VIA Ubuntu Linux 7.04 Desktop/alternate (x86&x86_64) VT8237R/VT8237A/VT8237S/VT8251/CX700/VX800 V-RAID V3.10 Driver Installation Guide

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1. Summary

This guide describes how to install the VIA V-RAID driver v3.10 and utility of chipsets VT8237R/VT8237A/VT8237S/VT8251/CX700/VX800 (Serial ATA RAID controller) with Ubuntu Linux 7.04 Desktop/alternate. These six chips all support RAID Level 0, RAID Level 1 and JBOD. RAID Level 0+1 and RAID Level 5 are supported by VT8251. 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.

Note: To avoid the user account permission issue, following commands in this document all run with super user "root".

2. File descriptions

This package requires 3 files as described below.

V_RAID_3.10_ubuntu704.run	07-10-26 15:43 4,443,778	Ubuntu 7.04 V-RAID driver/utility binary
ubuntu704_v310_DD.img	07-10-24 16:51 1,474,560	Ubuntu 7.04 V-RAID driverdisk
Readme.doc		this file

3. Install precompiled VIA V-RAID driver binary on an existing Ubuntu 7.04 Desktop/alternate system with IDE HDD

Before using the RAID function of SATA controller, users need to check first:

a. The supported kernel version of precompiled VIA V-RAID driver binary is "**2.6.20-15-generic (x86/x86_64)**".

b. Please make sure the RAID BIOS of VT8237R/VT8237A/VT8237S/VT8251/CX700/VX800 integrates with the system BIOS. And users can create RAID HDD by RAID BIOS. If not, update the system BIOS from the motherboard vendor.

c. SATA Controllers whether set as **[RAID] Mode** in system BIOS. If not, please refer following steps to change it:

(For Award BIOS) Press **"DEL"** button to get into BIOS ➔ Integrated Peripherals ➔ VIA OnChip IDE Device ➔ SATA Controller Mode ➔ [RAID]

(Maybe name of bios item is different, users should be able to find similar item in bios)

Chipset	BIOS Mode Setting	Device ID	Module Name (viamraid.ko)
VT8237R(Plus)	RAID	0x3149	**V**
VT8237A	RAID	0x0591	**V**
VT8237S	RAID	0x7372	**V**
VT8251	RAID	0x3349	**V**
CX700(M/M2)	RAID	0x0581	**V**
VX800	RAID	0x0581	**V**

The VIA V-RAID package provides pre-compile binary drivers for user installation. Please refer following steps to install VIA V-RAID driver binary and RAID utility.

Note: Before uninstalling RAID driver, users need to umount all RAID partition in system.

```
#sh V_RAID_3.10_ubuntu704.run

Verifying archive integrity... All good.
Uncompressing VIA V_RAID Driver v3.10 Installation/Uninstall
program.....

Please choose the job you want to do:
1. Install RAID driver/Utility
2. Uninstall RAID driver/Utility
```

Users can select [1] install/[2] uninstall RAID driver/Utility.

After install RAID driver completely, users also can run "**`dmesg`**" command to check the RAID HDD is workable or not.

```
viamraid: module license 'unspecified' taints kernel.
GSI 20 sharing vector 0xC9 and IRQ 20
ACPI: PCI Interrupt 0000:00:0f.0[B] -> GSI 21 (level, low) -> IRQ 20
PCI: Via IRQ fixup for 0000:00:0f.0, from 11 to 4
PCI: Setting latency timer of device 0000:00:0f.0 to 64
scsi0 : VIAMRAID DRIVER 3.12
  Vendor: VIA AHCI  Model:  RAID 1          Rev:
  Type:   Direct-Access                    ANSI SCSI revision: 00
SCSI device sda: 390721967 512-byte hdwr sectors (200050 MB)
……
……
sda: assuming drive cache: write through
 sda: sda1 sda2
sd 0:0:0:0: Attached scsi disk sda
```

