Workstation

English

Installation Guide

CELSIUS V830 SATA RAID

Are there ...

... any technical problems or other questions which you would like to be clarified?

Please contact:

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October 2005, Edition 1

Contents

Supported RAID levels

RAID-0

Implements striping (Data Striping) in order to provide the best possible performance but does not offer any kind of fault tolerance. An error on a single disk leads to the corruption of the whole array. RAID-0 is the most commonly used RAID level in workstations

RAID-1

Defines disk mirroring (Mirrored Arrays) that is to say the simultaneous writing of data on 2 disks. If one drive becomes defect, all of the data can be accessed on the second drive. Mirroring does not lead to performance loss during reading and writing.

RAID-10

Implements a Stripe Set of mirrored arrays. RAID-10 (also called RAID 0+1 or RAID 0/1) is a combination of RAID level 0 and 1. When implemented a RAID-0 stripe is created over a 2-disk array to provide better performance and, at the same time, increased security.

Prerequisite

The SATA RAID driver for CELSIUS V830, which is included in the chipset driver package, is needed to setup a SATA RAID array. Please make sure that the latest available driver is used. If a bootable RAID array is desired, the F6 SATA RAID Disk for CELSIUS V830 is needed. If not available, the disk could be easily created by copying all files of the driver directory “sataraid” to a floppy.

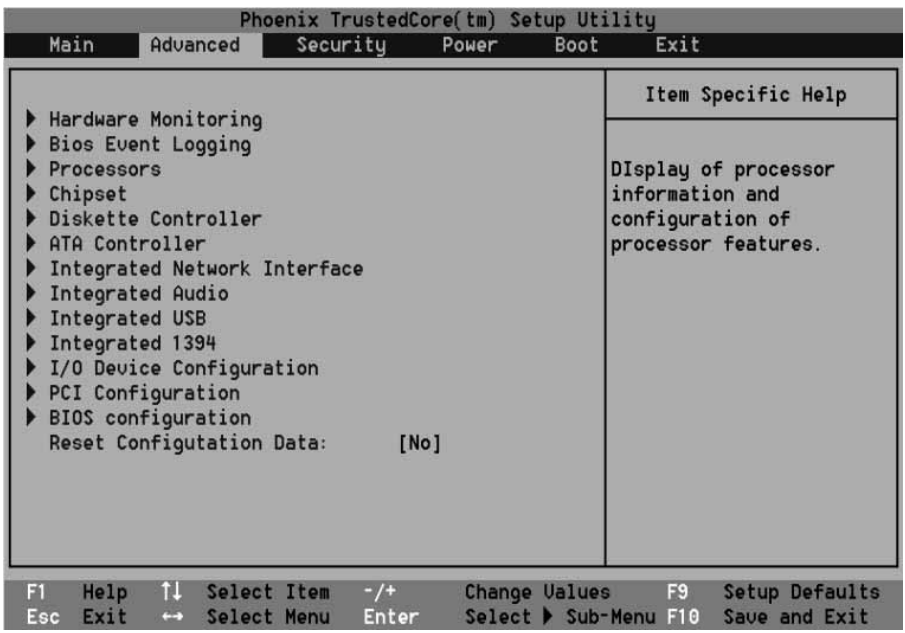
Configuration and Installation of RAID arrays

Configuration and Installation of a bootable RAID array

Configuration of System BIOS

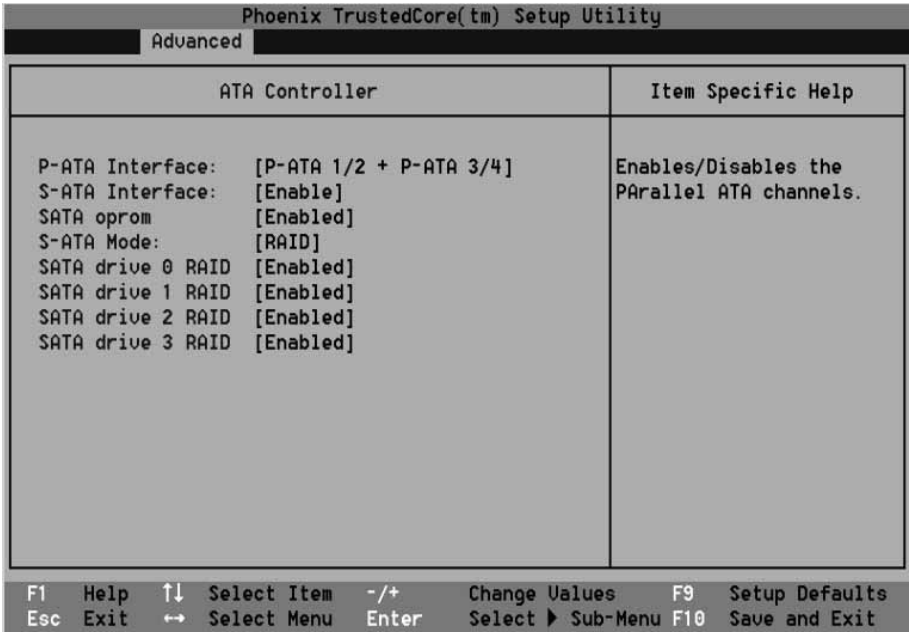
In System BIOS setup RAID has to be enabled and all intended disks have to be selected for RAID use.

