

# **PCI Express SATA / eSATA 6Gb/s RAID Card User Manual**

## **Specifications :**

- 2 x SATA 6Gb/s Port (SATA version)
- 2 x eSATA 6Gb/s Port (eSATA version)
- Max. 6Gb/s transfer rate per port
- Supports both SATA 1.5Gb/s, 3Gb/s and 6Gb/s HDD drives, HDD size up to 2TB
- 1 x HDD Activity LED Header
- PCI Express Base 2.0 specification compliant
- Supports both 2.5Gb/s & 5Gb/s PCI Express transfer speed
- Supports IDE programming interface register for the SATA controller
- Supports AHCI programming interface registers
- Supports error reporting, recovery & correction
- Serial ATA rev. 3.0 compliant
- Supports Gen 1i, Gen 1x, Gen 2i, Gen 2m, Gen 2x, & Gen 3i
- Serial ATA AHCI specification rev.1.0 compliant
- Supports Port Multiplier FIS based switching or command based switching
- Supports AES-256
- Supports RAID 0, 1 or Non-RAID modes
- Supports Native Command Queue(NCQ)
- Supports Hot Plug & Hot Swap
- Supports Low Profile (Optional)
- Drivers support Windows 2000 or above
- MAC OS X 10.6 or above, Linux Kernel 2.6.19 or above, FreeBSD are native supported for Non-RAID mode

## **Packings :**

- 1 x PCI Express SATA / eSATA Card
  - 1 x Driver/Manual CD
-

## Marvell RAID BIOS Configuration :

1. After installing PCI Express Card into PCI Express 2.0 slot of the computer, the following screen will be shown during computer boot up.
2. If PCI Express 1.0 slot is installed, the second line of the screen will show "PCIe x 1 2.5Gbps".

```
Marvell 88SE91xx Adapter - BIOS Version 1.0.0.1012
PCIe x 1 5.0Gbps
Mode : CPU AHCI
Virtual Disk
  No Virtual Disk!
Physical Disk
  [ID]  [Disk Name]                [Size]  [Speed]
    0    SATA ST32000641AS         2TB      6.0G
    8    SATA ST32000641AS         2TB      6.0G

Press <Ctrl>+<M> to enter BIOS Setup or <Space> to continue
```

3. Press <Space> to proceed normal boot. Hard drives are working as non-RAID mode. Or, press <Ctrl>+<M> to enter Marvell BIOS Setup to set RAID array. The following screen will be shown.

```
Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.
-----
Topology | Information
-----|-----
HBA 0: Marvell 0
  { Virtual Disks
  { Free Physical Disks
    { PD 0: ST32000641AS
    { PD 8: ST32000641AS

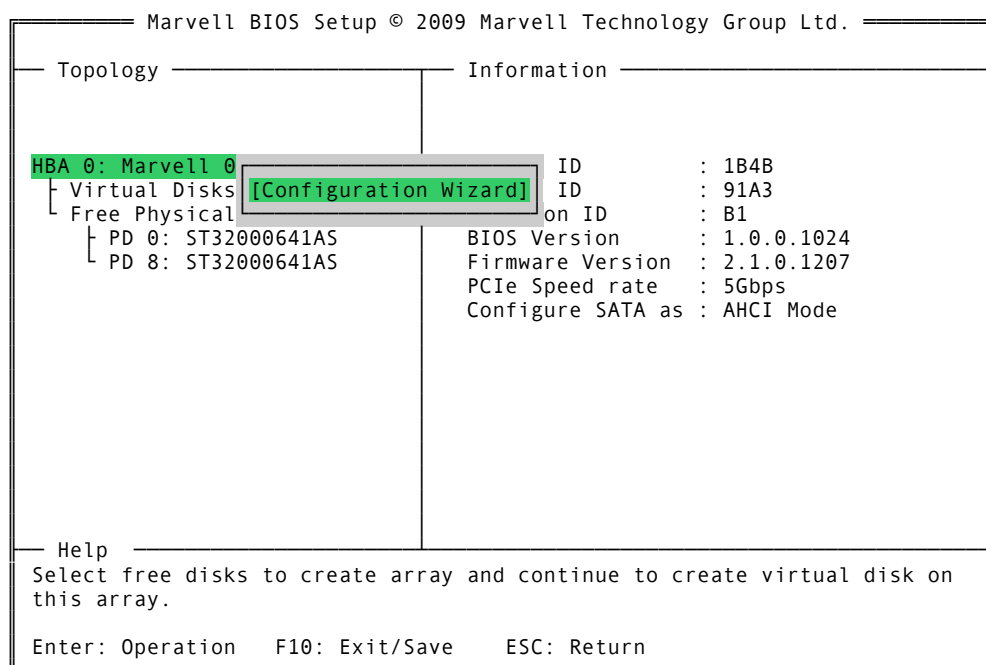
Vendor ID       : 1B4B
Device ID      : 91A3
Revision ID    : B1
BIOS Version   : 1.0.0.1024
Firmware Version : 2.1.0.1207
PCIe Speed rate : 5Gbps
Configure SATA as : AHCI Mode

Help
Select free disks to create array and continue to create virtual disk on
this array.

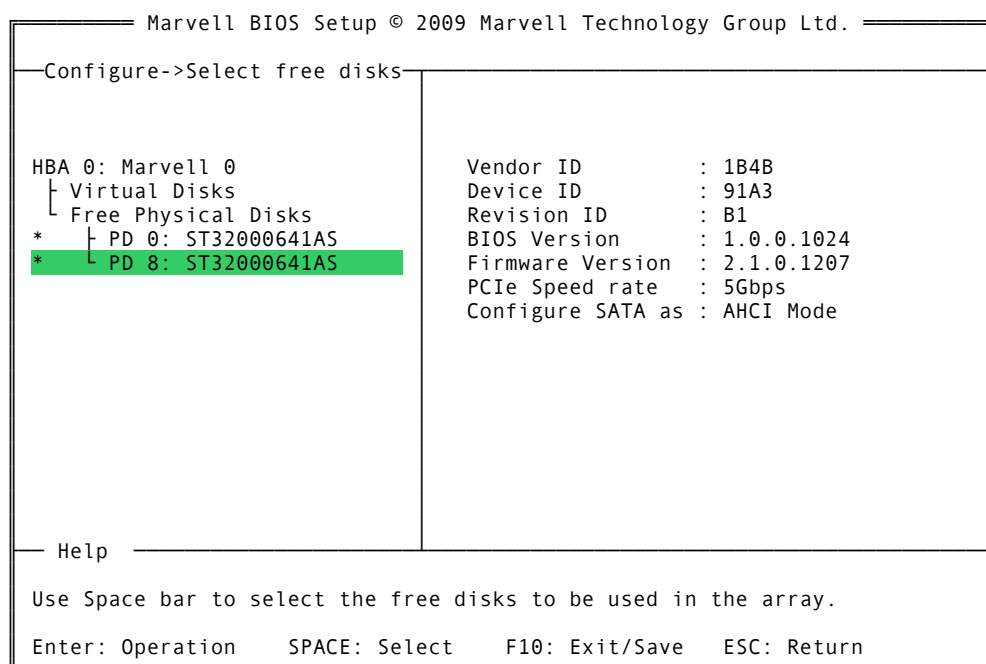
Enter: Operation  F10: Exit/Save  ESC: Return
```

## Create a RAID Array :

1. Use keyboard arrow keys and <Space> to select "HBA 0 : Marvell 0".
2. "Configuration Wizard" will be shown, press <Enter> to start creating Virtual Disk.



3. Use keyboard arrow keys and <Space> to select disks in Free Physical Disks list. Selected Disks will be marked with "\*".



4. Press <Enter> to proceed configuring Virtual Disks.
5. Select RAID Level (RAID Mode) : RAID 0 (Stripe) or RAID 1 (Mirror).

```
Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.

-Configure->Select free disksCreate Virtual Disk-

HBA 0: Marvell 0
├ Virtual Disks
└ Free Physical Disks
  * └ PD 0: ST32000641AS
  * └ PD 8: ST32000641AS

RAID Level      : RAID 0
Max Size (MB)   : 152378
Stripe Size     : 64K
Gigabyte Rounding : 1G
Quick Init      : Yes
VD Name         : Default
Disk ID         : 0 8
Next

[RAID 0]
[RAID 1]

Help

Virtual disk configurations.

Enter: Select    F10: Exit/Save    ESC: Return
```

6. Select Stripe Size (Stripe Block Size) : 32K or 64K.

```
Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.

-Configure->Select free disksCreate Virtual Disk-

HBA 0: Marvell 0
├ Virtual Disks
└ Free Physical Disks
  * └ PD 0: ST32000641AS
  * └ PD 8: ST32000641AS

RAID Level      : RAID 0
Max Size (MB)   : 152378
Stripe Size     : 64K
Gigabyte Rounding : 1G
Quick Init      : Yes
VD Name         : Default
Disk ID         : 0 8
Next

32K
64K

Help

Virtual disk configurations.

Enter: Select    F10: Exit/Save    ESC: Return
```

7. Select Gigabyte Rounding (To permit the installation of a replacement drive that is smaller than the failed driver when performing a RAID 1 rebuild) : None or 1G or 10G.

Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.

Configure->Select free disks>Create Virtual Disk

|                        |                        |
|------------------------|------------------------|
| HBA 0: Marvell 0       | RAID Level : RAID 0    |
| └ Virtual Disks        | Max Size (MB) : 152378 |
| └ Free Physical Disks  | Stripe Size : 64K      |
| * └ PD 0: ST32000641AS | Gigabyte Rounding : 1G |
| * └ PD 8: ST32000641AS | Quick Init : Yes       |
|                        | VD Name : Default      |
|                        | Disk ID : 0 8          |
|                        | Next                   |

None  
1G  
10G

Help

Virtual disk configurations.

Enter: Select F10: Exit/Save ESC: Return

8. Select Quick Init (Quickly erase old data on the hard drives when creating the array) : Yes or No.

Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.

Configure->Select free disks>Create Virtual Disk

|                        |                        |
|------------------------|------------------------|
| HBA 0: Marvell 0       | RAID Level : RAID 0    |
| └ Virtual Disks        | Max Size (MB) : 152378 |
| └ Free Physical Disks  | Stripe Size : 64K      |
| * └ PD 0: ST32000641AS | Gigabyte Rounding : 1G |
| * └ PD 8: ST32000641AS | Quick Init : Yes       |
|                        | VD Name : Default      |
|                        | Disk ID : 0 8          |
|                        | Next                   |

Yes  
No

Help

Virtual disk configurations.

Enter: Select F10: Exit/Save ESC: Return

## 9. Enter VD Name (RAID Array Name for identification).

| Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.  |   |
|--|---|
| Configure->Select free disksCreate Virtual Disk  |   |
| HBA 0: Marvell 0<br>  Virtual Disks<br>  Free Physical Disks<br>*   PD 0: ST32000641AS<br>*   PD 8: ST32000641AS | RAID Level : RAID 0<br>Max Size (MB) : 152378<br>Stripe Size : 64K<br>Gigabyte Rounding : 1G<br>Quick Init : Yes<br>VD Name : Array1<-<br>Disk ID : 0 8<br>Next |
| Help<br>Virtual disk configurations.<br>Enter: Select F10: Exit/Save ESC: Return                                 |   |

## 10. Select Next to finish the configuration setup.

| Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.  |   |
|--|---|
| Configure->Select free disksCreate Virtual Disk  |   |
| HBA 0: Marvell 0<br>  Virtual Disks<br>  Free Physical Disks<br>*   PD 0: ST32000641AS<br>*   PD 8: ST32000641AS | RAID Level : RAID 0<br>Max Size (MB) : 152378<br>Stripe Size : 64K<br>Gigabyte Rounding : 1G<br>Quick Init : Yes<br>VD Name : Array1<br>Disk ID : 0 8<br>Next |
| Help<br>Virtual disk configurations.<br>Enter: Select F10: Exit/Save ESC: Return                                 |   |

## 11. Select Yes to confirm Virtual Disk creation.

```
Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.

--Configure->Select free disksCreate Virtual Disk--

HBA 0: Marvell 0
├ Virtual Disks
├ Free Physical Disks
├ * PD 0: ST32000641AS
├ * PD 8: ST32000641AS
└ RAID Level      : RAID 0
  Max Size (MB)   : 152378
  Stripe Size     : 64K
  Gigabyte Rounding : 1G
  Quick Init      : Yes
  VD Name         : Array1

Create Virtual Disk
Do you want to create this virtual disk?

Yes      No

Help

Use space bar to select the free disks to be used in the array.

Enter: Operation    SPACE: Select    F10: Exit/Save    ESC: Return
```

## 12. The new array set will be listed under Virtual Disks.

```
Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.

--Topology--      --Information--

HBA 0: Marvell 0
├ Virtual Disks
├   VD 0: Array1
├   PD 0: ST32000641AS
├   PD 8: ST32000641AS
├ Free Physical Disks
└ Vendor ID      : 1B4B
  Device ID     : 91A3
  Revision ID    : B1
  BIOS Version   : 1.0.0.1024
  Firmware Version : 2.1.0.1207
  PCIe Speed rate : 5Gbps
  Configure SATA as : AHCI Mode

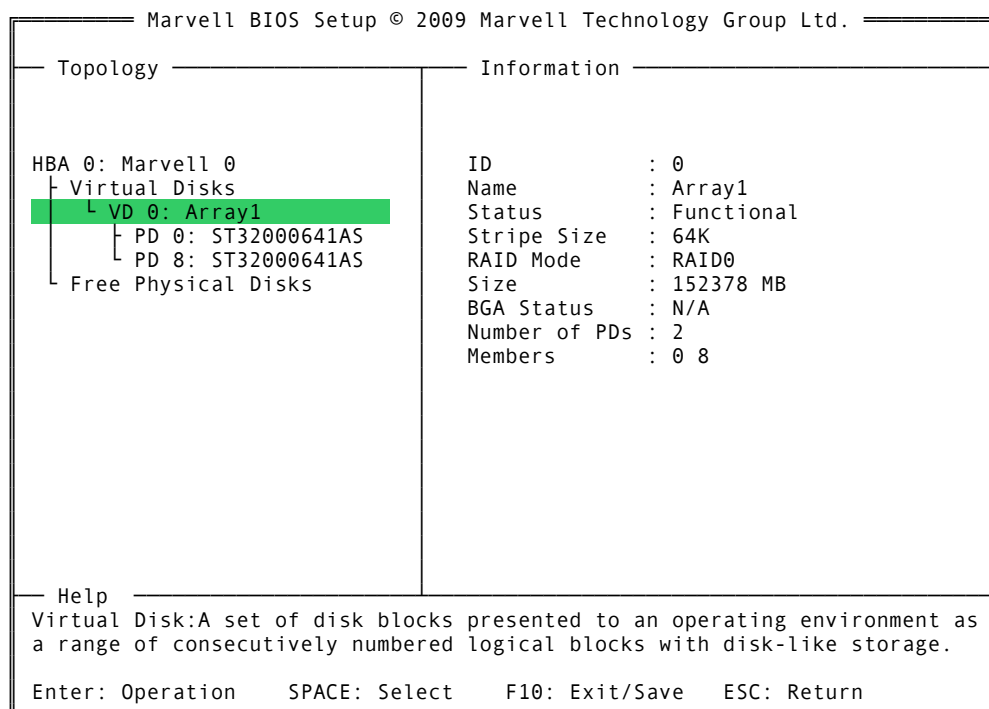
Help

Use Space bar to select the free disks to be used in the array.

Enter: Operation    SPACE: Select    F10: Exit/Save    ESC: Return
```



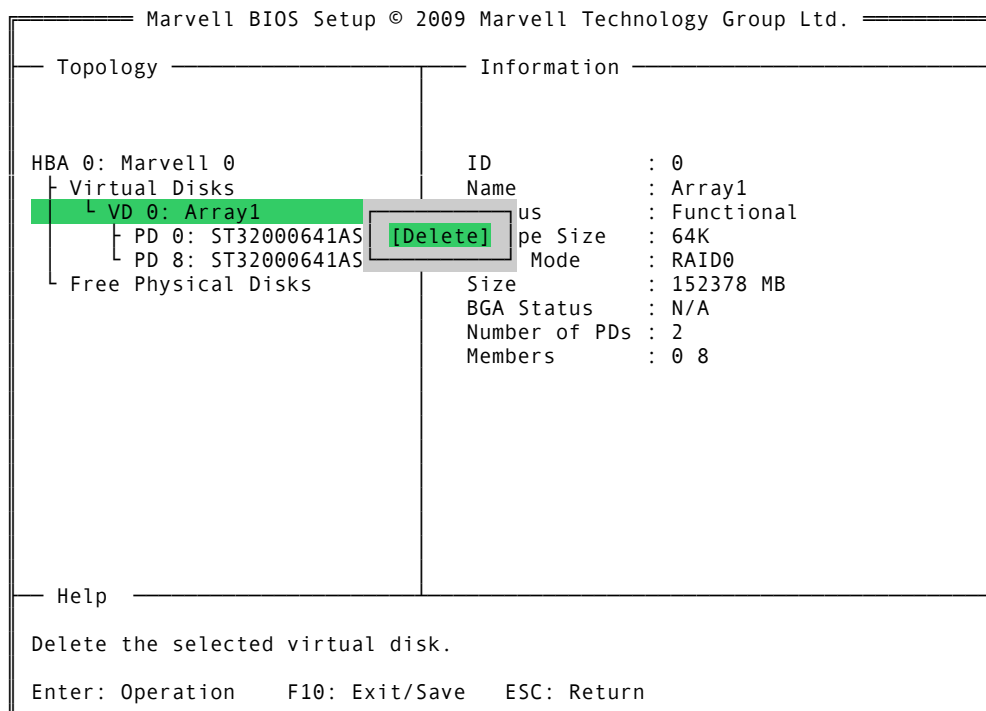
13. Select the new array under Virtual Disks to show the properties.