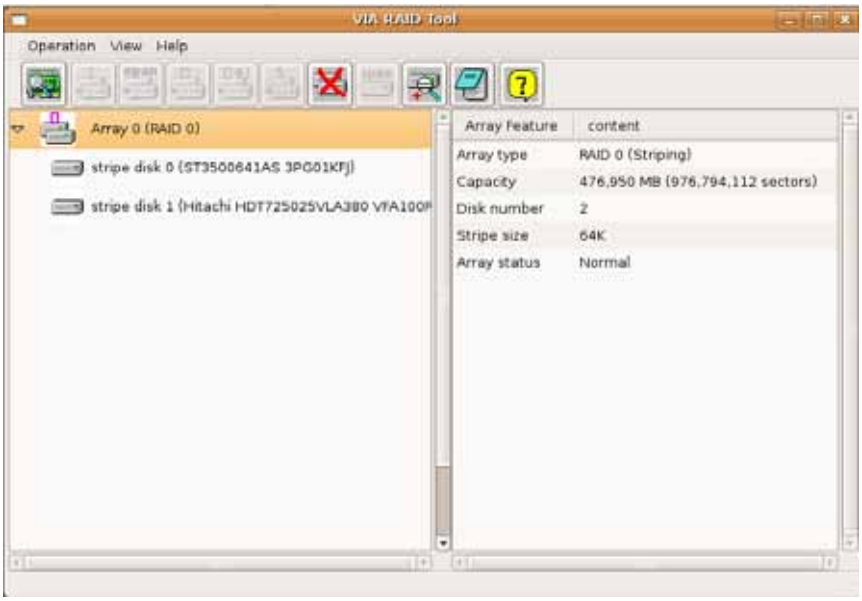
4. VIA RAID utility

Before using VIA RAID utility, users need to install related package: **libgtkmm2.4-dev**. Users can refer following commands to install it.

```
#apt-get update
#apt-get install libgtkmm-2.4-dev
```

Before running VIA Raid Tool, users need to install the raid driver first. And the executable file is "**viaraid"** under /usr/local/bin

```
#viaraid
```



Users can click  button for more information about how to create RAID mode with the VIA RAID Tool.

Note: When users "Create RAID Array" or "Remove Array" and system shows "Reinstall driver failed" message then RAID utility exit automatically, users need to umount partition of RAID HDD first and run RAID utility again.

5. Install OS Ubuntu 7.04 Desktop/alternate upon RAID HDD

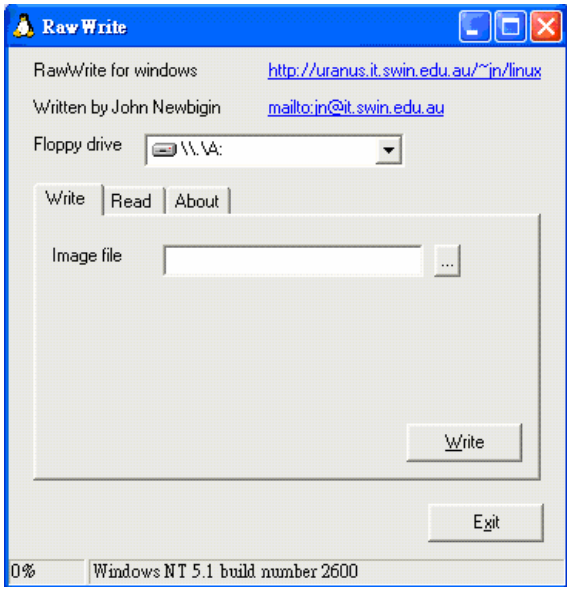
A. Prepare driverdisk prior installing OS

Before installing OS, users need to create a driver disk first. Insert a blank floppy disk and follow the steps below to generate the driver disk.

- **For window OS users:**

  Utility "**rawwritewin.exe**" can create driverdisk and it can be found in following download link http://www.chrysocome.net/downloads/rawwritewin-0.4.zip.

Users can copy driverdisk image **ubuntu704_v310_DD.img** to windows system. Press icon "**…**" to select image path then press "**Write**" button to create driverdisk.



➢ **For Linux OS users:**

Users can use command "**dd**" to create driverdisk under linux OS. Please refer following command:

```
#dd if=ubuntu704_v310_DD.img of=/dev/fd0
```

After driverdisk creates completely, users can prepare to install new system.

B. Install Ubuntu 7.04 Desktop/alternate upon RAID HDD by using driver disk

Note: If users install OS Ubuntu 7.04 with CX700(M/M2)/VX800 or SATA DVD-ROM, it is recommended to install with Ubuntu 7.04 alternate version.

Insert the driverdisk to floppy and boot from CD/DVD ROM to start install OS procedure.

