

# VIA VT6410/VT6420/VT6421 PATA/SATA RAID controller

## Installation Guide in Mandrake Linux 9.2

Version 0.8, April 2, 2004

Copyright © 2003, 2004 VIA Technologies, INC.

### 1. Summary

This guide describes how to install the driver and utility of the VT6410 (IDE/ RAID controller), VT6420 (Serial ATA/RAID controller, compliant device for VT8237 south bridge) and VT6421 (Serial ATA/RAID controller) in Mandrake Linux 9.2. These three chips support RAID Level 0, RAID Level 1, RAID Level 0+1 and JBOD. The RAID introduction is described in detail at the “Appendix” section. The information in this document is provided “AS IS,” without guarantee of any kind.

### 2. File description

This package requires 2 files as described below.

|          |       |           |                                  |                |
|----------|-------|-----------|----------------------------------|----------------|
| 04-12-04 | 18:08 | 2,281,263 | VIA_RAID_Linux_V100_20040412.zip | driver package |
|          |       |           | Readme                           | this file      |

Users are recommended to download the RAID Linux Combo Driver Binary in VIA Arena at <http://www.viaarena.com/?PageID=297>

### 3. Prepare a Driver Disk prior installing OS

Before using the PATA/SATA RAID controller function, make sure the VT6410/ V6420/VT6421 RAID BIOS integrates with the system BIOS. If not, update the system BIOS from your motherboard vendor.

Before installation, users need to create a driver disk to update Mandrake Linux 9.2. Insert a blank floppy disk with VFAT format and follow the steps below to generate the driver disk.

```
# unzip VIA_RAID_Linux_V100.zip
# cd VIA_RAID_Linux_V100/driver/
# mount /dev/fd0 /mnt/floppy
# cp patch.pl /mnt/floppy
# make
# cp viamraid.o /mnt/floppy/viamraid_up.p
# make clean
# make -e NOMODVER=1
```

```
# cp viamraid.o /mnt/floppy/viamraid_BOOT.o
# umount /mnt/floppy
```

The package also provides pre-compiled drivers in **driver/DriverDisk/Mandrak9.2** directory. User can copy those three files to floppy directly then install Mandrake Linux 9.2 by following next section.

Note: The package also can run on other Linux distributions, please refer to “**driverdisk.txt**” and “**ReadMe.txt**” files for more information.

#### 4. Install Mandrake Linux 9.2

After preparing the driver disk, users are ready to install Mandrake Linux 9.2. When booting from the installation CD, press “**F1**” then type the following command when the “**boot:**” message appears on the screen.

```
boot:patch
```

Then follow the instructions to install Mandrake Linux 9.2.

#### 5. Install precompiled PATA/SATA RAID driver binary on an existing Mandrake Linux 9.2 system

The package provides pre-compiled binary driver for user to install. Install the driver by following the commands below:

```
# cd VIA_RAID_Linux_V100/driver/bin/Mandrake/9.2
# cp viamraid.o /lib/modules/2.4.22-10mdk/misc
# depmod -a
# modprobe viamraid
```

After loading the driver module, it will show the message below on the screen.

```
warning: loading /lib/modules/2.4.22-10mdk/misc/viamraid.o will taint the kernel: no license
See http://www.tux.org/lkml/#export-tainted for information about tainted modules
Linux driver version 1.00
```

Users also can run “**dmesg**” command to check the PATA/SATA HDD is workable or not.

```
Vendor:          Model:          Rev:
Type:   Direct-Access          ANSI SCSI revision: 00
Attached scsi disk sda at scsi0, channel 0, id 0, lun 0
SCSI device sda: 156301487 512-byte hdwr sectors (80026 MB)
Module viamraid loaded, with warnings
```

If user wants the system to load the RAID Combo module automatically when system boots up, edit the “/etc/rc.d/rc.local” file and add the line as below:

```
modprobe viamraid
```

## 6. Compile VIA's RAID driver package

Users can also compile the driver by themselves. Please use the following commands:

```
# cd VIA_RAID_Linux_V100/driver
# make ; make install
```

