

# Red Hat Linux 9 VT6410/VT6420/VT6421 PATA/SATA RAID

## Controller Installation Guide

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### 1. Summary

This guide describes how to install the RAID 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 Red Hat Linux 9.0. 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 descriptions

This package requires 2 files as described below.

VIA_RAID_Linux_V100.zip	03-22-04 13:58	2,078,556	driver package
Readme.doc			this file

User can obtained the VIA Raid Linux Driver from VIA Arena at the URL  
<http://www.viaarena.com/?PageID=297#raid>

### 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 installing the OS, users need to create a driver disk to update Red Hat Linux 9. Insert a blank floppy disk and follow the steps below to generate the driver disk.

- Decompress the driver package

```
# unzip VIA_RAID_Linux_V100.zip
# cd VIA_RAID_Linux_V100/driver/
# ln -s /usr/src/linux-2.4.20-8 /usr/src/linux
# ./dd.sh'
```

- Execute the command to create driver disk

```
# dd if=driverdisk/viamraid.img of=/dev/fd0
```

The package also provides two precompiled image files in driver/RedHat9.0 directory. The “**viamraid.img**” is for Intel P3/P4, AMD Duron/K7 and VIA Nehemiah CPUs, and the other “**c3-viamraid.img**” is for VIA C3 CPU.

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

#### 4. Install Red Hat Linux 9.0 on SATA/PATA HDD by using driver disk

After preparing the driver disk, users are ready to install Red Hat Linux 9.0. When booting the installation CD, type the following command when the “**boot:**” message appears on the screen.

```
boot:linux expert
```

A window “**Driver disk**” will prompt, then insert the driver disk and press “**Yes**”. Then, a window “**Driver Disk Source**” will prompt, select “**fd0**” and press “**OK**”. Then, another window “**Insert Driver Disk**” will prompt, press “**OK**” to proceed. After completing the driver loading, a window “**More Driver Disks**” will prompt, press “**No**”, then users are allowed to proceed with normal installation.

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

The package provides two pre-compile binary drivers for user installation. The “**viamraid.o**” is for Intel P3/P4, AMD Duron/K7 and VIA Nehemiah CPUs, and the other “**c3-viamraid.o**” is for VIA C3 CPU. Install the driver by the commands below.

```
# cd VIA_RAID_Linux_v100/driver/bin
# cp viamraid.o /lib/modules/2.4.20-8/kernel/drivers/scsi
# depmod -a
# modprobe viamraid
```

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

```
warning: loading /lib/modules/2.4.20-8/kernel/drivers/scsi/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 upon system boot, edit the “**/etc/rc.d/rc.local**” and add a line below.

```
modprobe viamraid
```

## 6. Compile VIA’s driver package

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

```
# cd VIA_RAID_Linux_V100/driver
# ln -s /usr/src/linux-2.4.20-8 /usr/src/linux
# make ; make install
```

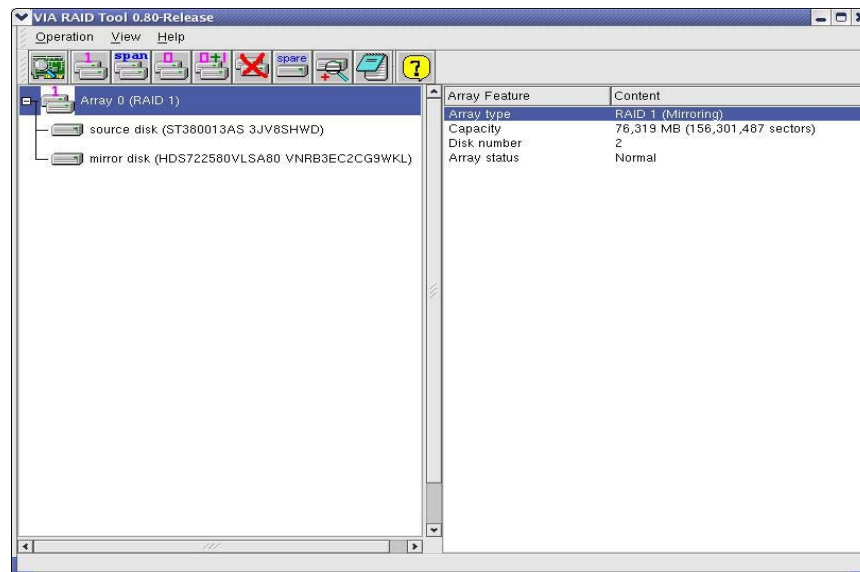
After installing the driver, users should see the message on the screen as loading driver in section 5.


## 7. Install VIA RAID utility

The package also provides a GUI tool for user to control the RAID card easily. Execute the following command 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 /test.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 Red Hat Linux 9.0.

	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	VT5814B (CN400+VT8237)
CPU	VIA C3 933MHz
Add-on Card	VT5689A (VT6410)
HDD	WD WD200BB-00DGA0 20GB HDD*2

Mother Board	VT8190B (KT400A+VT8235+VT6410)
CPU	AMD Duron 850MHz
HDD	WD WD200BB-00DGA0 20GB HDD*2 Maxtor 4G160J8 160GB HDD, Maxtor 6E0300L 30GB HDD

### B. VT6420

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

### C. VT6421

Mother Board	VT5814B (CN400+VT8237)
CPU	VIA C3 Nehemiah 1.2 GHz
Add-on Card	VT5789B (VT6421)
S-ATA HDD	Seagate ST380013AS 80GB HDD 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.