the volume.

5. When done, press <C> to create the array, then select **Save changes then exit this menu**.

```
Create and save new array?
 Cancel Exit
 Save changes then exit this menu
 Discard changes then exit this menu
 Exit the Configuration Utility and Reboot
```

6. The utility creates the array.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)

Processing...may take up to 1 minute
Creating RAID Array...
```
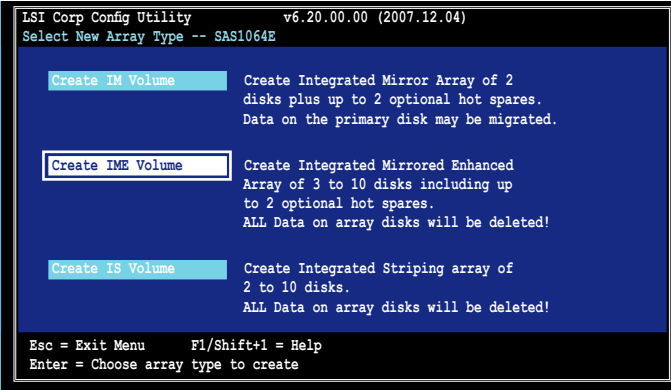
2.2.3　Integrated Striping (IS) volume

The Integrated Striping (IS) feature provides RAID 0 functionality, supporting volumes with two to ten disks. You may combine an IS volume with an IM or IME volume.
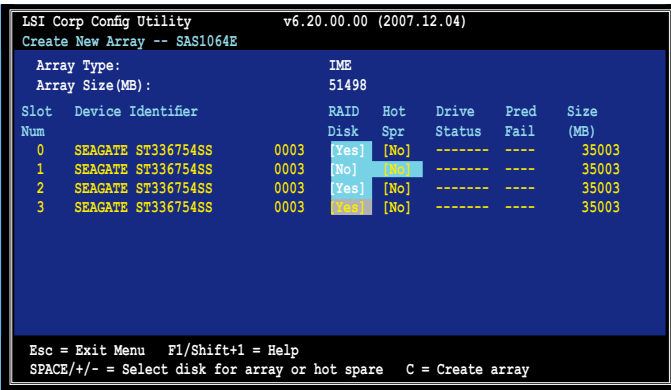
To create an IS volume:

1.　Follow steps 1–4 of the section **Integrated Mirroring volume**.

2.　The **Select New Array Type** screen appears.
　　Use the arrow keys to select **Create IS Volume**, then press <Enter>.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Select New Array Type -- SAS1064E


    Create IM Volume          Create Integrated Mirror Array of 2
                              disks plus up to 2 optional hot spares.
                              Data on the primary disk may be migrated.


    Create IME Volume         Create Integrated Mirrored Enhanced
                              Array of 3 to 10 disks including up
                              to 2 optional hot spares.
                              ALL DATA on array disks will be DELETED!


    Create IS Volume          Create Integrated Striping array of
                              2 to 10 disks.
                              ALL DATA on array disks will be DELETED!

  Esc = Exit Menu      F1/Shift+1 = Help
  Enter = Choose array type to create
```

3.　The **Create New Array** screen shows the disks you can add to make up the IS volume. Use the arrow key to select a disk, then move the cursor to the **RAID Disk** column. To include this disk in the array, press <+>, <->, or <Space>.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Create New Array -- SAS1064E

  Array Type:                     IS
  Array Size(MB):                 102996

Slot   Device Identifier          RAID   Hot   Drive     Pred   Size
Num                               Disk   Spr   Status    Fail   (MB)
  0    SEAGATE ST336754SS   0003  [Yes]  [No]  -------   ----   35003
  1    SEAGATE ST336754SS   0003  [No]   [No]  -------   ----   35003
  2    SEAGATE ST336754SS   0003  [Yes]  [No]  -------   ----   35003
  3    SEAGATE ST336754SS   0003  [Yes]  [No]  -------   ----   35003




  Esc = Exit Menu    F1/Shift+1 = Help
  SPACE/+/- = Select disk for array or hot spare   C = Create array
```
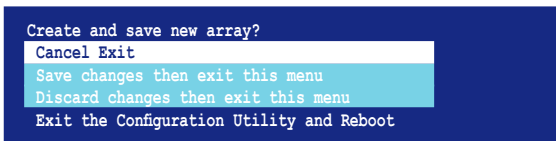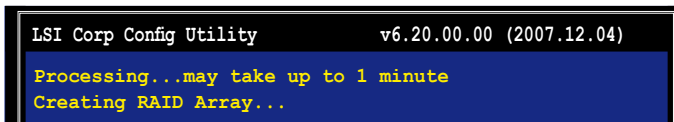
By default, the **RAID Disk** field shows **No** before array creation. This field is grayed out under the following conditions:

- The disk does not meet the minimum requirements for use in a RAID array.
- The disk is not large enough to mirror existing data on the primary drive.
- The disk has been selected as the Hot Spare for the RAID array.
- The disk is already part of another array.

4. Repeat step 3 to add the other disks to the volume.

5. When done, press <C> to create the array, then select **Save changes then exit this menu**.

```
Create and save new array?
Cancel Exit
Save changes then exit this menu
Discard changes then exit this menu
Exit the Configuration Utility and Reboot
```

6. The utility creates the array.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)

Processing...may take up to 1 minute
Creating RAID Array...
```

2.2.4 Managing Arrays
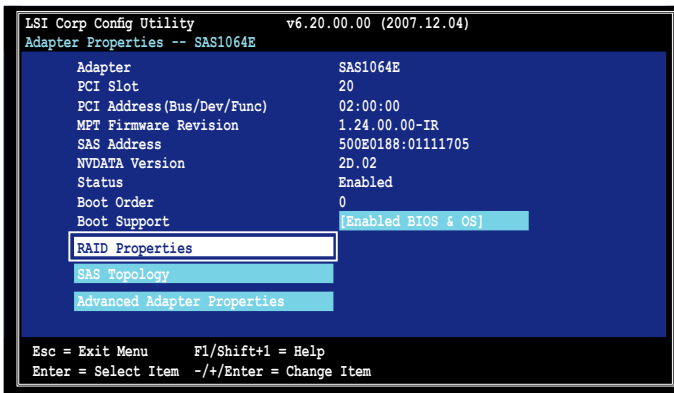
The LSI Corporation MPT Setup Utility allows you to perform other tasks related to configuring and maintaining IM and IME volumes.