14. Press <F10> to save and exit Marvell BIOS Setup.

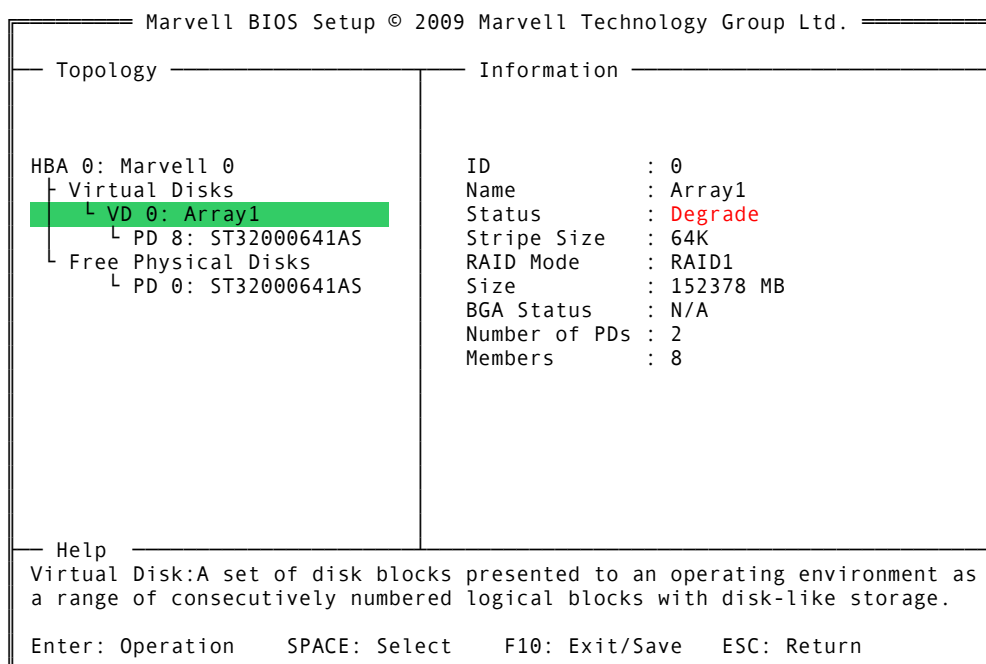
## Delete a RAID Array :

1. Select the RAID Array under Virtual Disks and press <Enter>.

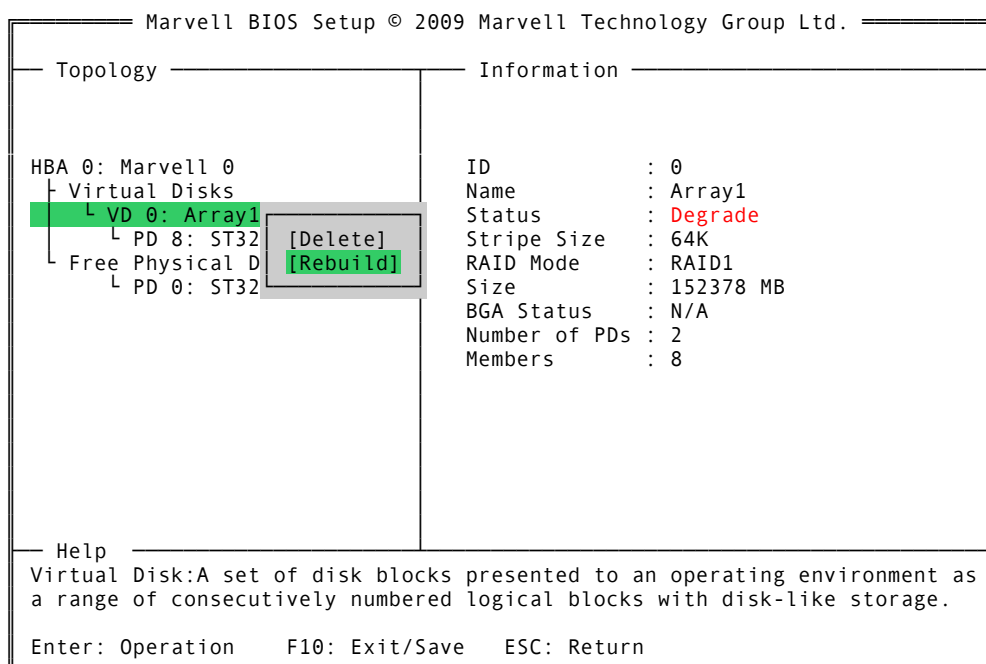


## Rebuild a RAID Array (Restoring data to another hard drive) :

1. Keep one original RAID array hard drive and install a new Hard drive to the card. Or, replace a failed Raid hard drive.
2. Bootup the computer and enter Marvell BIOS Setup.
3. The Hard drive list will be shown as below. The Virtual Disks status will shown "Degrade".



4. Press <Enter> to select Rebuild.



## 5. Select the new hard drive for rebuild.

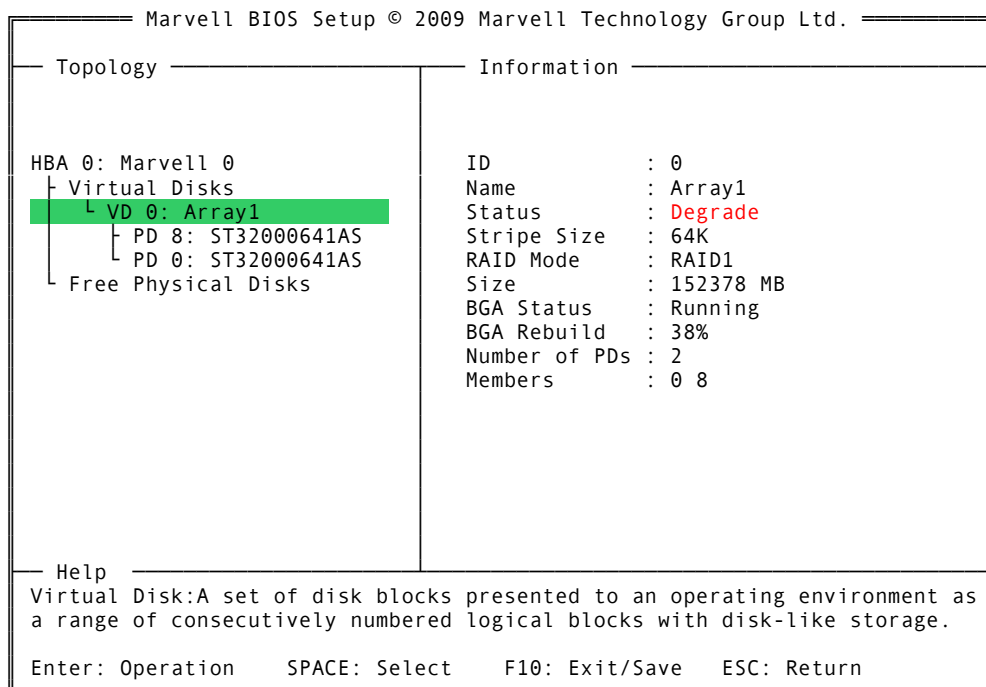
| Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.             |                         |
|---|-------------------------|
| Rebuild->Select free disks  | Information             |
| HBA 0: Marvell 0  | ID : 0                  |
| └ Virtual Disks   | Name : Array1           |
| └ VD 0: Array1  | Status : <b>Degrade</b> |
| └ PD 8: ST32000641AS  | Stripe Size : 64K       |
| Free Physical Disks   | RAID Mode : RAID1       |
| * └ PD 0: ST32000641AS  | Size : 152378 MB        |
|   | BGA Status : N/A        |
|   | Number of PDs : 2       |
|   | Members : 8             |
| Help  |                         |
| Use the space bar to select the free disks to be used in the array. |                         |
| Enter: Operation    SPACE: Select    F10: Exit/Save    ESC: Return  |                         |