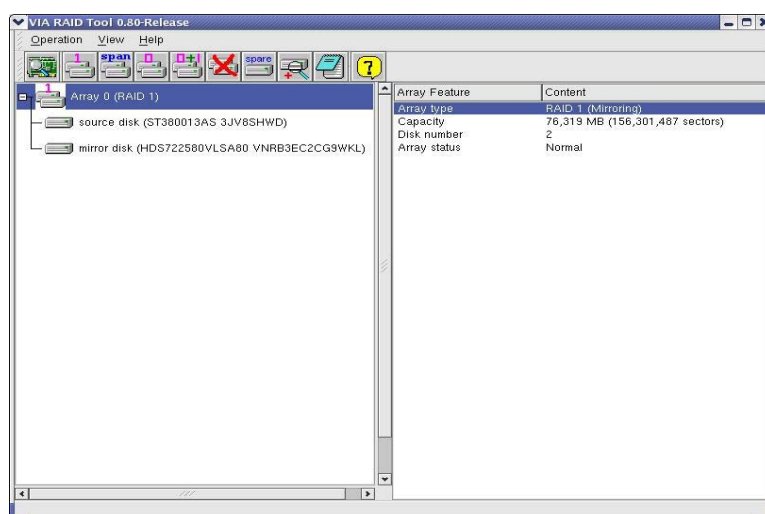
After installing the driver, users should see the same message as section 5.


## 7. Install VIA RAID utility

The package also provides a GUI utility for user to control the RAID card easily. Use the following commands to install and run the VIA RAID utility:

```
# cd VIA_RAID_Linux_V100/utility
# ./install.sh
Please specify the base directory to install the files. [/usr/local]
Starting install VIA Raid Tool for Linux, please wait...
```

VIA Raid Tool has been installed successfully.  
Before run it, you must install the driver first.  
And the executable file is viaraid-gtk under /usr/local/bin  
# viaraid-gtk



Users can click  button for more information about the VIA RAID Tool.

## 8. Verify the success of installation

Run the following commands to verify if the device works, assuming there is a “**test.txt**” file in PATA/SATA Hard Disk which is mounted at /HDD.

```
# cp /HDD/test.txt /  
# diff /text.txt /HDD/test.txt
```

If there shows nothing after running the “**diff**” command, it means the two files are identical. And the PATA/SATA Hard Disk should work properly. And the following table shows the success of RAID functions of the VIA RAID controllers on Mandrake Linux 9.2.

|          | VT6410 | VT6420 | VT6421 |
|----------|--------|--------|--------|
| RAID 0   | PASS   | PASS   | PASS   |
| RAID 1   | PASS   | PASS   | PASS   |
| RAID 0+1 | PASS   | N/A*   | PASS   |
| JBOD     | PASS   | PASS   | PASS   |

Note: Because the test MB has only two Serial ATA ports layout, so the RAID Level 0+1 function does not test in this document.

## 9. Test configuration

The following hardware configurations were used for test.

### A. VT6410

|              |  |
|--------------|--|
| Mother Board | VT8190B (KT400A+VT8235+VT6410)   |
| CPU          | AMD Duron 950 MHz  |
| HDD          | WD WD200BB-00DGA0 20GB HDD*2<br>Quantum LM30000AT 30G HDD, LM20500AT 20G HDD |

### B. VT6420/VT8237

|              |   |
|--------------|---|
| Mother Board | VT8185D-3 (KM400+VT8237)  |
| CPU          | AMD Duron 950 MHz   |
| S-ATA HDD    | Seagate ST380013AS 80GB HDD<br>Hitachi HDS722580VLSA80 80GB HDD |

### C. VT6421

|              |   |
|--------------|---|
| Mother Board | VT5818B (PM800+VT8237)  |
| CPU          | Intel P4 1.6GHz   |
| Add-on Card  | VT5789B (VT6421)  |
| S-ATA HDD    | Seagate ST380013AS 80GB HDD<br>Hitachi HDS722580VLSA80 80GB HDD |
| HDD          | WD WD200BB-00DGA0 20GB HDD*2                                    |

## Appendix

### A. RAID 0 (Striping)

Reads and writes sectors of data interleaved between multiple drives. When any disk member fails, it affects the entire array. The disk array data capacity is equal to the number of drive members times the smallest member capacity. The striping block size can be set 4KB to 64KB. RAID 0 does not support fault tolerance.

### B. RAID 1 (Mirroring)

Writes duplicate data on to a pair of drives while reads are performed parallel. If one of the mirrored drives suffers a mechanical failure or does not respond, the remaining drive will continue to function. Due to redundancy, the drive capacity of the array is the capacity of the smallest drive. Under a RAID 1 setup, an extra drive called “spare drive” can be attached. Such a drive will be activated to replace a failed drive that is part of a mirrored array. Due to the fault tolerance, any one drive of RAID 1 failing does not impact the data access.

### C. JBOD (Spanning)

A spanning disk array is equal to the sum of the all drives when the drives used are different capacities. Spanning stores data on to a drive until it is full then proceeds to store files onto the next drive in the array. When any disk member fails, the failure affects the entire array. JBOD is not a really RAID and does not support fault tolerance.