Refer to this section to view volume properties, manage the hot spare disk, synchronize the array, activate the array, and delete the array.

Viewing volume properties

To view volume properties:

1. On the main menu, select **RAID Properties**.
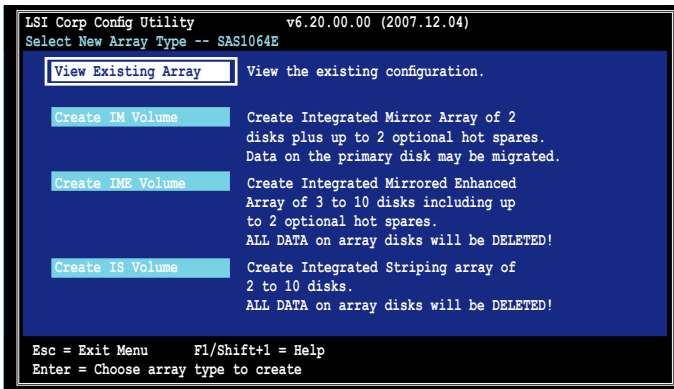
```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter Properties -- SAS1064E

        Adapter                     SAS1064E
        PCI Slot                    20
        PCI Address(Bus/Dev/Func)   02:00:00
        MPT Firmware Revision       1.24.00.00-IR
        SAS Address                 500E0188:01111705
        NVDATA Version              2D.02
        Status                      Enabled
        Boot Order                  0
        Boot Support                [Enabled BIOS & OS]

        RAID Properties

        SAS Topology

        Advanced Adapter Properties


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

2. On the next screen that appears, select **View Existing Array**.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Select New Array Type -- SAS1064E

        View Existing Array      View the existing configuration.

        Create IM Volume         Create Integrated Mirror Array of 2
                                 disks plus up to 2 optional hot spares.
                                 Data on the primary disk may be migrated.

        Create IME Volume        Create Integrated Mirrored Enhanced
                                 Array of 3 to 10 disks including up
                                 to 2 optional hot spares.
                                 ALL DATA on array disks will be DELETED!

        Create IS Volume         Create Integrated Striping array of
                                 2 to 10 disks.
                                 ALL DATA on array disks will be DELETED!


Esc = Exit Menu      F1/Shift+1 = Help
Enter = Choose array type to create
```

3. The **View Array** screen appears. Here you can view properties of the RAID array(s) created. If you have configured a hot spare, it will also be listed. If you created more than one array, you may view the next array by pressing <Alt+N>.

```
 LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
 View Array -- SAS1064E
       Array                 1 of 1
       Identifier            LSILOGICLogical Volume  3000
       Type                  IME
       Scan Order            0
       Size(MB)              51498
       Status                Optimal

       Manage Array

 Slot   Device Identifier          RAID  Hot   Drive    Pred   Size
 Num                               Disk  Spr   Status   Fail   (MB)
   0    SEAGATE ST336754SS   0003  Yes   No    Ok       No     34331
   2    SEAGATE ST336754SS   0003  Yes   No    Ok       No     34331
   3    SEAGATE ST336754SS   0003  Yes   No    Ok       No     34331

 Esc = Exit Menu       F1/Shift+1 = Help
 Enter=Select Item   Alt+N=Next Array   C = Create an array   R = Refresh Display
```

Managing hot spares

You may configure one disk as a global hot spare to protect critical data on the IM/IME volume(s). You may create the hot spare disk at the same time you create the IM/IME volume. Refer to this section when adding a hot spare disk on an existing volume.

If a disk on an IM/IME volume fails, the utility automatically rebuilds the failed disk data on the hot spare. When the failed disk is replaced, the utility assigns the replacement as the new hot spare.

To create a hot spare:

1.   Follow steps 1–3 of the section **Viewing volume properties**.
2.   From the **View Array** screen, select **Manage Array**, then press <Enter>.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
View Array -- SAS1064E
         Array                    1 of 1
         Identifier               LSILOGICLogical Volume  3000
         Type                     IME
         Scan Order               0
         Size(MB)                 51498
         Status                   Optimal

    ┌──────────────────────────────────┐
    │ Manage Array                     │
    └──────────────────────────────────┘

Slot   Device Identifier            RAID   Hot   Drive   Pred   Size
Num                                 Disk   Spr   Status  Fail   (MB)
  0    SEAGATE ST336754SS    0003   Yes    No    Ok      No     34331
  2    SEAGATE ST336754SS    0003   Yes    No    Ok      No     34331
  3    SEAGATE ST336754SS    0003   Yes    No    Ok      No     34331