## 6. Select Yes to confirm rebuild.

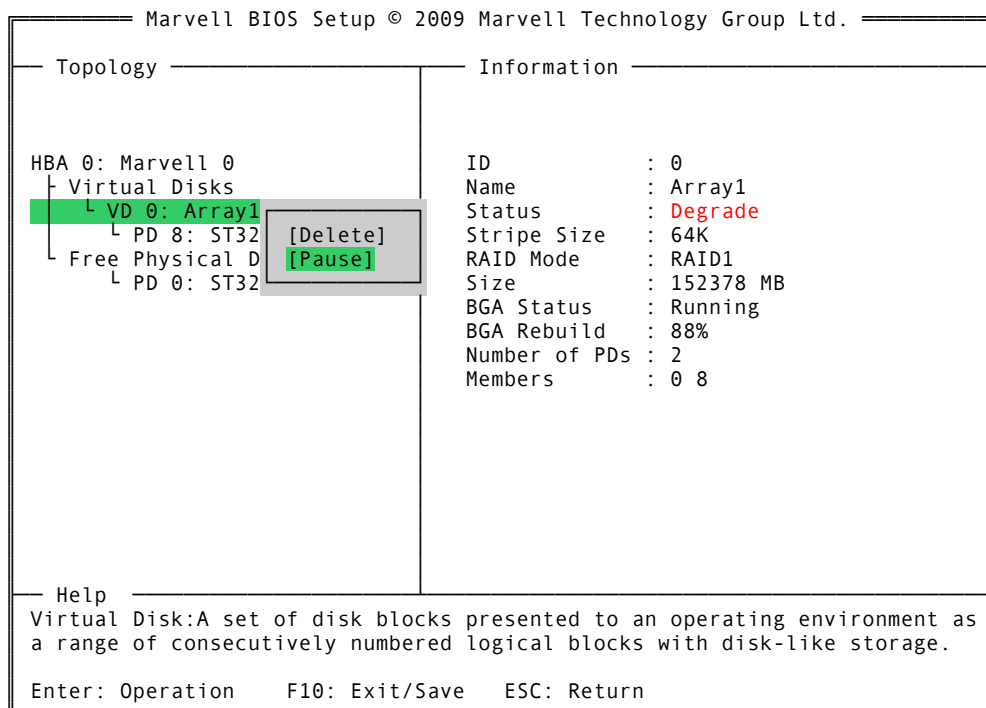
| Marvell BIOS Setup © 2009 Marvell Technology Group Ltd.   |                         |
|---|-------------------------|
| Rebuild->Select free disks  | Information             |
| HBA 0: Marvell 0  | ID : 0                  |
| └ Virtual Disks   | Name : Array1           |
| └ VD 0: Array1  | Status : <b>Degrade</b> |
| └ PD 8: ST32000641AS  | Stripe Size : 64K       |
| Free Physical Disks   | RAID Mode : RAID1       |
| └ PD 0: ST32000641AS  | Size : 152378 MB        |
| <div>Rebuild</div> <div>Do you want to rebuild with selected physical disk on this vd?</div> <div>Yes      No</div> |                         |
| Help  |                         |
| Use the space bar to select the free disks to be used in the array.   |                         |
| Enter: Operation    SPACE: Select    F10: Exit/Save    ESC: Return  |                         |

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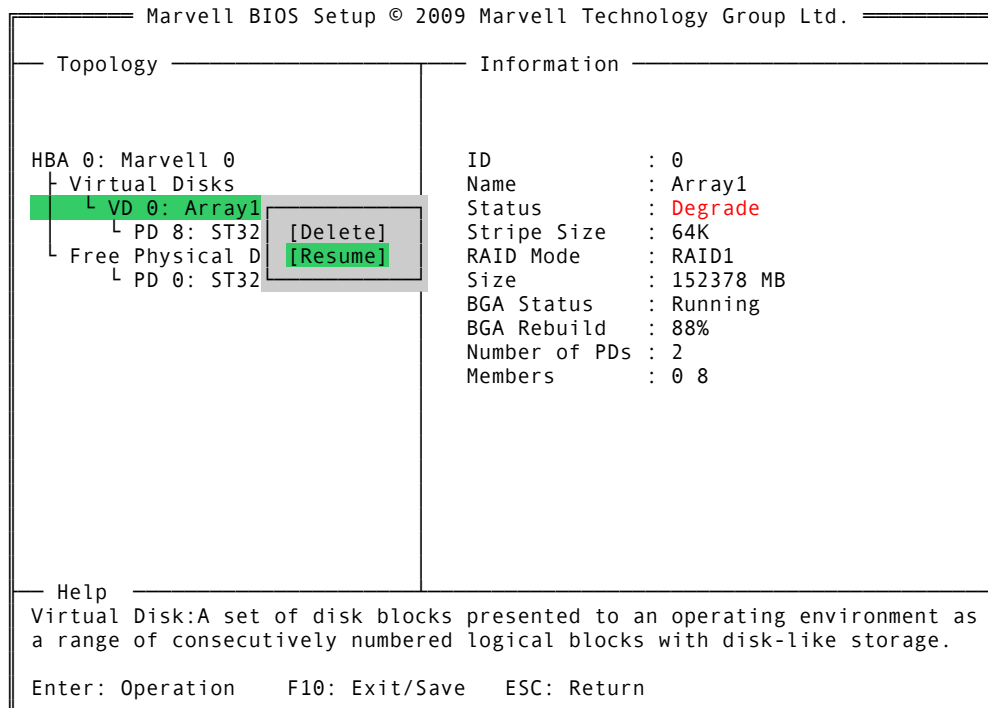
7. During the rebuild process, the rebuild status will be shown. The rebuild process will be stopped if this Rebuild screen is exit. Rebuild process can be resumed by run Marvell BIOS setup again.