Start your system and press *F2* to enter BIOS setup menu. After BIOS setup menu has called, choose the menu *Advanced* by using the arrow keys.



BIOS setup menu *Advanced*

Use the arrow keys to select *ATA controller* and press Enter.



BIOS setup menu *ATA Controller*

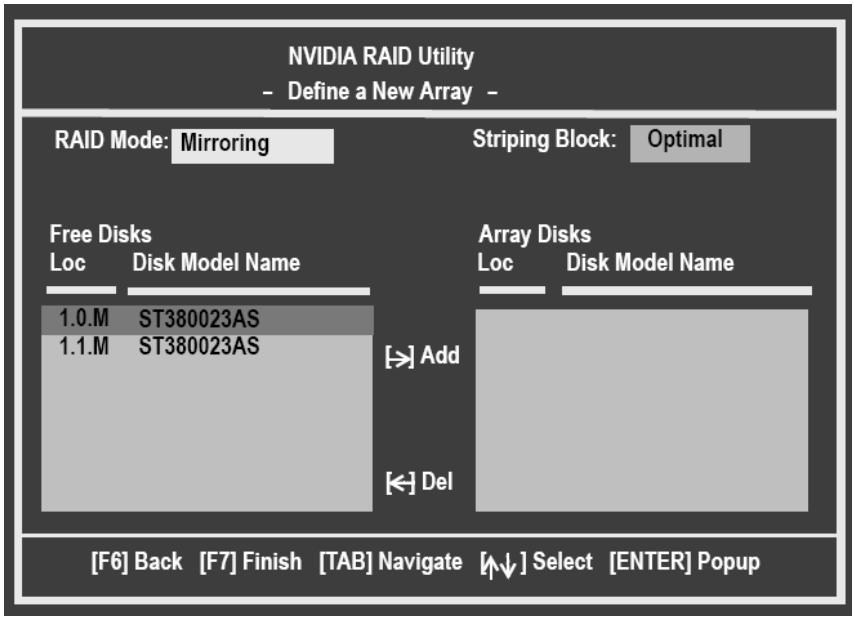
Enable SATA RAID by changing the value of *S-ATA Mode* to *RAID.* Afterwards set the value for *SATA drive x RAID* to *Enabled* for all disks you want to use as RAID disks. At the end press *F10* to save and exit BIOS setup menu. The system will reboot.

Configuration of NVIDIA RAID BIOS

After configuration of the System BIOS the RAID array type and the usage of the disks have to be chosen in NVIDIA RAID BIOS.

During boot of your computer you will be prompted to press F10 to enter NVIDIA RAID BIOS Utility. The prompt is appearing during System BIOS POST.

At the first call of the NVRAID BIOS Utility the window *Define a New Array* will appear.



NVidia RAID utility: *Define a New Array*

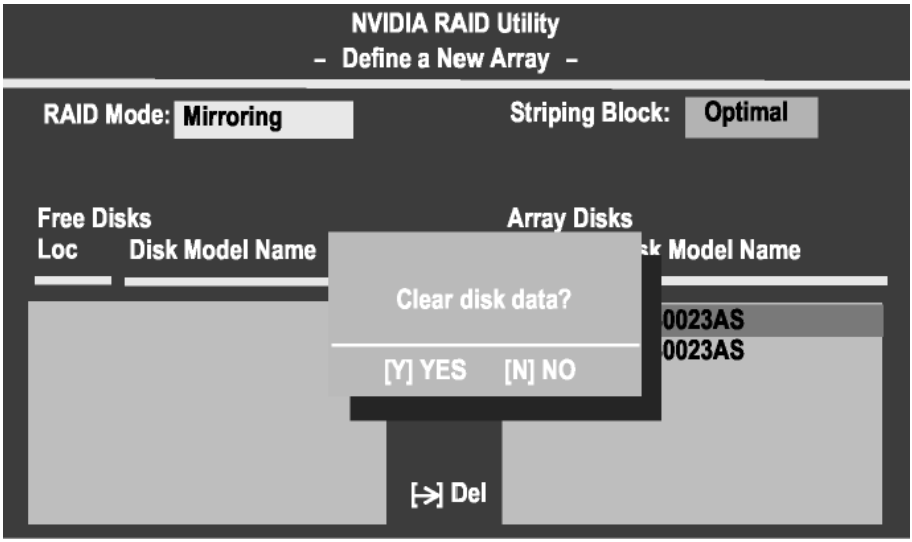
Following should be done to define a new array:

- Select the RAID mode

  By default, this is set to Mirroring. To change to a different RAID mode, press the down arrow key until the mode that you want appears in the RAID Mode box—either Mirroring, Striping, or Stripe Mirroring.
- Set up the Striping Block
  Striping block size is given in kilobytes, and affects how data is arranged on the disk. It is recommended to leave this value at the default Optimal, which is 64KB, but the values can be between 4 KB and 128 KB (4, 8, 16, 32, 64, and 128 KB).
- Specify which disks to use for the RAID array
  The disks that you enabled in System BIOS setup menu for RAID use appear in the Free Disks block. These are the drives that are available for use as RAID array disks. The Loc column of the Free Disks block shows the SATA port to which the drive is attached to.
  – 1.0.M means SATA drive 0
  – 1.1.M means SATA drive 1
  – 2.0.M means SATA drive 2
  – 2.1.M means SATA drive 3

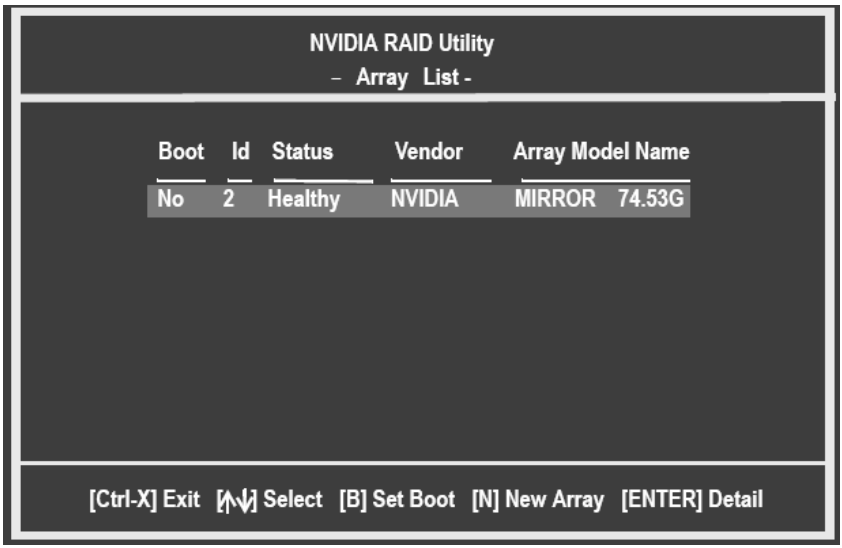
To designate a free disk to be used as a RAID array disk, tab to the Free Disks section.
The first disk in the list is selected. Move it from the Free Disks block to the Array Disks block by pressing the right-arrow key. The first disk in the list is moved, and the next disk in the list is selected and ready to be moved. Continue pressing the right-arrow key until all the disks that you want to use as RAID array disks appear in the Array Disks block.

- Completing the RAID BIOS Setup
- After assigning all RAID array disks, press *F7* to finish your setup process. You will be prompted to clear your disk data. Press *Y* to clear data of the drives you have assigned for RAID array use.



NVidia RAID utility: *Clear Disk Data prompt*

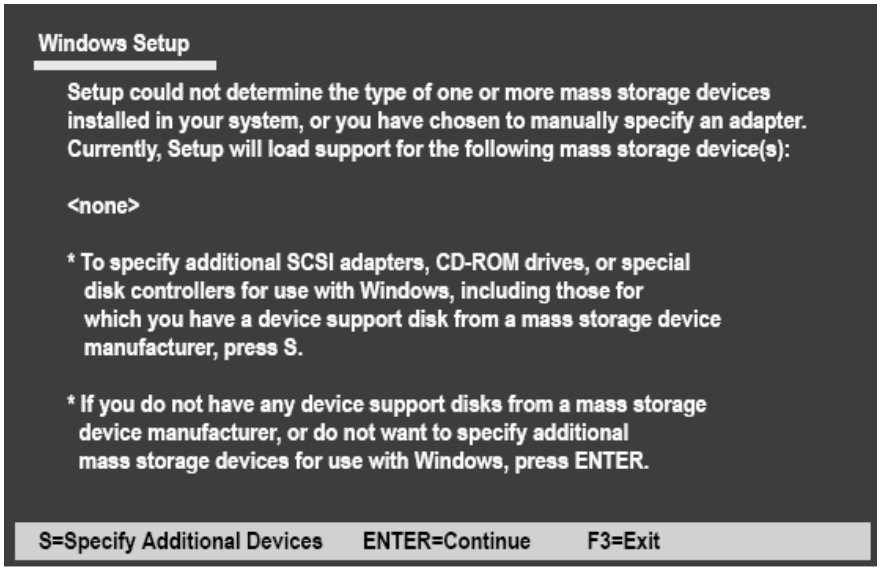
Afterwards the created array will be shown at the screen. Press *B* to mark the array as bootable. Details of the array will be shown by selecting the array and pressing Enter.