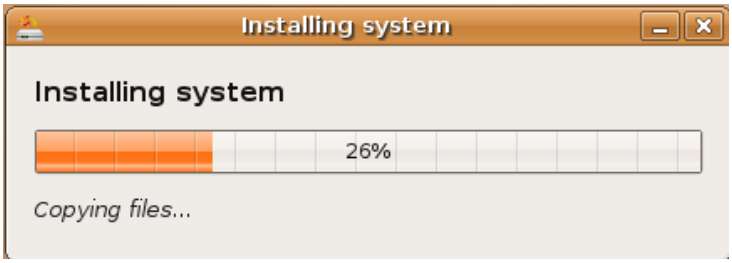
➢ **For installing Ubuntu 7.04 Desktop Version users:**

Due to the Ubuntu 7.04 Desktop Version is a Live CD. System can boot into Ubuntu OS with the Live CD first then load VIA RAID Driver manually to recognize RAID HDD. Please refer following commands to load VIA RAID Driver.

```
#cp /media/disk/* /tmp –rf (Assume floppy or USB floppy is mounted with
/media/disk automatically)
```

```
#sync
#cd /tmp
#umount /media/disk
#modprobe usb-storage –r (For USB Floppy)
#./viamraid_ubuntu704_install
```

After driverdisk creates completely, users can prepare to install new system upon RAID HDD by double click "**install**" icon. And install OS Ubuntu Linux 7.04 with normal step until system "**Installation complete**" message appeared.



When "**Installation complete**" message appeared, users can run following commands to copy VIA RAID Driver to installed system.

```
#cd /tmp
#cp viamraid_ubuntu704_install 2.6.20-15-generic /target/tmp -rf
#chroot /target
#cd /tmp
#./viamraid_ubuntu704_install
```

After updating VIA RAID Driver to installed system, users can press button "**Restart Now**" to restart system.

- **For installing Ubuntu 7.04 alternate Version users:**

When installation screen appeared, users can select item of "**Install in text mode**" to install OS. After choosing one item to install and waiting for "**Choose language**" screen appeared, please press button "**Alt+F2**" to switch to console mode and refer following commands to load VIA RAID driver from driverdisk.

```
#modprobe ext2
#mount /dev/fd0 /floppy
#mount /dev/sdx /floppy (For USB Floppy, sdx maybe sda, sdb or sdc...)
#cp /floppy/* /tmp –rf
#sync
#cd /tmp
#./viamraid_ubuntu704_install
```

If driver loaded successfully, user can see the RAID HDD information in other screen. **(Please press button Alt+F4)**

```
Viamraid: module license `unspecified` taints kernel.
ACPI: PCI Iterrupt 0000:05:08.0[A] -> GSI 16 (level, low) -> IRQ 20
```

```
sata_via 0000:05:08.0: routed to hard irq line 11
……
……
scsi1 : VIAMRAID DRIVER V3.12
Vendor: VIA AHCI       Model: RAID 1     Rev:
Type: Direct-Access                      ANSI SCSI revision: 00
```

After driver loaded and RAID HDD can be recognized successfully, users can press button "**Alt+F1**" to return to OS installation screen and install OS Ubuntu Linux 7.04 with normal step until system "**Install complete**" message appeared.

When system install complete message appeared, users can press button "**Alt+F2**" to switch console mode again and refer following commands to copy VIA RAID Driver to installed system.

```
#cd /tmp
#cp viamraid_ubuntu704_install 2.6.20-15-generic /target/tmp -rf
#chroot /target
#cd /tmp
#./viamraid_ubuntu704_install
```

After updating VIA RAID Driver to installed system, users can press button "**Alt+F1**" to return to OS installation screen to select "**Continue**" to restart system.

If users forget to copy VIA RAID Driver to installed system, users may meet system hang issue after system reboot. Users can refer following steps to rescue it:

a. Insert the driverdisk to floppy and boot from **Ubuntu 7.04 alternate** CD ROM to start install OS procedure.

b. Users can select item "**Rescue a broken system**" to boot.

c. Refer the Section 5.B "**For installing Ubuntu 7.04 alternate users**" part to load VIA RAID Driver first.

d. After loading VIA RAID Driver complete, users can press button "**Alt+F1**" to return to rescue mode screen.

e. OS Install shell will ask users "**Choose language**" ➔ Select "**Go Back**" ➔ Show message "**Ubuntu installer main menu**" ➔ Select "**Load installer components from CD**" ➔ Show message "**Configure the network**" ➔ Select "**Continue**" ➔ Show message "**Enter rescue mode**" ➔ Select "**/dev/sda1" (Assume OS is installed at /dev/sda1)** ➔ "**Rescue operations**" ➔ Select "**Execute a shell in the installer environment**" ➔ Show message "**Executing a shell**" ➔ Select "**Continue**" ➔ System will appear the console command line and **/dev/sda1 should be mounted at /target**.

```
#cp viamraid_ubuntu704_install 2.6.20-15-generic /target/tmp -rf
#chroot /target
#cd /tmp
#./viamraid_ubuntu704_install
```

f. After running VIA RAID Driver update shell and new boot image creates successfully, users can reboot system and boot system with new boot image.