8. To Pause the rebuild process, select the Virtual Disk(VD) and press <Enter>.

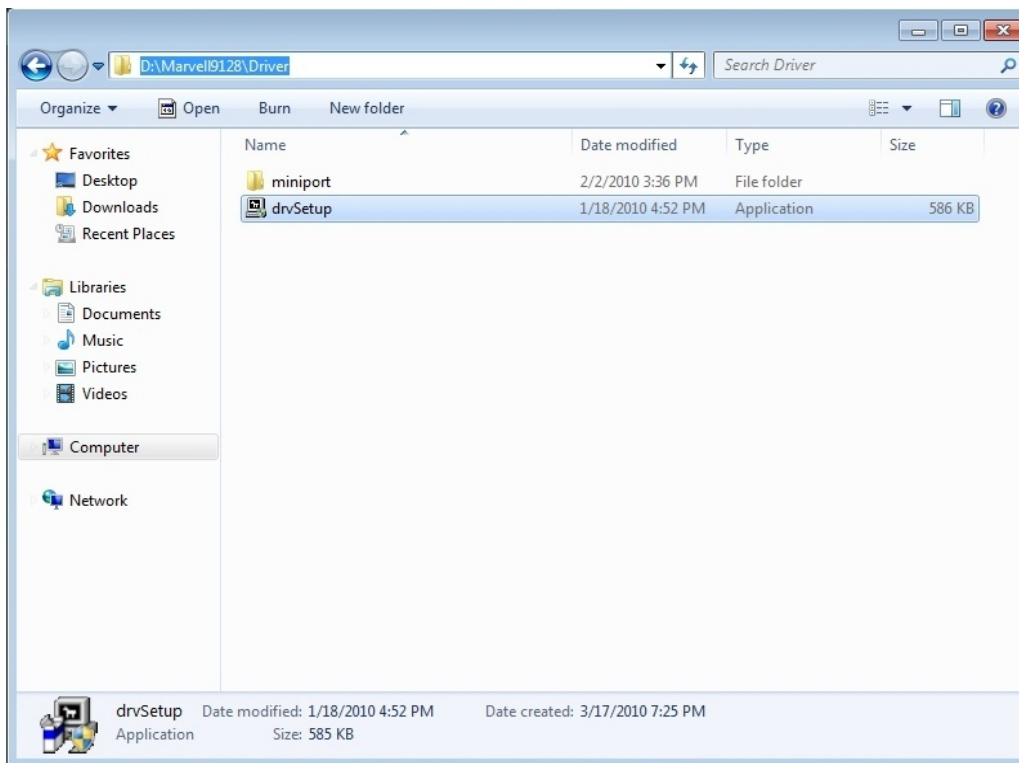


9. To Resume the rebuild process, select the Virtual Disk(VD) and press <Enter>.



## Drivers Installation (Windows 7) :

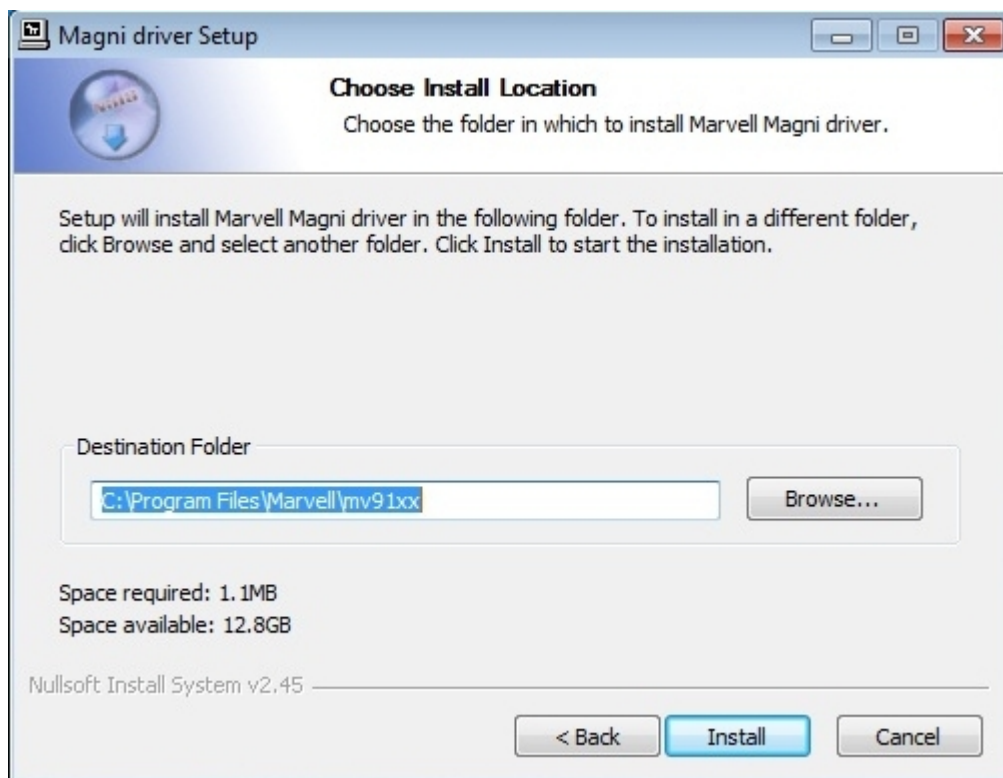
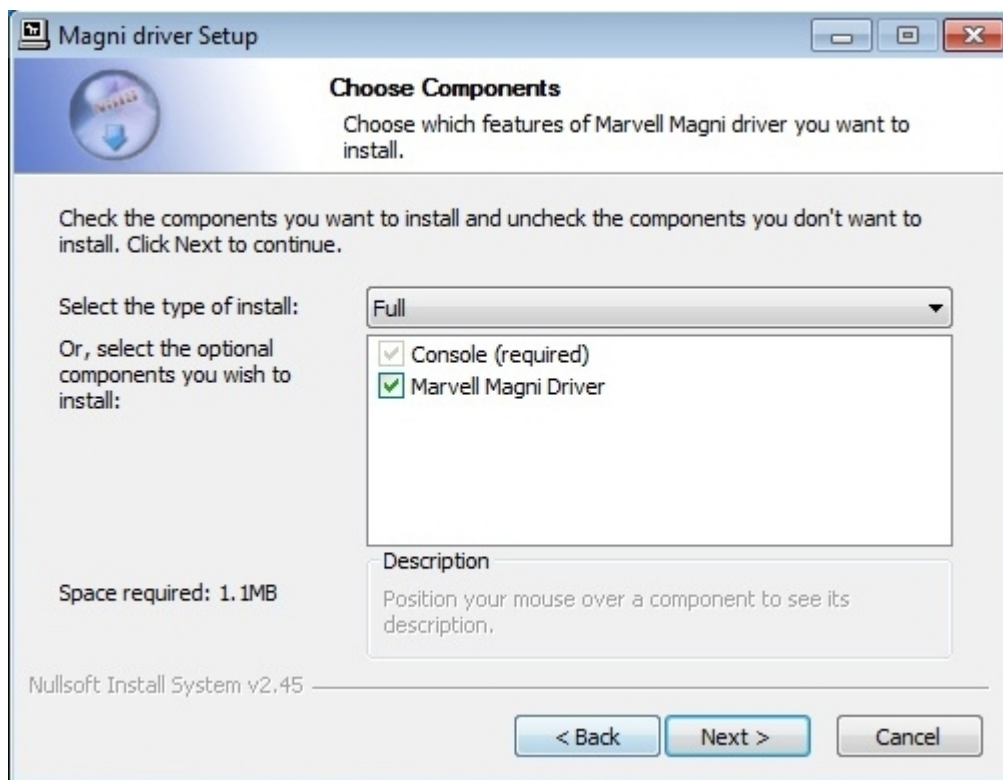
1. After Windows 7 is boot-up, insert the Driver CD into the CD-ROM(D: Drive).
2. Run "DrvSetup.exe" in the CD directory "Marvell9128\Driver".



3. Click Next to start drivers installation.



## 4. Follow the installation instructions.

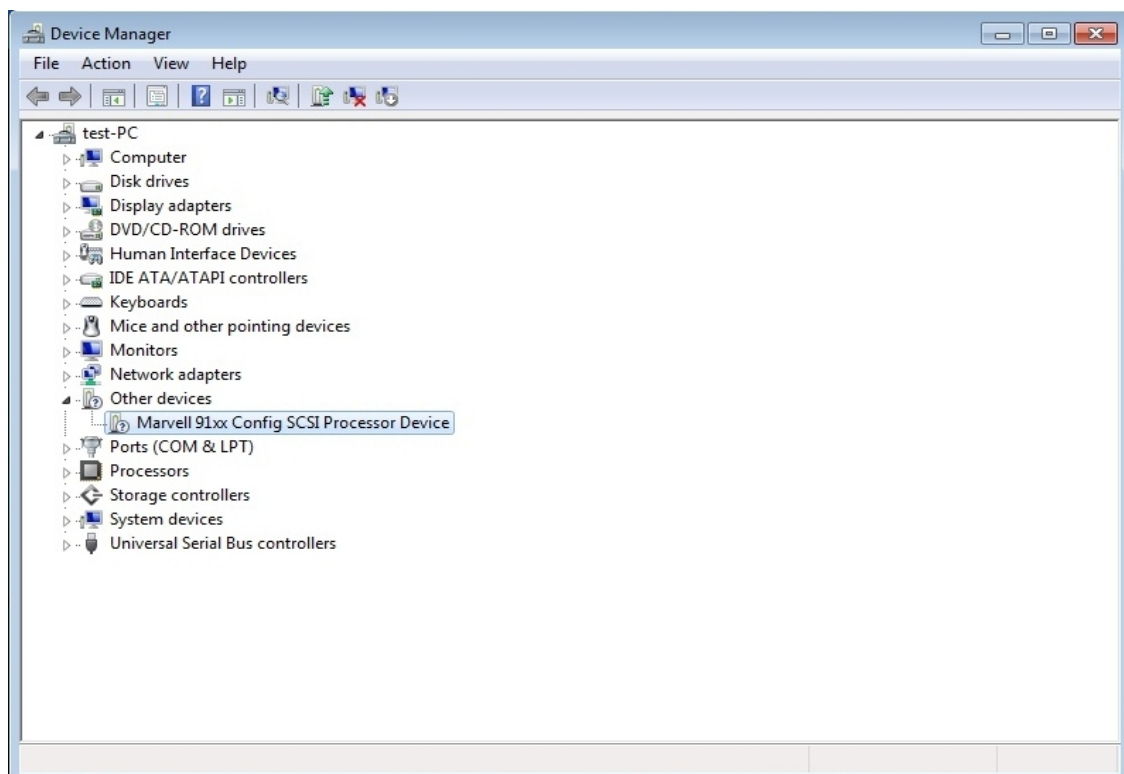




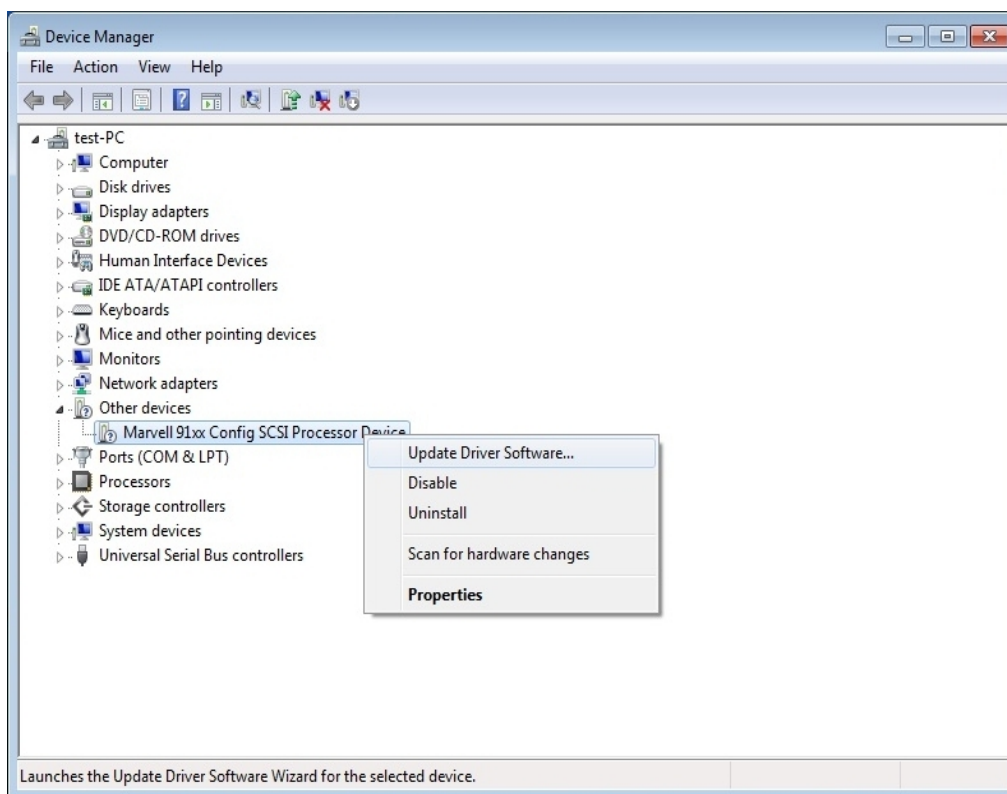
5. Click Finish to complete drivers installation.