NVidia RAID utility: *Array list*

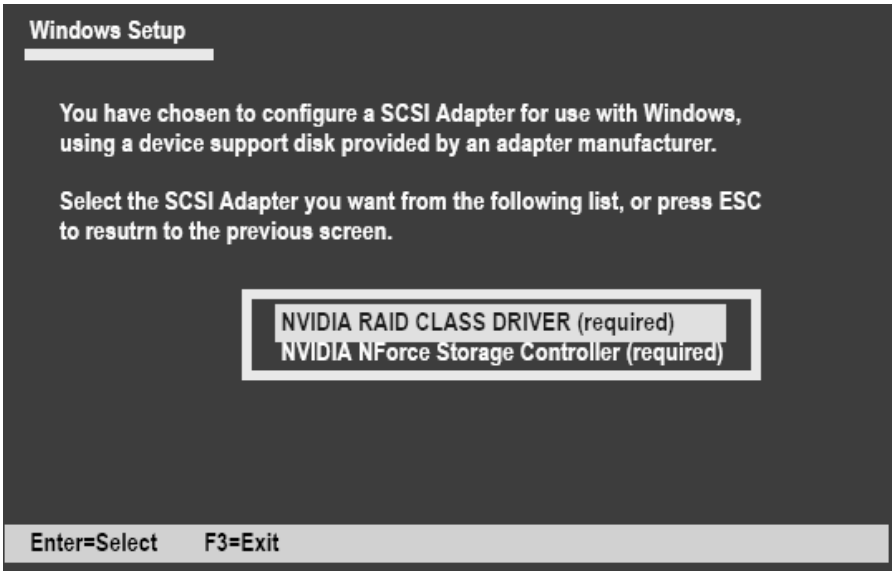
Installation of Microsoft Operating System

After completion of the RAID BIOS configuration, boot your system from your Microsoft operating systems CD (either Windows XP Professional or Windows XP Professional x64). At the beginning of Windows setup program you will be prompted to press *F6* to install additional drivers. Press *F6* and wait a few moments, the setup screen to integrate additional drivers appear.



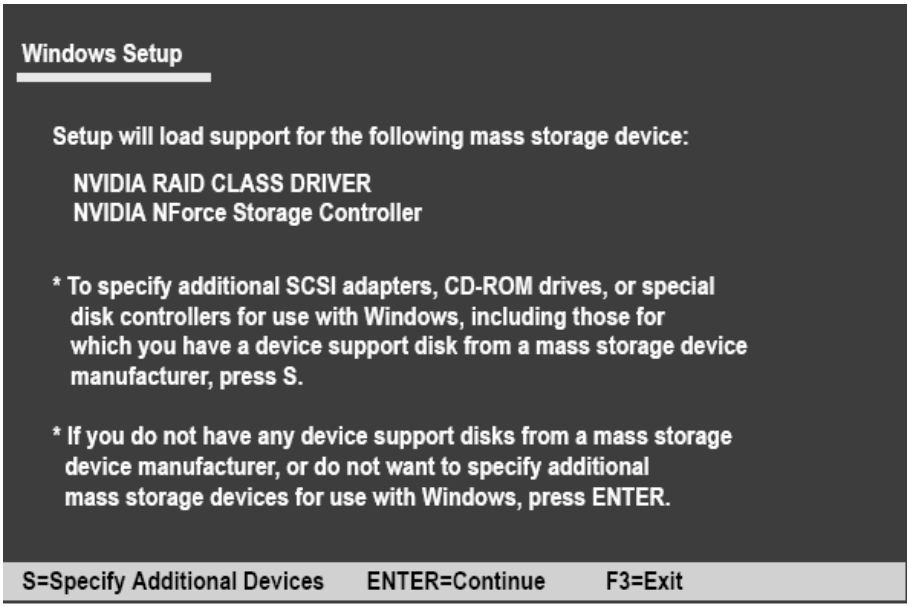
Windows Setup: Specify additional devices

Insert your F6 SATA RAID disk and choose *S (for Specify Additional Devices)*. You will be prompted to choose the appropriate driver.