 Esc = Exit Menu        F1/Shift+1 = Help
 Enter=Select Item   Alt+N=Next Array   C = Create an array
```

3.   From the **Manage Array** screen, select **Manage Hot Spares**, then press <Enter>.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
Manage Array -- SAS1064E
         Identifier               LSILOGICLogical Volume  3000
         Type                     IME
         Scan Order               0
         Size(MB)                 51498
         Status                   Optimal

    ┌──────────────────────────────────┐
    │ Manage Hot Spares                │
    └──────────────────────────────────┘

      Synnchronize Array

      Activate Array

      Delete Array

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

4. Use the arrow key to select the disk you would like to configure as hot spare, then move the cursor to the **Hot Spr** column. Press <+>, <->, or <Space>. The **Drive Status** column field now shows **Hot Spare**.

Press <C> to commit the changes.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
Manage Hot Spare -- SAS1064E
        Identifier            LSILOGICLogical Volume  3000
        Type                  IME
        Scan Order            0
        Size(MB)              51498
        Status                Optimal

Slot   Device Identifier           Hot   Drive       Pred   Size
Num                                Spr   Status      Fail   (MB)
 0     SEAGATE ST33675488   0003   [No]  Ok          No      34331
 1     SEAGATE ST336754SS   0003   [No]  Ok          No      34331
 2     SEAGATE ST336754SS   0003   [No]  Ok          No      34331
 3     SEAGATE ST336754SS   0003   [Yes] Hot Spare   No      35003
                                   [----] ---------  --      -----


 Esc = Exit Menu    F1/Shift+1 = Help
 SPACE/+/- = Change Item          C = Commit Changes
```

Synchronizing the array

Synchronizing the array allows the utility to resynchronize data on the mirrored disk in the array. This procedure is seldom required because data synchronization is automatically done during normal operation.

To synchronize the array:

1. Follow steps 1–3 of the section **Viewing volume properties** and step 2 of the section **Managing hot spares**.

2. From the **Manage Array** screen select **Synchronize Array**, then press <Enter>.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
Manage Array -- SAS1064E
        Identifier            LSILOGICLogical Volume  3000
        Type                  IME
        Scan Order            0
        Size(MB)              51498
        Status                Optimal

    Manage Hot Spare

    Synnchronize Array

    Activate Array

    Delete Array


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

3. Press <Y> to begin the synchronization, or <N> to cancel.

Activating an array

If an array is removed from one controller/computer or moved to another, the array is considered inactive. When you add the array back to the system, you may reactivate the array.

To activate the array:

1. From the **Manage Array** screen, select **Activate Array**, then press <Enter>.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
Manage Array -- SAS1064E
        Identifier              LSILOGICLogical Volume  3000
        Type                    IME
        Scan Order              0
        Size(MB)                51498
        Status                  Inactive

        Manage Hot Spare

        Synnchronize Array

        Activate Array

        Delete Array


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

2. Press <Y> to activate, or <N> to cancel.

Deleting an array

- You cannot recover lost data if you delete an array. Make sure you back up important data before deleting an array.

- If you delete an IM (RAID 1) volume, the data is preserved on the primary disk.

To delete an array:

1. From the **Manage Array** screen, select **Delete Array**, then press <Enter>.

```
LSI Corp Config Utility              v6.20.00.00 (2007.12.04)
Manage Array -- SAS1064E
        Identifier              LSILOGICLogical Volume  3000
        Type                    IM
        Scan Order              0
        Size(MB)                34332
        Status                  Optimal

        Manage Hot Spare

        Synnchronize Array

        Activate Array

        Delete Array


Esc = Exit Menu           F1/Shift+1 = Help
Enter = Select Item
```
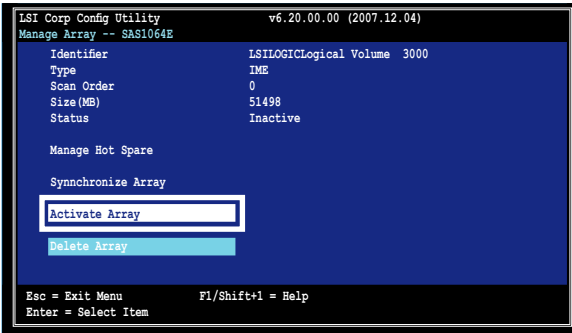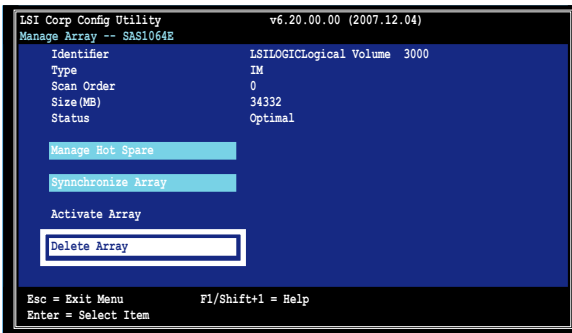
2. Press <Y> to delete, or <N> to cancel.

2.2.5   Viewing SAS topology

1.   From the **Adapter Properties** screen, select **SAS Topology**.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter Properties -- SAS1064E

        Adapter                  SAS1064E
        PCI Slot                 20
        PCI Address(Bus/Dev/Func)  02:00:00
        MPT Firmware Revision    1.24.00.00-IR
        SAS Address              500E0188:01111705
        NVDATA Version           2D.02
        Status                   Enabled
        Boot Order               0
        Boot Support             [Enabled BIOS & OS]

        RAID Properties

        SAS Topology

        Advanced Adapter Properties


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

Press <Alt+D> to display device properties, or <Alt+M> to display more keys.

```
More keys for the SAS Topology display:

C = Clear Device Mappings for Non-Present Devices
R = Refresh SAS Topology
Enter = On a SAS Enclosure or Expander - Expand or Collapse Item
Enter = On a Disk Drive - Turn on the Locate LED (next key press turns off)
```

2.   Information about the volume and its member-disks are then displayed.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
SAS Topology -- SAS1064E

                   Device Identifier               Device
SAS1064E(02:00:00)                                 Info
├─ Enclosure        Direct Attach Devices          Controller
└─ IM VOL           LSILOGICLogical Volume 3000









