

Mandrake Linux 8.2 ATA/133 & ATA/100 Kernel Patch: VT82C686B, VT8231, VT8233, VT8233A, VT8233C, VT8235

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1. Summary

The Mandrake Linux 8.2 native IDE driver does not support the maximum possible data transfer mode of ATA/133 (Ultra DMA mode 6) for south bridge chips VT8233A and VT8235; ATA/100 (Ultra DMA mode 5) for VT82C686B, VT8231, VT8233, and VT8233C. This document provides a kernel patch and a step-by-step instruction to re-build the kernel, enabling the maximum possible data transfer speed in effect. The information in this document is provided “AS IS,” without guarantee of any kind.

2. File description

The package contains 2 files as described below.

ATA133-Linux-PatchFile-V20. ZIP	10,413	9-20-02	02:43
Readme.doc		this file	

Uncompress the zip file and you'll find 6 files. Only README.txt and mdk8.2-patch-2.4.18-vpide.gz are needed. Users are advised to download and use the latest patch, if applicable, at the web link <http://www.viaarena.com/?PageID=2>.

3. Native IDE driver problem

The following table summarizes whether to patch the native IDE driver and rebuild the OS kernel in order to support ATA/100 or ATA/133 mode for six different chips. All the chips require patch the kernel.

	Maximal UDMA mode supported natively	Patch IDE driver and rebuild kernel to support ATA/100 or ATA/133?
VT82C686B	ATA/100	Needed
VT8231	ATA/100	Needed
VT8233	ATA/100	Needed
VT8233A	ATA/33	Needed
VT8233C	ATA/33	Needed
VT8235	ATA/33	Needed

4. Prior to kernel patching

Before kernel patching, make sure the kernel source has been installed on the system. If you didn't import the kernel source during your first installation, you may install the kernel source anytime from the second installation CD by using "Package Manager". Alternatively, you may run "rpm -i kernel-source-xxx.rpm" to import the source.

WARNING: The patch file is only suitable for the default kernel 2.4.18-6mdk. If you use a different kernel version, the patch may not work properly.

For your information, the Linux kernel starts to support ATA/133 for VT8233A and VT8235, or ATA/100 for VT8231, VT8233, and VT8233C since the latest kernel version 2.5.x. Alternatively, you may download a suitable kernel from <http://www.kernel.org/> and upgrade your system to turn on the maximum possible data transfer speed.

5. How to patch

- (1) If you buy and use the original Mandrake Linux 8.2 distribution CDs, not those downloaded from the web site, an error message of "gcc: installation problem, cannot execute 'cpp0': No such file or directory" may occur when executing the "make install" command. This is because the GCC package is missing on those CDs. Thus, you may download the complete installation CD from Mandrake's web site or the GCC package directly from <http://rpm.pbone.net/>. Then, run the following command to install the GCC package.

```
# rpm -i vh gcc-cpp-2.96-0.76mdk.i586
```

- (2) Login as "root" in the text mode, and follow the installation instruction in the "*readme.txt*" document for specific patching steps.
- (3) Run "*make menuconfig*" and select *ATA/IDE/MFM/RLL Support /IDE* and then *ATA and ATAPI Block devices*. Next, select 'y' to enable *Generic PCI bus-master DMA support*.

NOTE: if your system uses VIA C3 CPU, disable [*Symmetric multi-processing support*] under [*Processor type and features*] as well.

- (4) Save and exit the kernel configuration.
- (5) Before running "*make dep*", edit "*/usr/src/linux-2.4/Makefile*" and modify the

fourth line from “EXTRAVERSION= -6mdk” to “EXTRAVERSION= -6mdk-TEST”, in order to name the new kernel.

(6) Run “*make dep clean bzImage modules modules_install install*”

(7) Edit the “*/etc/lilo.conf*” file as below in order to allow users to select either the original or the newly built kernel to boot.

```
image=/boot/vmlinuz-2.4.18-6mdk
#the original is image=/boot/vmlinuz
label=linux
root=/dev/hda1
read-only
optional
append=" devfs=mount"
initrd=/boot/initrd-2.4.18-6mdk.img
#The original is initrd=/boot/initrd
```

6. Test result

(1) Success of kernel patching

Reboot the system and choose to boot “2418-6”, the newly built kernel. If using south bridge chip VT8235, after system reboot you should see the following boot message.

```
"VP_IDE: VIA vt8235 (rev 00) IDE UDMA133 Controller on pci 00:11.1"
```

Note the data transfer rate for VT8235 has changed to ATA/133 from ATA/33. Alternatively, you may read the message from the */var/log/dmesg* file.

(2) Data transfer speed

The following data transfer speed before and after kernel patching was measured by using the “*hdparm -t*”, and the sustained transfer rate of the disk reads from different systems.

	Original Kernel (MB/sec)	Patch IDE and rebuild Kernel (MB/sec)
VT82C686B	23.68	40.25
VT8231	23.70	28.96
VT8233	23.70	39.75
VT8233A	5.76	39.75
VT8233C	4.24	39.75
VT8235	6.31	39.75

7. Test configuration

The following tables list the hardware configurations used for test.

Main Board	VT5291E (PM133+VT82C686B)	VT5512B (VT8366+VT8233C)
CPU	VIA C3 933 MHz	AMD Duron 800 MHz
Memory	128 MB*2 SDRAM PC133	128 MB*2 DDR266
HDD	Maxtor 60G 7200rpm ATA/133	Maxtor 60G 7200rpm ATA/133

Main Board	VT5274C (PM133+VT8231)	VT5519F (KN266+VT8233)
CPU	VIA C3 900 MHz	AMD Duron 1 GHz
Memory	128 MB*2 SDRAM PC133	128 MB DDR266
HDD	Maxtor 60G 7200rpm ATA/133	Maxtor 60G 7200rpm ATA/133

Main Board	VT5617C1 (P4M266+VT8233A)	EPIA-M9000 (CLE266+VT8235)
CPU	Intel P4 1.8 GHz	VIA C3 933 MHz
Memory	128 MB DDR266	128 MB DDR266
HDD	Maxtor 60G 7200rpm ATA/133	Maxtor 60G 7200rpm ATA/133