Windows Setup: Driver selection

First select *NVIDIA RAID CLASS DRIVER (required)* and press Enter. Press *S* again at the *Specify additional devices* screen. Now select *NVIDIA NForce Storage Controller (required)* and press enter. Afterwards the Windows setup screen appears, listing both drivers.



Windows Setup: Driver listing

If both drivers are listed as shown, continue installing Windows by pressing Enter. Follow the installation instructions of Windows.

Initialization of RAID array

After the successful installation of Windows, the RAID array has to be initialized by opening the Computer Management. Click Disk Management (under the Storage section) and the Initialization wizard will appear.

Windows Initialization Wizard

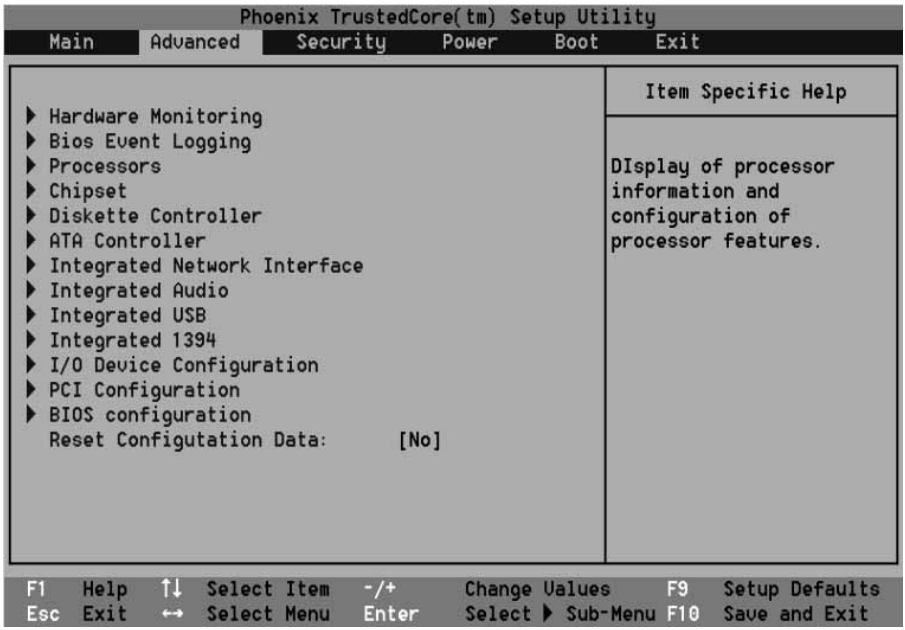
Follow the instructions of the wizard and if desired the array could be converted to a dynamic disk.

Configuration and Installation of a non-bootable RAID array

Configuration of System BIOS

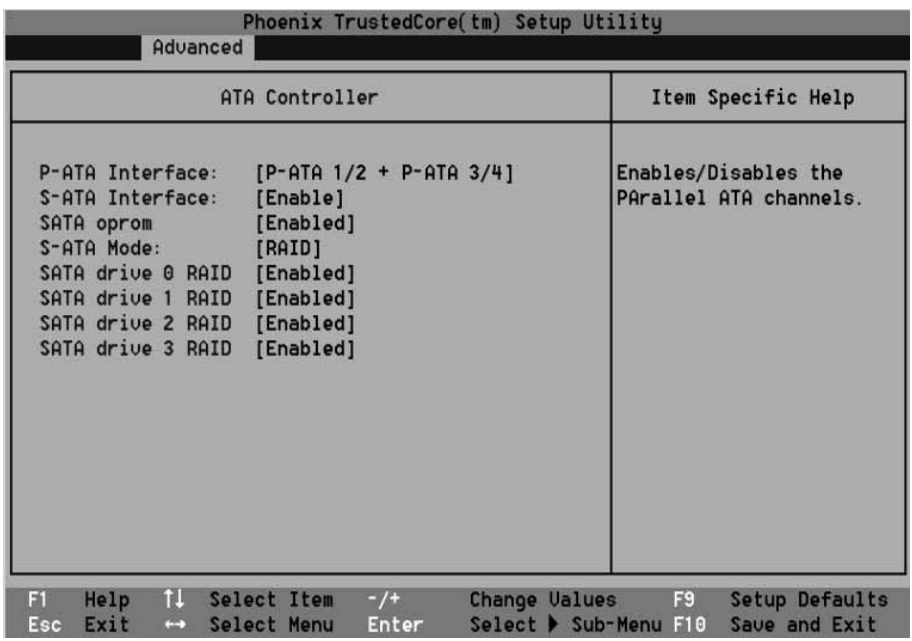
In System BIOS setup RAID has to be enabled and intended disks have to be selected for RAID use.