Esc = Exit    F1/Shift+1 = Help
Alt+D = Device Properties    Alt+M = More Keys
```

2.2.6 Global Properties

From the **Adapter List** screen, press <Alt+N> to enter **Global Properties** menu. From the menu you may change related settings.

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter List  Global Properties
Adapter     PCI   PCI   PCI   PCI   FW Revision      Status    Boot
            BUS   Dev   Fnc   Slot                             Order
SAS1064E    02    00    00    20    1.24.00.00-IR    Enabled   0




















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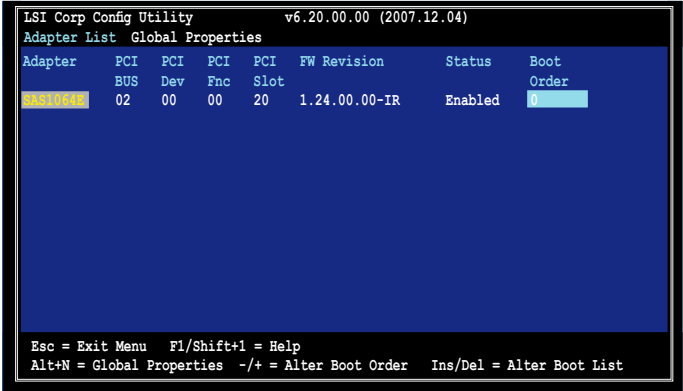
Pause When Boot Alert Displayed

Sets whether to pause or not when the boot alert displays.
Configuration options: [Yes] [No]

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter List  Global Properties


    Pause When Boot Alert Displayed    [No]
    Boot Information Display Mode       [Display adapters & installed devices]
    Support Interrupt                  [Hook interrupt, the Default]

    Restore Defaults








Esc = Exit Menu        F1/Shift+1 = Help
Alt+N = Adapter List  -/+ = Change Item
```
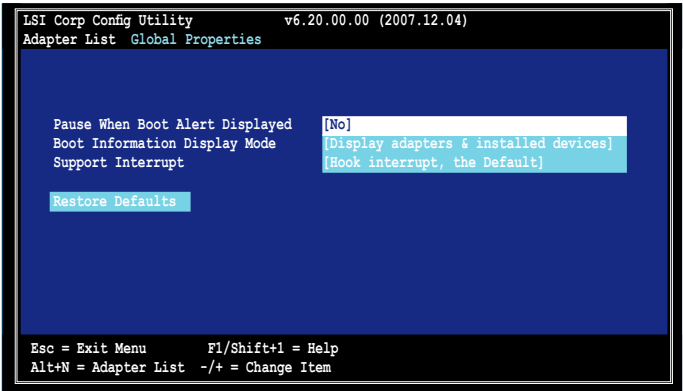
Boot Information Display Mode

Sets the disk information display mode.
Configuration options: [Display adapters & installed devices]
[Display adapters only] [Display adapters and all devices]
[Display minimal information]

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter List  Global Properties



    Pause When Boot Alert Displayed    [No]
    Boot Information Display Mode       [Display adapters & installed devices]
    Support Interrupt                  [Hook interrupt, the Default]

    Restore Defaults





Esc = Exit Menu        F1/Shift+1 = Help
Alt+N = Adapter List   -/+ = Change Item
```
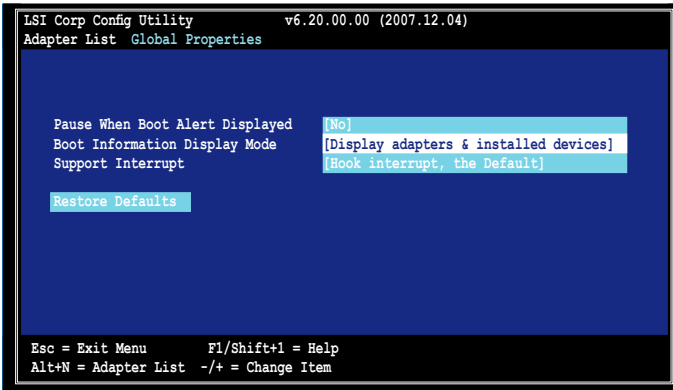
Support Interrupt

Configuration options: [Hook interrupt, the Default] [Bypass interrupt hook]

```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter List  Global Properties



    Pause When Boot Alert Displayed    [No]
    Boot Information Display Mode       [Display adapters & installed devices]
    Support Interrupt                  [Hook interrupt, the Default]

    Restore Defaults





Esc = Exit Menu        F1/Shift+1 = Help
Alt+N = Adapter List   -/+ = Change Item
```
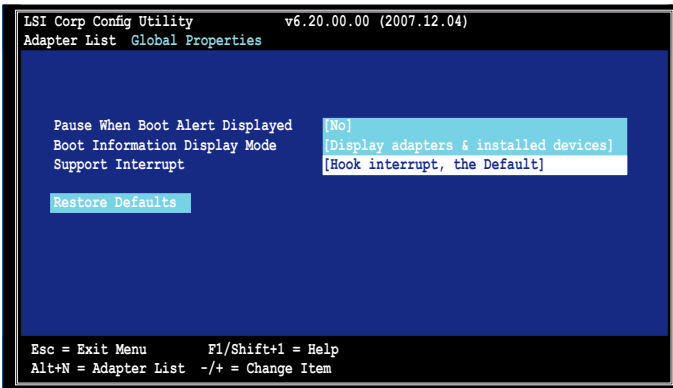
Restore Defaults

This option allows you to discard the selections you made and restore the system defaults.
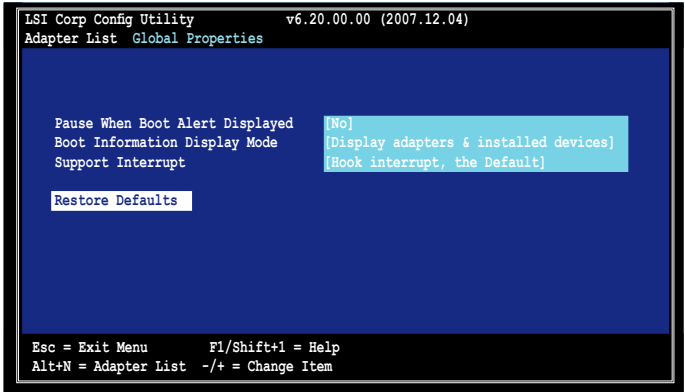
```
LSI Corp Config Utility          v6.20.00.00 (2007.12.04)
Adapter List  Global Properties