After booting into Ubuntu 7.04 upon RAID HDD, users can install RAID utility to manage RAID HDD. Please refer following steps to install VIA V-RAID utility.

```
#sh V_RAID_3.10_ubuntu704.run

Verifying archive integrity... All good.
Uncompressing VIA V_RAID Driver v3.10 Installation/Uninstall
program.....

Please choose the job you want to do:
1. Install RAID Utility
2. Uninstall RAID Utility
```

Users can select [1] install/[2] uninstall RAID Utility.

6. Verify the success of installation

Assume file "**test.txt**" in RAID Hard Disk which is mounted at /HDD. Run the following commands to verify if the device works.

```
# 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 RAID Hard Disk should work properly. And the following table shows the success of RAID functions of the VIA RAID controllers on Ubuntu Linux 7.04.

RAID Controller / Tested HDD	CX700 (M/M2)	VX800	VT8237R Plus	VT8237A	VT8237S	VT8251
RAID 0	PASS	PASS	PASS	PASS	PASS	PASS
RAID 1	PASS	PASS	PASS	PASS	PASS	PASS
RAID 0+1	N/S	N/S	N/S	N/S	N/S	PASS
RAID 5	N/S	N/S	N/S	N/S	N/S	PASS
JBOD	PASS	PASS	PASS	PASS	PASS	PASS

Note1: Following listed is each RAID controller supports SATA port numbers:

VT8237R/VT8237A/VT8237S/CX700(M/M2)/VX800 supports 2 SATA ports.

VT8251 supports 4 SATA ports.

Note2: When BIOS setting changes to RAID Mode and install OS with CX700/VX800, users need to install OS via a driverdisk.

7. Test configuration

The following hardware configurations were used for test.

A. VT8237R/VT8237A/VT8237S

Mother Board	EPIA-CN13000 (CN700+VT8237R Plus)
CPU	VIA C7 1.3GHz
S-ATA/PATA HDD	SATA: WDC WD2000JS 200GB Hitachi HDT725025VLA38 250GB
IDE HDD	Maxtor 6B120P0 120GB

Mother Board	VT5935C-4 (CN896+VT8237A)
CPU	VIA C7 2GHz
S-ATA/PATA HDD	SATA: Hitachi HDT725025VLA38 250GB Seagate ST350064 500GB
IDE HDD	Maxtor 6B120P0 120GB

Mother Board	VT8498B-1 (K8M890+VT8237S)
CPU	AMD Athlon 64 Dual Core 4200+
S-ATA/PATA HDD	SATA: WDC WD2000JS 200GB Hitachi HDT725025VLA38 250GB
IDE HDD	Maxtor 6B120P0 120GB

B. VT8251

Mother Board	VT8435B-1 (K8M890+VT8251)
CPU	AMD Athlon 64 Dual Core 4000+
S-ATA/PATA HDD	SATA: Hitachi HDT725025VLA38 250GB WDC WD2000JS 200GB Seagate ST350064 500GB Hitachi HDT725025VLA38 250GB
IDE HDD	Maxtor 6B120P0 120GB

C. CX700(M/M2)

Mother Board	VT8454B-1 (CX700)
CPU	VIA C7 1.6GHz
S-ATA/PATA HDD	SATA: WDC WD2000JS 200GB Hitachi HDT725025VLA38 250GB

D. VX800

Mother Board	VT8515D (VX800)
CPU	VIA C7 1.5GHz
S-ATA/PATA HDD	SATA: WDC WD2000JS 200GB Hitachi HDT725025VLA38 250GB

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 umber 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 preformed 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. RAID 0+1 (Striping/Mirroring)

RAID 0+1 is a combination of RAID 0 and RAID 1 array types. A minimum of four drives needs to be installed. With a four-drive array, there must be two pairs of RAID 0 drives. Each pair mirrors the data on the other pair of striping drives. The data capacity is two times the smallest drive.

D. 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.