Start your system and press *F2* to enter BIOS setup menu. After BIOS setup menu has called, choose the menu *Advanced* by using the arrow keys.



BIOS setup menu Advanced

Use the arrow keys to select *ATA controller* and press Enter



BIOS setup menu *ATA Controller*

Enable SATA RAID by changing the value of *S-ATA Mode* to *RAID*. Afterwards set the value for *SATA drive x RAID* to *Enabled* for all disks you want to use as RAID disks. At the end press *F10* to save and exit BIOS setup menu. The system will reboot.

Configuration of NVIDIA RAID BIOS

After configuration of the System BIOS the RAID array type and the usage of the disks have to be chosen in NVIDIA RAID BIOS.

During boot of your computer you will be prompted to press F10 to enter NVIDIA RAID BIOS Utility. The prompt is appearing during System BIOS POST.

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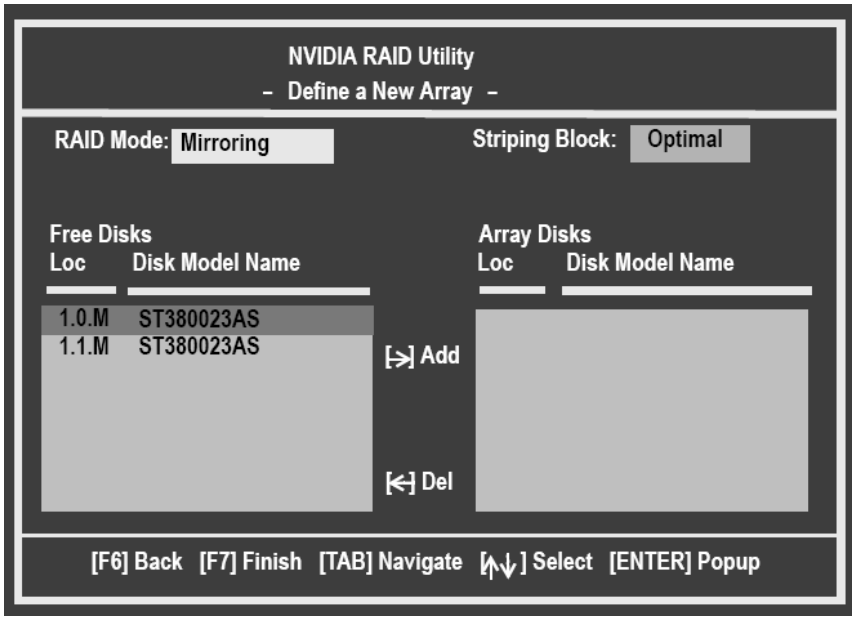

NVidia RAID utility: *Define a New Array*

Following should be done to define a new array:

- Select the RAID mode

  By default, this is set to Mirroring. To change to a different RAID mode, press the down arrow key until the mode that you want appears in the RAID Mode box—either Mirroring, Striping, or Stripe Mirroring.

- Set up the Striping Block

  Striping block size is given in kilobytes, and affects how data is arranged on the disk. It is recommended to leave this value at the default Optimal, which is 64KB, but the values can be between 4 KB and 128 KB (4, 8, 16, 32, 64, and 128 KB).

- Specify which disks to use for the RAID array

The disks that you enabled in System BIOS setup menu for RAID use appear in the Free Disks block. These are the drives that are available for use as RAID array disks. The Loc column of the Free Disks block shows the SATA port to which the drive is attached to.