    Pause When Boot Alert Displayed    [No]
    Boot Information Display Mode       [Display adapters & installed devices]
    Support Interrupt                  [Hook interrupt, the Default]

    Restore Defaults





Esc = Exit Menu        F1/Shift+1 = Help
Alt+N = Adapter List  -/+ = Change Item
```

This chapter provides instructions for installing the RAID drivers on different operating systems.

3
Driver installation

3.1 RAID driver installation

After creating the RAID sets for your server system, you are now ready to install an operating system to the independent hard disk drive or bootable array. This part provides instructions on how to install or update the RAID card drivers.

> The RAID card driver might be included in the Linux OS installation CD, and could be loaded automatically during OS installation. However, we recommend using the RAID driver packaged in the RAID card support CD for better reliability.

3.1.1 Creating a RAID driver disk

> You may have to use another system to create the RAID driver disk from the RAID card support CD or from the Internet.

A floppy disk with the RAID driver is required when installing Windows® Server 2003 or Linux operating system on a hard disk drive that is included in a RAID set. You can create a RAID driver disk in DOS (using the Makedisk application in the support CD).

To create a RAID driver disk in DOS environment:

1. Place the RAID card support CD in the optical drive.
2. Restart the computer, then enter the BIOS Setup.
3. Select the optical drive as the first boot priority to boot from the support CD. Save your changes, then exit the BIOS Setup.
4. Restart the computer.
5. Press any key when prompted to boot from CD.

```
Loading FreeDOS FAT KERNEL GO!
Press any key to boot from CDROM...
```

6. The Makedisk menu appears. Select **PIKE 1064E / PIKE 1068E SAS card Driver,** and press <Enter> to enter the sub-menu.

```
        Create Driver Diskette Menu
PIKE 1064E / PIKE 1068E SAS card Driver
FreeDOS command prompt
```
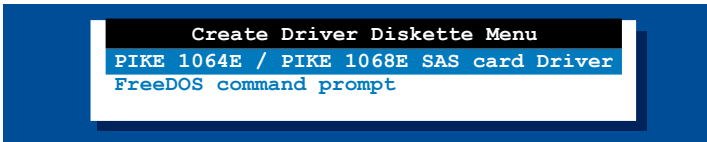
7. Use the arrow keys to select the type of RAID driver disk you want to create.

```
PIKE 1064E / PIKE 1068E SAS card Driver
Windows 2000 Server SP4
Windows XP 32 bit
Windows XP 64 bit
Windows Server 2003 32 bit
Windows Server 2003 64 bit
Windows Vista 32 bit
Windows Vista 64 bit
Windows Server 2008 32 bit
Windows Server 2008 64 bit
RHEL AS3 UP6/UP8/UP9 32 bit (Intel)
RHEL AS3 UP6/UP8/UP9 32 bit (AMD)
RHEL AS3 UP6/UP8/UP9 64 bit
RHEL AS4 UP4/UP5/UP6 32 bit
RHEL AS4 UP4/UP5/UP6 64 bit
SLES 9 32 bit
SLES 9 64 bit
SLES 9 SP1 32 bit
SLES 9 SP1 64 bit
SLES 9 SP2 32 bit
SLES 9 SP2 64 bit
SLES 9 SP3 32 bit
SLES 9 SP3 64 bit
▼
```
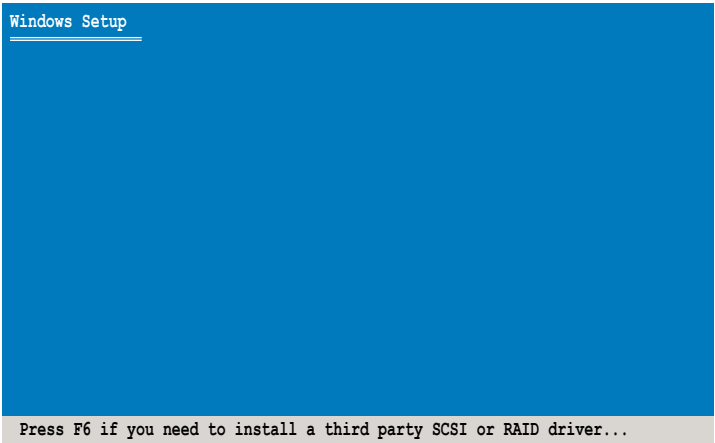
8. Place a blank, high-density floppy disk to the floppy disk drive.

9. Press <Enter>.

10. Follow screen instructions to create the driver disk.
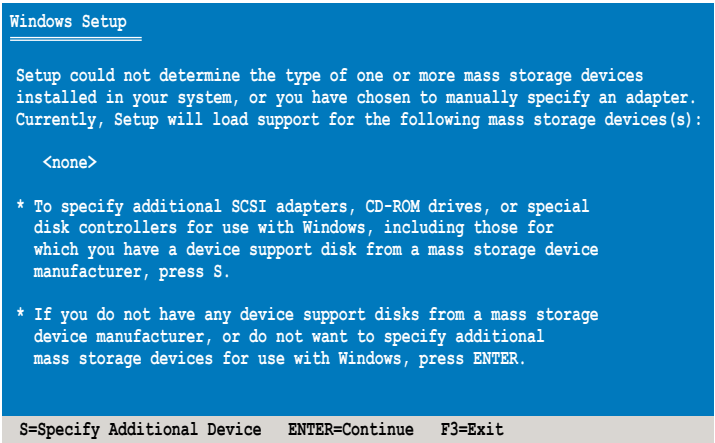
3.1.2   Windows® Server 2003 OS

During Windows® Server 2003 OS installation

To install the RAID card driver when installing Windows® Server 2003 OS:

1. Boot the computer using the Windows® Server 2003 OS installation CD. The **Window® Setup** starts.

2. Press <F6> when the message "Press F6 if you need to install a third party SCSI or RAID driver..." appears at the bottom of the screen.