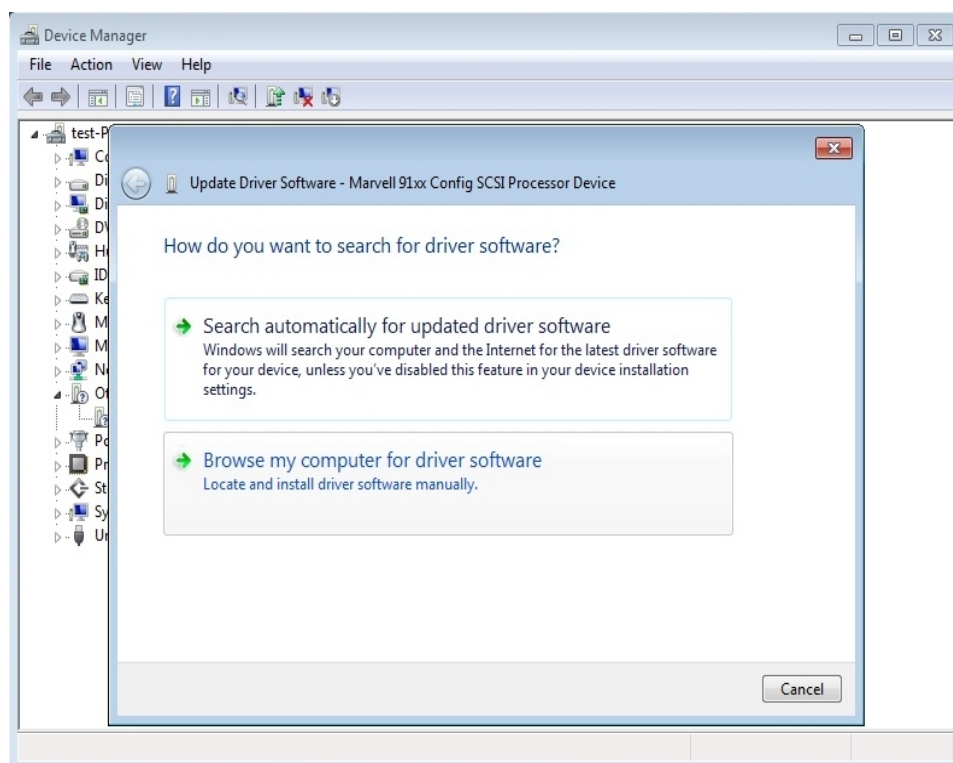
6. After drivers installation, Device Manager will show "Marvell 91xx Config SCSI Processor Device".



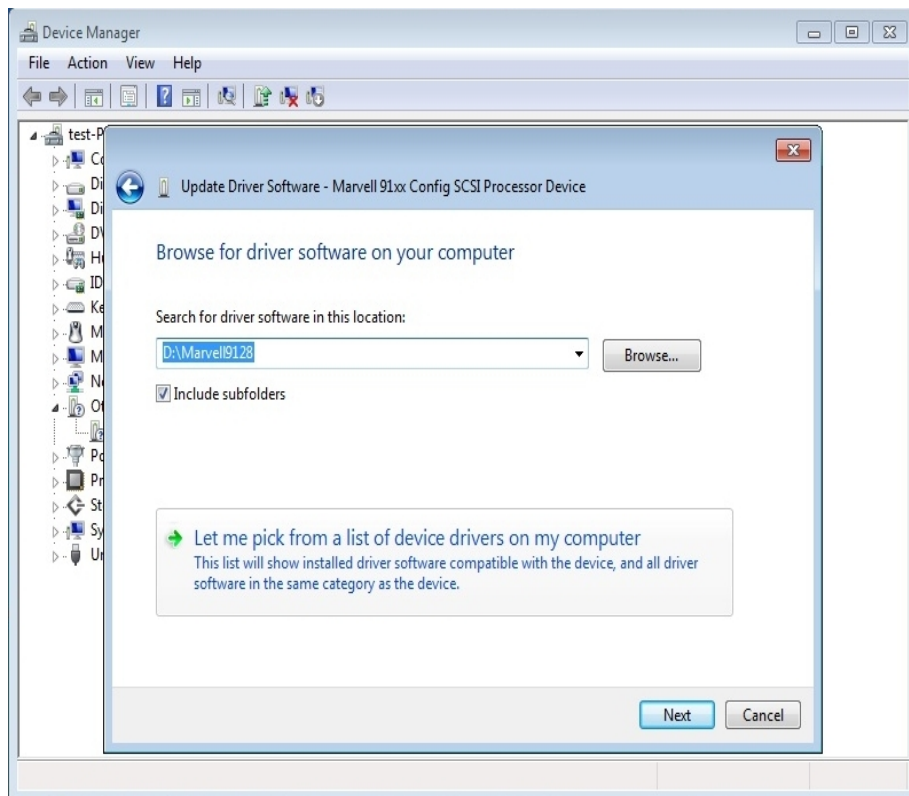
7. Right Click “Marvell 91xx Config SCSI Processor Device” and select “Update Driver Software”.



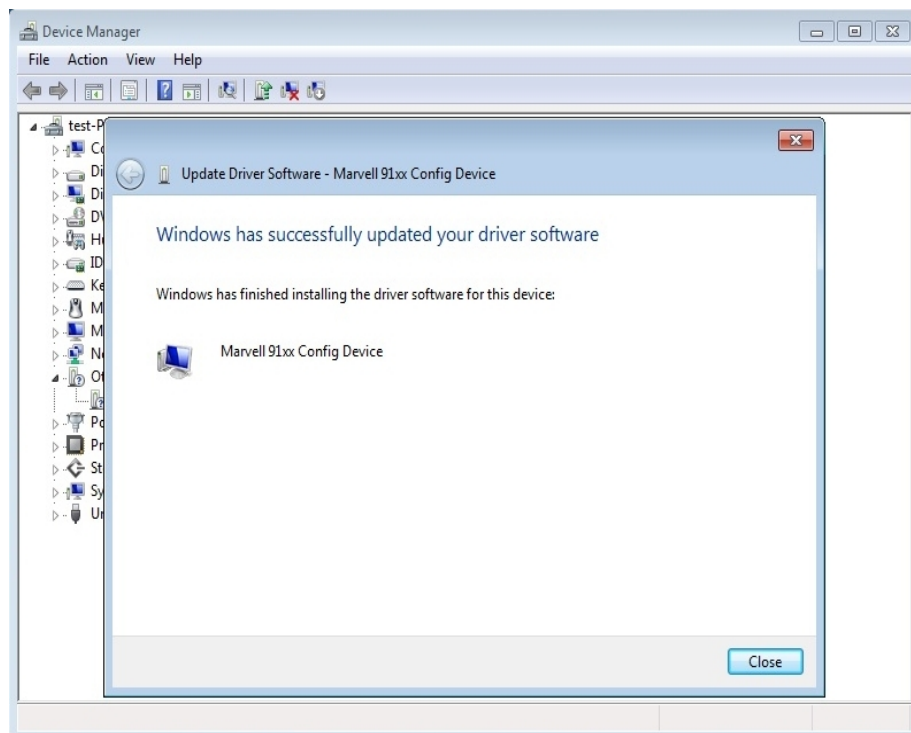
8. Select “Browse my computer for driver software”.