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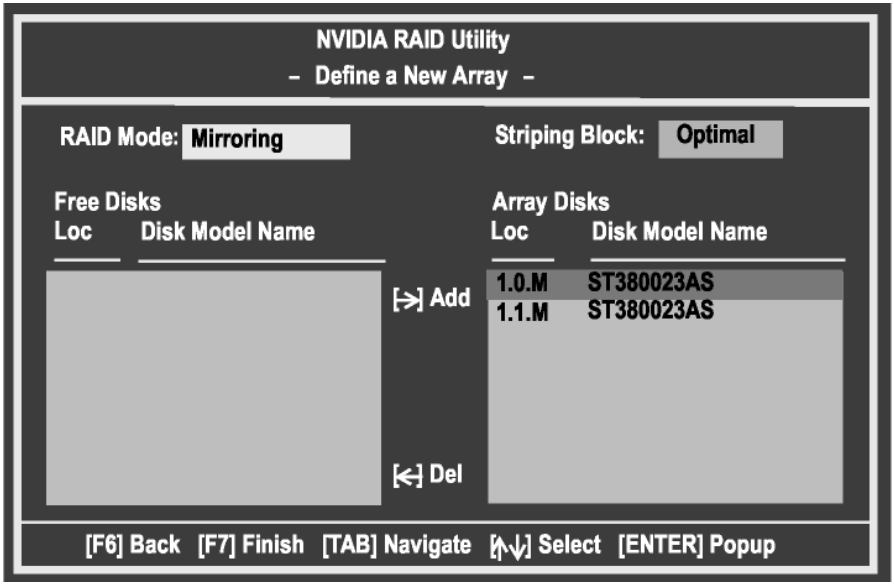
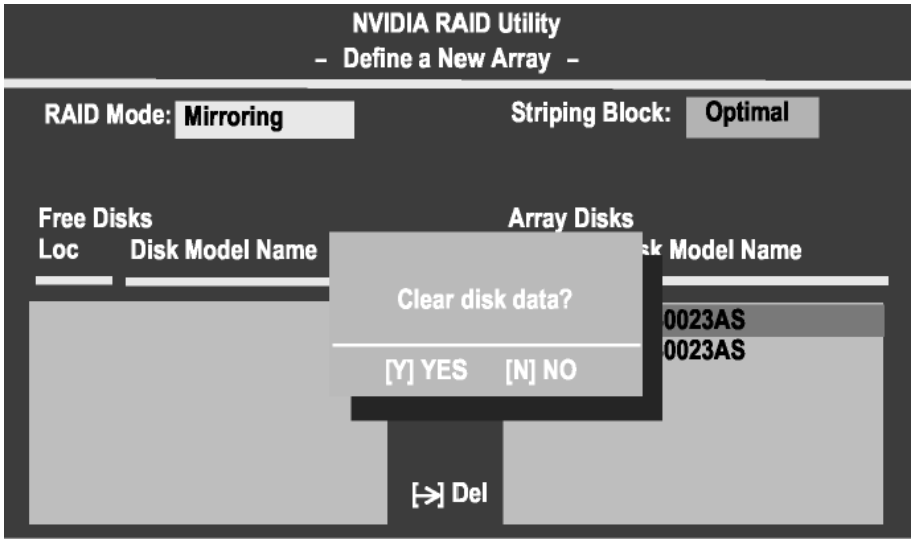
To designate a free disk to be used as a RAID array disk, tab to the Free Disks section.
The first disk in the list is selected. Move it from the Free Disks block to the Array Disks block by pressing the right-arrow key. The first disk in the list is moved, and the next disk in the list is selected and ready to be moved. Continue pressing the right-arrow key until all the disks that you want to use as RAID array disks appear in the Array Disks block.



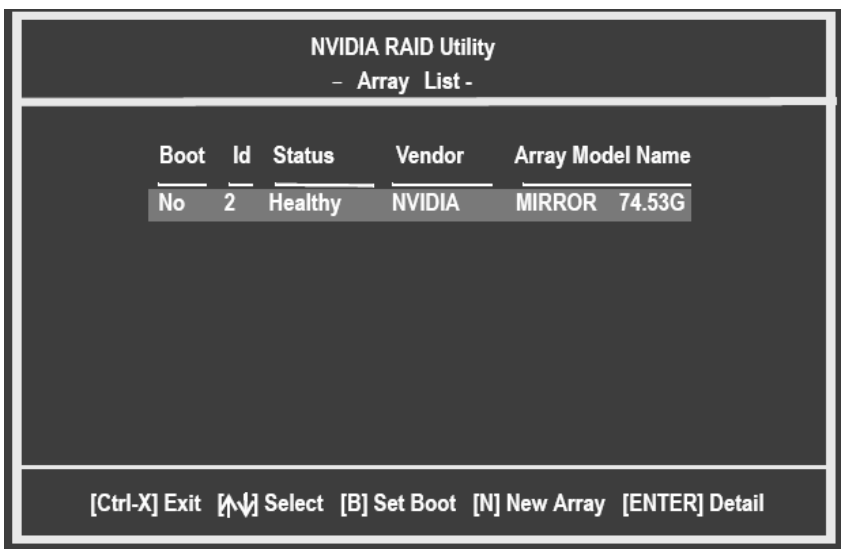
NVidia RAID utility: *Array Disks assigned*

- Completing the RAID BIOS Setup
  After assigning all RAID array disks, press *F7* to finish your setup process. You will be prompted to clear your disk data. Press *Y* to clear data of the drives you have assigned for RAID array use.