```
Windows Setup
─────────────




















   Press F6 if you need to install a third party SCSI or RAID driver...
```

3. The next screen appears. Press <S> to specify an additional device.

```
Windows Setup
─────────────

 Setup could not determine the type of one or more mass storage devices
 installed in your system, or you have chosen to manually specify an adapter.
 Currently, Setup will load support for the following mass storage devices(s):

    <none>

 * To specify additional SCSI adapters, CD-ROM drives, or special
   disk controllers for use with Windows, including those for
   which you have a device support disk from a mass storage device
   manufacturer, press S.

 * If you do not have any device support disks from a mass storage
   device manufacturer, or do not want to specify additional
   mass storage devices for use with Windows, press ENTER.


  S=Specify Additional Device    ENTER=Continue    F3=Exit
```

4. Insert the RAID driver disk you created earlier to the floppy disk drive, then press <Enter>.

```
Windows Setup


                        Please insert the disk labeled

                Manufacturer-supplied hardware support disk

                              into Drive A:

                        *   Press ENTER when ready.




  ENTER=Continue    ESC=Cancel    F3=Exit
```
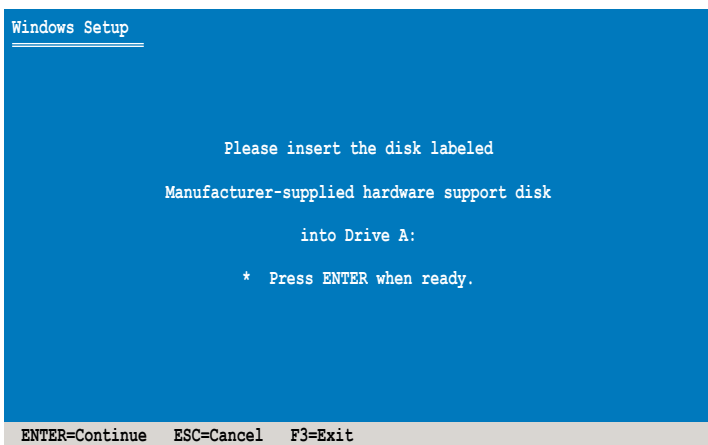
5. Select **LSI Fusion-MPT SAS Driver (Server 2003 32-bit)**, then press <Enter>.

```
Windows Setup

     You have chosen to configure a SCSI Adapter for use with Windows,
     using a device support disk provided by an adapter manufacturer.

     Select the SCSI Adapter you want from the following list, or press ESC
     to return to the previous screen.



         LSI Fusion-MPT SAS Driver (Server 2003 32-bit)



  ENTER=Select    F3=Exit
```
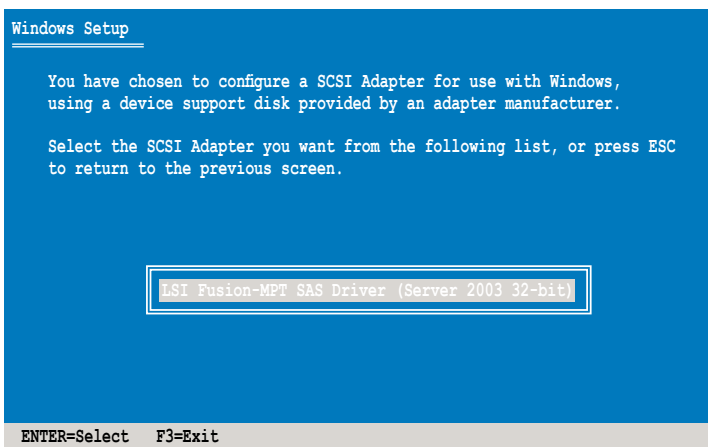
6. The Windows® Setup loads the RAID card drivers from the RAID driver disk. When next screen appears, press <Enter> to continue installation.

7. Setup then proceeds with the OS installation. Follow screen instructions to continue.

After Windows® Server 2003 OS installation

To update the RAID card driver after installing Windows® Server 2003 OS:

1. Right-click the **My Computer** icon on the desktop and select **Properties** from the menu.

2. Click the **Hardware** tab on the top, then click the **Device Manager** button.

3. Double-click the **LSI Adapter, SAS 3000 series, 4-port with 1064E -StorPort** item.

> The controller name differs according to the installed SAS RAID card.
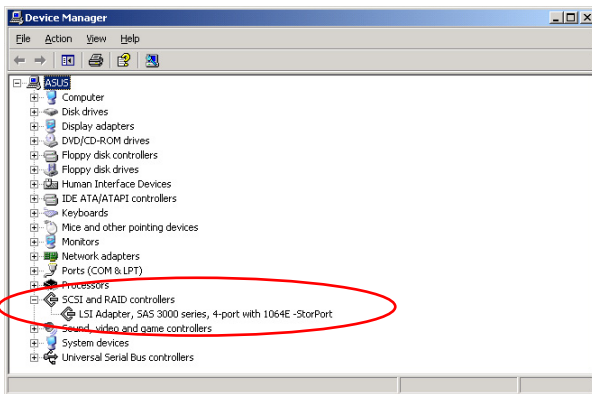
4. Click the **Driver** tab on the top, then click **Update Driver**.
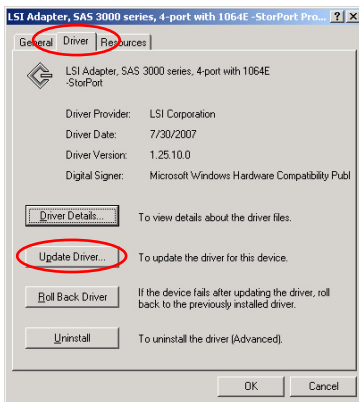
5. Toggle **Install from a list or specific location (Advanced)**, then click **Next** to continue.

6. Toggle **Don't search. I will choose the driver to install**, then click **Next** to continue.
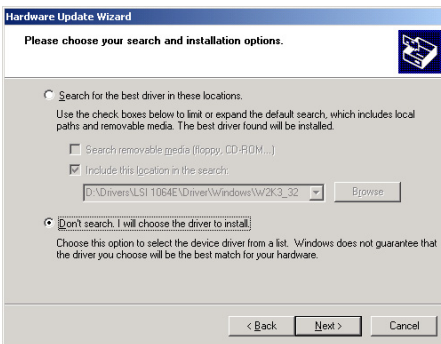
7. Insert the RAID driver disk you created earlier to the floppy disk drive.

8. Highlight **LSI Adapter, SAS 3000 series, 4-port with 1064E -StorPort**, then click **Have Disk**.
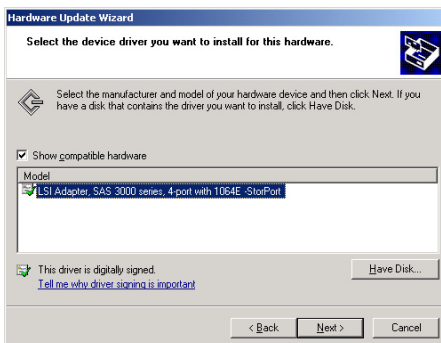
9.   Select from the drop-down menu and locate the driver.
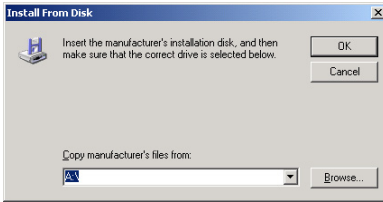
10.   Click **Next** to start updating the driver.

11.   After completing driver update, click **Finish** to close the wizard.

3.1.3   Red Hat® Enterprise Linux OS

To install the RAID card driver when installing Red Hat® Enterprise OS:

1.   Boot the system from the Red Hat® OS installation CD.

2.   At the **boot:**, type **linux dd**, then press <Enter>.