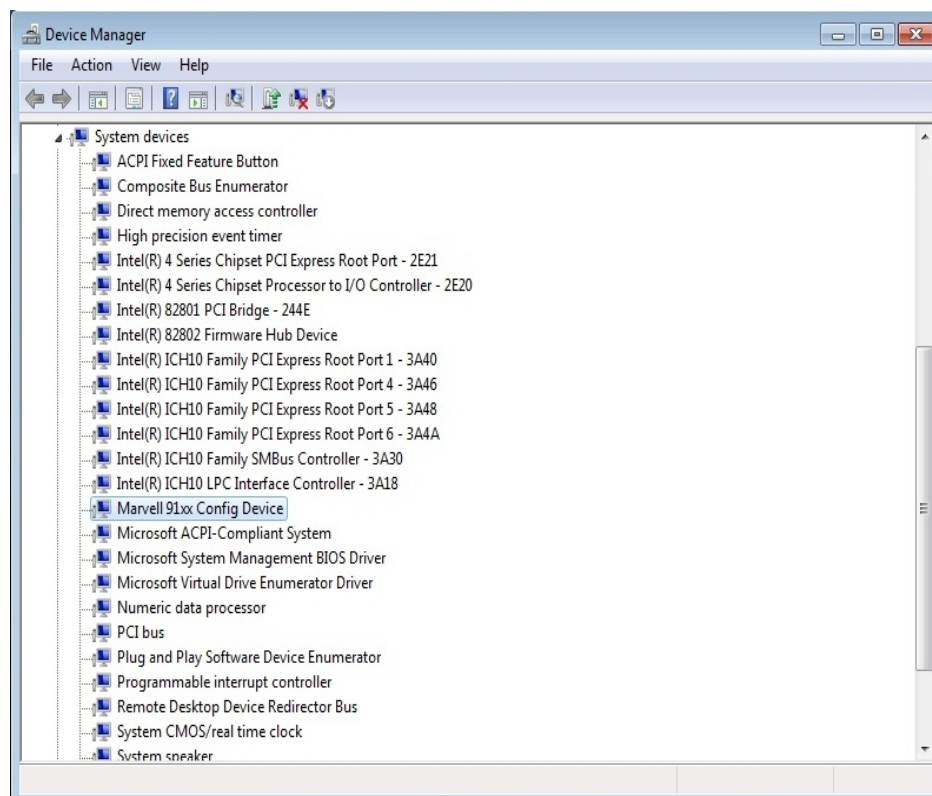
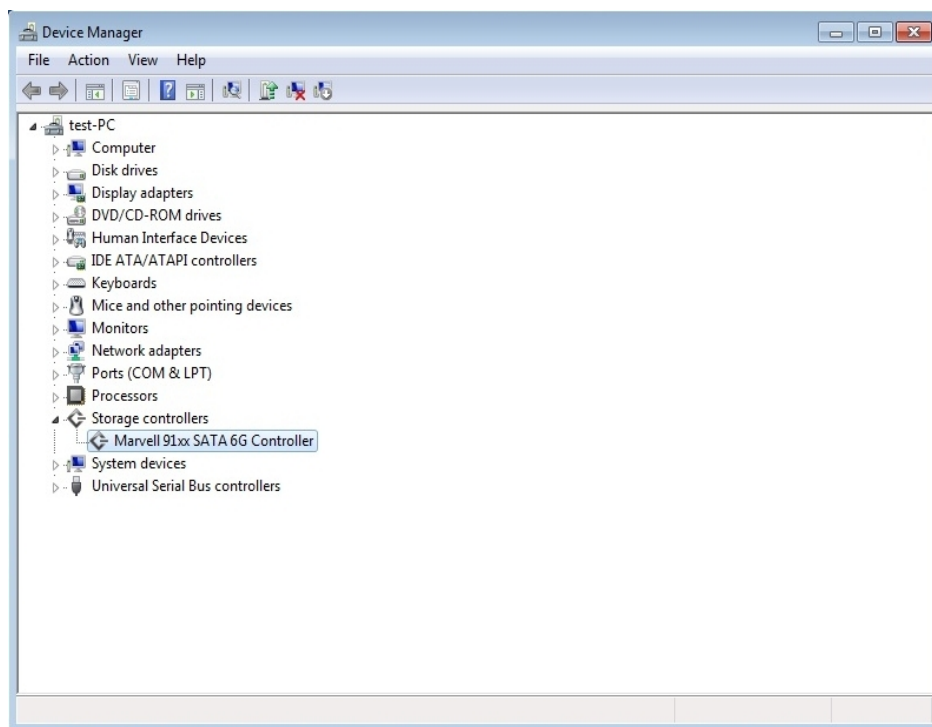
9. Browse "D:\Marvell9128\Driver", and click Next.



10. "Marvell 91xx Config Device" will be updated.

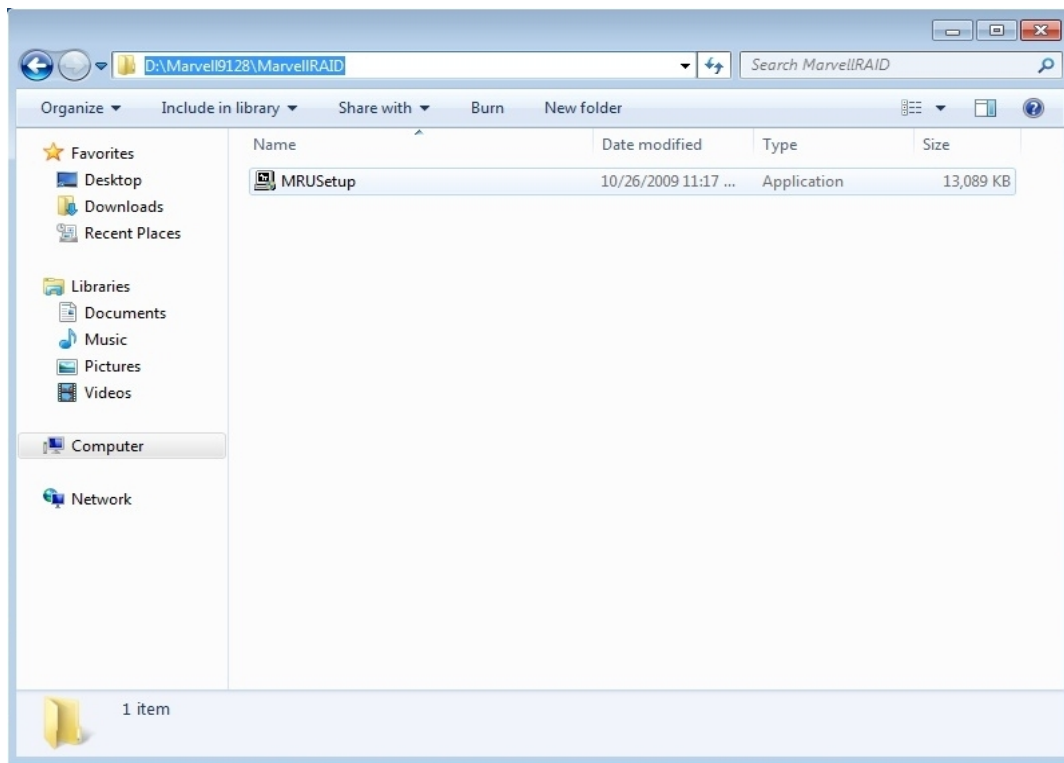


11. Device Manager will show "Marvell 91xx SATA 6G Controller" in the Storage controllers category. "Marvell 91xx Config Device" will be shown under System devices list.