NVidia RAID utility: *Clear Disk Data prompt*

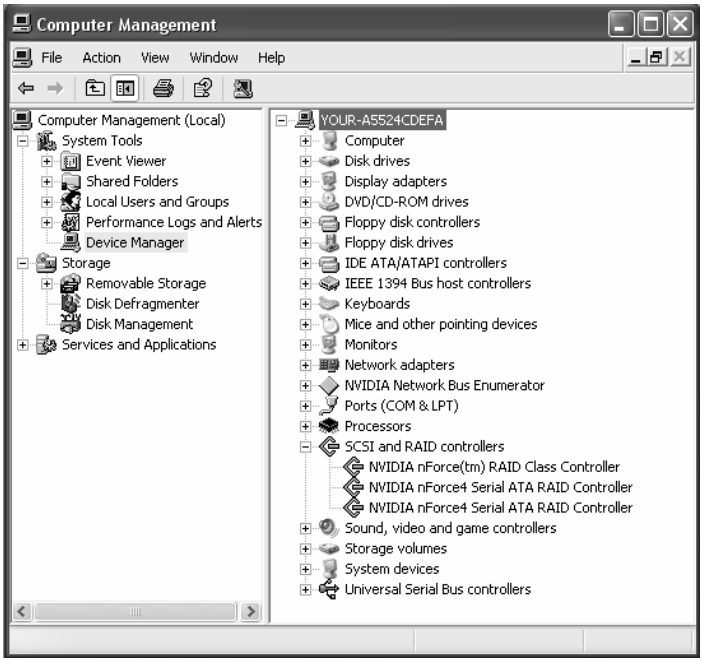
Afterwards the created array will be shown at the screen. Details of the array will be shown by selecting the array and pressing Enter.



NVidia RAID utility: *Array list*

Installation of NVIDIA RAID driver

Driver could be installed either by using NVidia setup or manually. If manual installation is chosen, all NVidia SATA drivers have to be installed.



Windows Device Manager: SATA RAID drivers

Initialization of RAID array

After the successful installation of the driver, the RAID array has to be initialized by opening the Computer Management. Click Disk Management (under the Storage section) and the Initialization wizard will appear.

Windows Initialization Wizard

Follow the instructions of the wizard and if desired the array could be converted to a dynamic disk.

Spare Drives

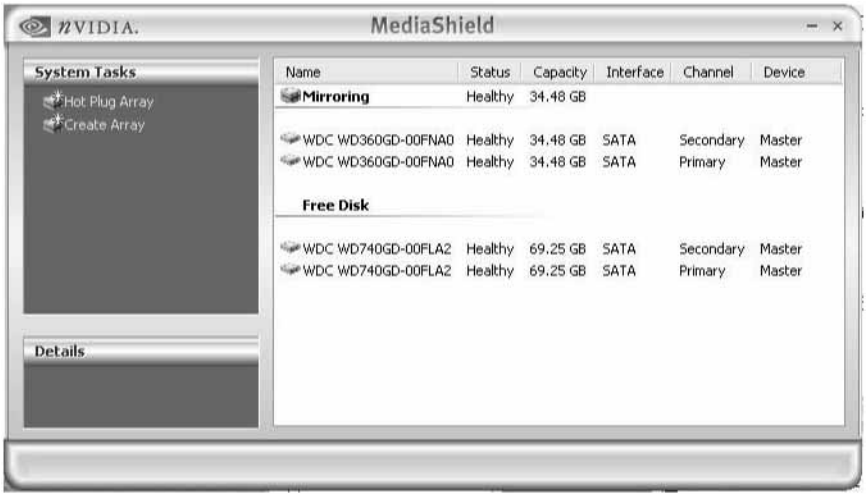
You can designate a hard drive to be used as a spare drive for a RAID 1 array. The spare drive, which is called free disk, can take over for a failed disk. The disk is not part of any RAID array, but can be used by an available RAID 1 array that requires a particular disk when one of its disks crashes or becomes unusable. The process is automatic and doesn't require any user interaction.

For example, if you have a system with four hard disks where one disk is used to boot the OS, two hard drives are set up in a mirrored array, and a fourth hard disk is set up as a free disk, then if one of the mirrored array drives fails, the free disk will be automatically assigned to the mirrored array to be used instead of the failed disk.

To configure a free disk, enable RAID for the particular drive in System BIOS. Enter the NVIDIA RAID BIOS utility and make sure that the drive, which is intended to be a free disk, is not part of an array.

Windows NVIDIA RAID utility "NVRAIDMAN"

It is also possible to view and change the RAID configuration with the Windows utility NVRAIDMAN. The utility is delivered with the Chipset driver package and can be found in the directory *IDE/WinXP/raidtool*.



NVIDIA RAIDMAN utility