```
-  To install or upgrade in graphical mode, press the <ENTER> key.
-  To install or upgrade in text mode, type: linux text <ENTER>.
-  Use the function keys listed below for more information.
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: linux dd
```

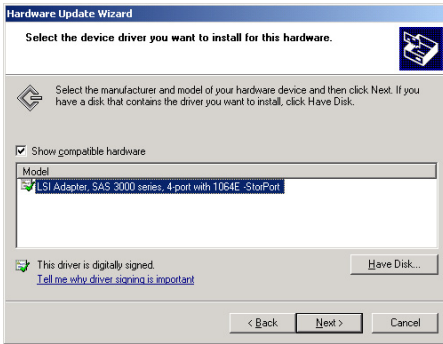3.   Select **Yes** using the <Tab> key when asked if you have the driver disk, then
      press <Enter>.

```
                    ┤ Main Menu ├

        Do you have a driver disk?


          Yes                    No

```
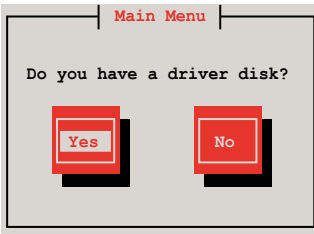
4.   Select **fd0** using the <Tab> key when asked to select the driver disk source.
      Press <Tab> to move the cursor to **OK**, then press <Enter>.

```
              ┤ Driver Disk Source ├

      You have multiple devices which could
      serve as sources for a driver disk.
      Which would you like to use?

                    fd0
                    scd0


          OK                    Cancel

```
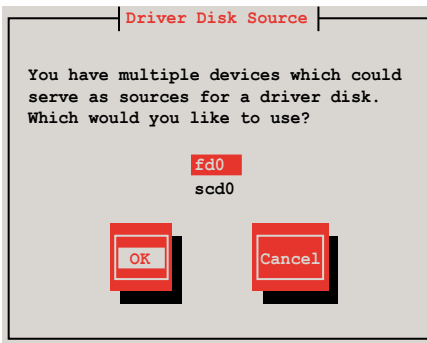
5.   Insert the Red Hat® Enterprise RAID driver disk to the floppy disk drive, select
      OK, then press <Enter>.

```
┌──────────────┤ Insert Driver Disk ├──────────────┐
│                                                   │
│   Insert your driver disk into /dev/fd0           │
│   and press "OK" to continue.                     │
│                                                   │
│                                                   │
│        ┌────────┐          ┌────────┐             │
│        │   OK   │          │  Back  │             │
│        └────────┘          └────────┘             │
│                                                   │
│                                                   │
└───────────────────────────────────────────────────┘
```
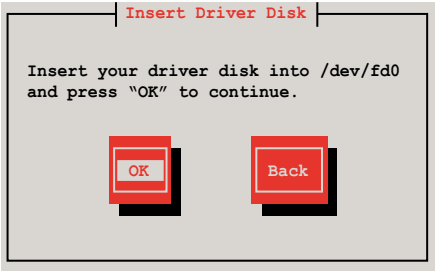
The drivers for the RAID card are installed to the system.

6.   When asked if you will load additional RAID controller drivers, select **No**, then
      press <Enter>.