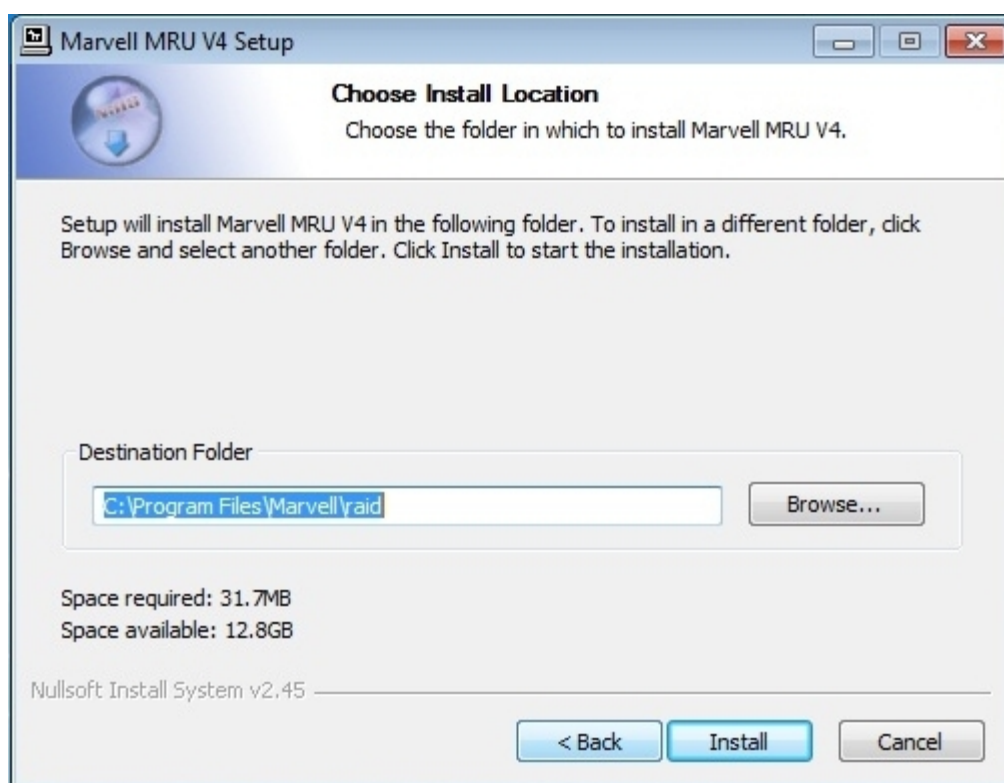
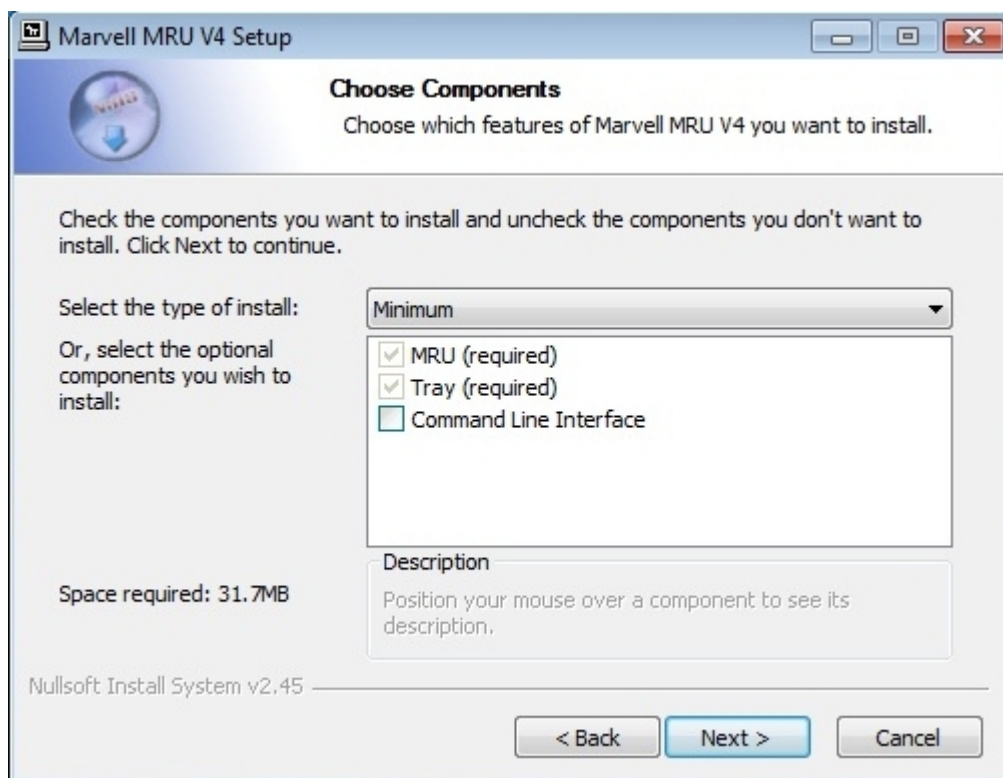
## Marvell RAID Utility Installation (Windows 7) :

1. Run "MRUSetup.exe" in D:\Marvell9128\MarvellRAID directory.



2. Follow the instructions.







3. After installation completed, MarvellTray will be shown on the Desktop. A Marvell RAID Utility(MRU) icon will be shown on the Task Bar.



## **Marvell RAID Utility (MRU)**

After installing MRU, user can access and control both local and remote adapters using the browser GUI. For remote access, user need to know the IP address of the system with the remote adapter.

For the MRU to work properly in the browser, **Active Scripting** must be enabled in your default browser.

## **Enable Active Scripting in Internet Explorer**

1. Select Tools → Internet Options → Security → Custom Level.
2. Under Scripting and check the radio button for Active Scripting.

## **Local Adapter**

User can access and control local adapters using the MRU Browser GUI.

## **Remote Adapter**

User can access and control remote adapters using the MRU Browser GUI.

1. Launch the default web browser.
2. Type the following web address in the address bar.

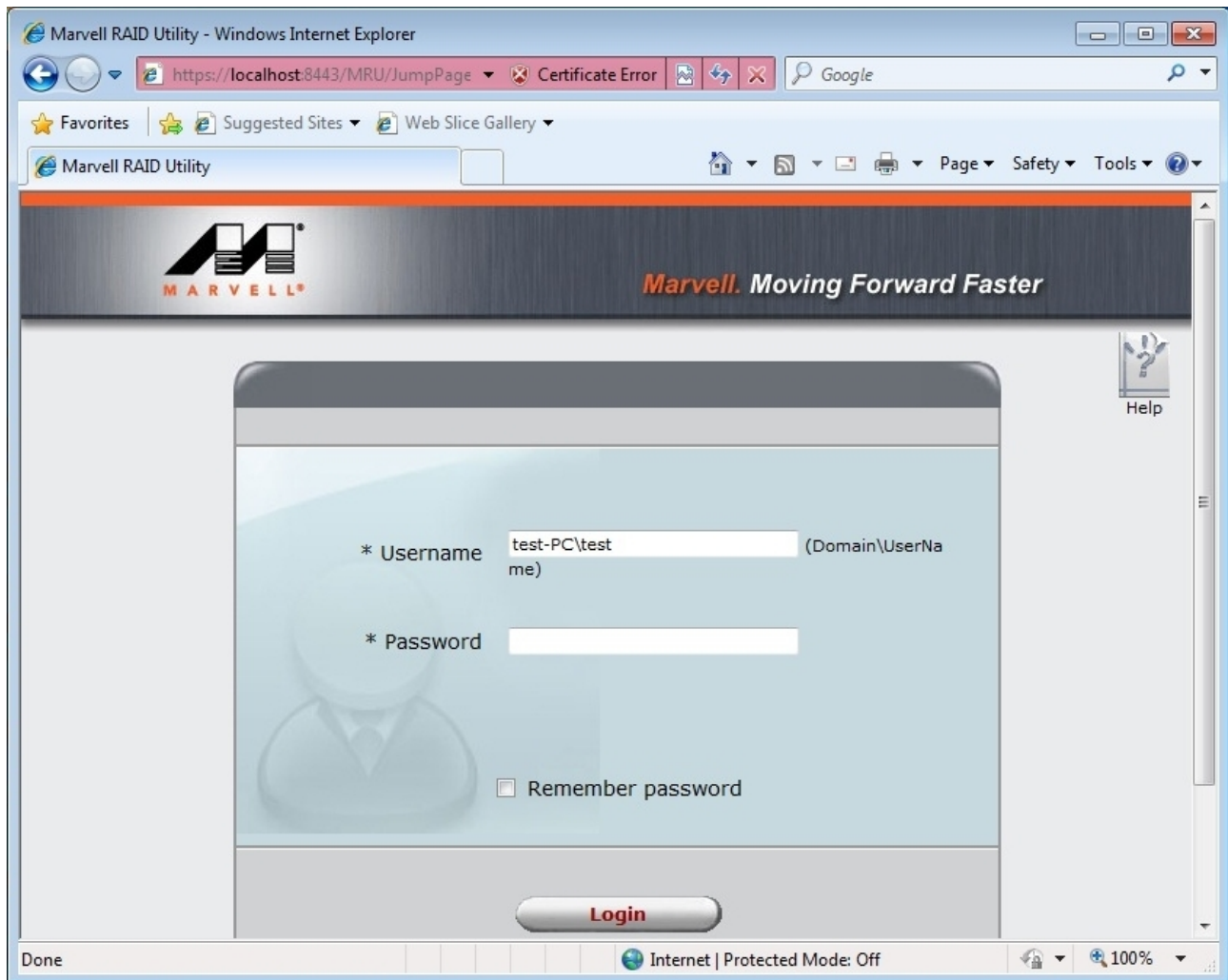
Http://\*Remote IP Address\*:8845/MRU/JumpPage.php?Target=LoginPage

Or, use the remote system name instead of the Remote IP Address in most internal network environments.

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## Login Screen

When the MRU is first started, Username and password is promoted. MRU user accounts and their premissions follow the OS user accounts and their permissions. Only user account with administrator privileges have access to all permissions. Non-administrator users have view-only permissions.





After Login, user can check, create, delete, rebuild the RAID array set.