```
┌──────────────┤ More Driver Disks? ├──────────────┐
│                                                   │
│   Do you wish to load any more                    │
│   driver disks?                                   │
│                                                   │
│                                                   │
│        ┌────────┐          ┌────────┐             │
│        │  Yes   │          │   No   │             │
│        └────────┘          └────────┘             │
│                                                   │
│                                                   │
└───────────────────────────────────────────────────┘
```
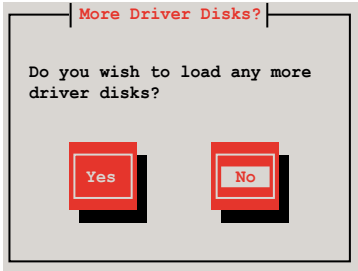
7.   Follow the screen instructions to continue the OS installation.

3.1.4 SUSE Linux Enterprise Server OS
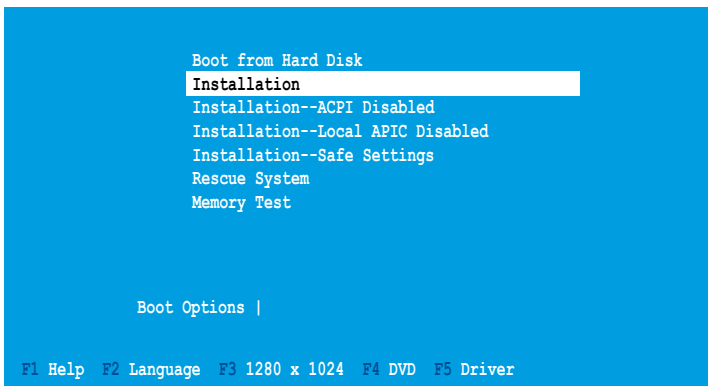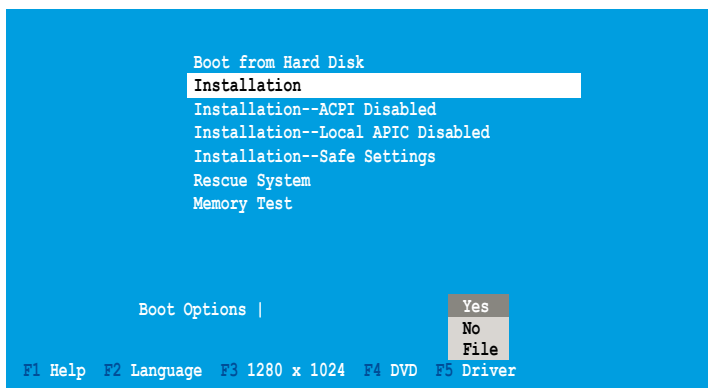
To install the RAID card driver when installing SUSE Linux Enterprise Server OS:

1. Boot the system from the SUSE OS installation CD.

2. Use the arrow keys to select **Installation** from the **Boot Options** menu.

```
              Boot from Hard Disk
              Installation
              Installation--ACPI Disabled
              Installation--Local APIC Disabled
              Installation--Safe Settings
              Rescue System
              Memory Test




         Boot Options |


 F1 Help  F2 Language  F3 1280 x 1024  F4 DVD  F5 Driver
```

3. Press <F5>, then select **Yes** from the menu. Press <Enter>.

```
              Boot from Hard Disk
              Installation
              Installation--ACPI Disabled
              Installation--Local APIC Disabled
              Installation--Safe Settings
              Rescue System
              Memory Test




         Boot Options |                      Yes
                                             No
                                             File
 F1 Help  F2 Language  F3 1280 x 1024  F4 DVD  F5 Driver
```

4.   Insert the RAID driver disk to the floppy disk drive. Make sure that **Installation** from the **Boot Options** menu is selected, then press <Enter>.

```
                        Boot from Hard Disk
                        Installation
                        Installation--ACPI Disabled
                        Installation--Local APIC Disabled
                        Installation--Safe Settings
                        Rescue System
                        Memory Test



                 Boot Options |


 F1 Help  F2 Language  F3 1280 x 1024  F4 DVD  F5 Driver
```
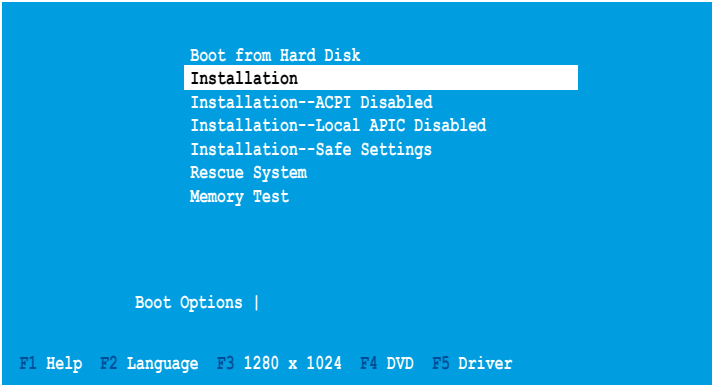
5.   When below screen appears, select the floppy disk drive (fd0) as the driver update medium. Select **OK**, then press <Enter>.

```
      Please choose the Driver Update medium.

        fd0: Floppy
        sr0: CD-ROM, TEAC DV-516E
        sda: Disk, SEAGATE ST336754SS
        sdb: Disk, SEAGATE ST336754SS
        Other device


              OK              Back
```
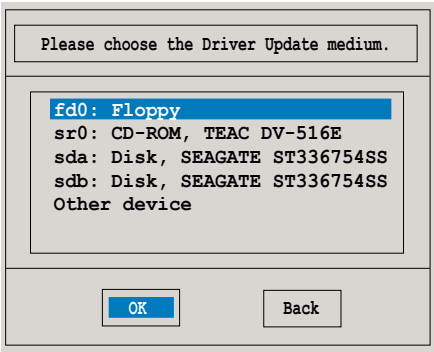
The drivers for the RAID controller are installed to the system.