

Install Ubuntu / Linux on a Dell Latitude D430

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<https://www.bortzmeyer.org/dell-latitude-d430-linux.html>

I installed the operating system Ubuntu/Linux on a Dell Latitude D430 laptop machine. This article is to share the information that I obtained during the process. While the basic functions are OK, there are problems. As often with laptops, especially very recent machines, a lot of things do not work, or do not work out of the box.

I hope I used only free software but I did not check thoroughly the licences.

This machine has the following hardware and, for each one, I indicate if it worked out of the box, or after manipulations :

- Broadcom Corporation NetXtreme BCM5752 Gigabit Ethernet network controller. Works out of the box. Tested at 100 Mb/s.
- Intel Corporation Mobile 945GM/GMS/940GM graphics card. Works out of the box at low resolution and at full resolution after.
- Wireless controller. Works, but only with a very recent kernel. It is an Intel Wireless WiFi 4965AGN, a very recent chipset.
- Sound card. Worked after a few mistakes.
- Ricoh R5C822 SD/SDIO/MMC/MS/MSPro memory card reader. Works with some extra (non-free?) kernel modules.
- An external CD/DVD reader/writer. Works out of the box.
- Power management system. Reporting from the battery works but suspend is highly unreliable when Wifi is running.
- PCMCIA. Not tested yet.
- Bluetooth controller, not tested yet.

Under Windows Vista, the System Information program (alias `msinfo32`) allows to gather all the hardware information about the machine. If you have such a legacy operating system on your hard disk, it is always a good idea to save it (the Export menu allows to save it as a text file) before the installation.

I put the Ubuntu 7.04 « feisty » CD-ROM in the external hard disk. Pressing F12 at startup gives access to the boot menu. Ubuntu starts, displays a graphical screen with an Install button. The questions are straightforward. I appreciate that, when you go back in the installation process, the answers you gave are remembered so you don't need to retype when restarting forward.

Here are some details about the machine, as seen by Linux. First, the hardware as seen by `lspci` :

```
00:00.0 Host bridge: Intel Corporation Mobile 945GM/PM/GMS/940GML and 945GT Express Memory Controller Hub (1
00:02.0 VGA compatible controller: Intel Corporation Mobile 945GM/GMS/940GML Express Integrated Graphics Controller
00:02.1 Display controller: Intel Corporation Mobile 945GM/GMS/940GML Express Integrated Graphics Controller
00:1b.0 Audio device: Intel Corporation 82801G (ICH7 Family) High Definition Audio Controller (rev 01)
00:1c.0 PCI bridge: Intel Corporation 82801G (ICH7 Family) PCI Express Port 1 (rev 01)
00:1c.1 PCI bridge: Intel Corporation 82801G (ICH7 Family) PCI Express Port 2 (rev 01)
00:1c.2 PCI bridge: Intel Corporation 82801G (ICH7 Family) PCI Express Port 3 (rev 01)
00:1d.0 USB Controller: Intel Corporation 82801G (ICH7 Family) USB UHCI #1 (rev 01)
00:1d.1 USB Controller: Intel Corporation 82801G (ICH7 Family) USB UHCI #2 (rev 01)
00:1d.2 USB Controller: Intel Corporation 82801G (ICH7 Family) USB UHCI #3 (rev 01)
00:1d.3 USB Controller: Intel Corporation 82801G (ICH7 Family) USB UHCI #4 (rev 01)
00:1d.7 USB Controller: Intel Corporation 82801G (ICH7 Family) USB2 EHCI Controller (rev 01)
00:1e.0 PCI bridge: Intel Corporation 82801 Mobile PCI Bridge (rev e1)
00:1f.0 ISA bridge: Intel Corporation 82801GBM (ICH7-M) LPC Interface Bridge (rev 01)
00:1f.1 IDE interface: Intel Corporation 82801G (ICH7 Family) IDE Controller (rev 01)
00:1f.3 SMBus: Intel Corporation 82801G (ICH7 Family) SMBus Controller (rev 01)
02:01.0 CardBus bridge: Ricoh Co Ltd RL5c476 II (rev b4)
02:01.1 FireWire (IEEE 1394): Ricoh Co Ltd R5C552 IEEE 1394 Controller (rev 09)
02:01.2 Generic system peripheral [0805]: Ricoh Co Ltd R5C822 SD/SDIO/MMC/MS/MSPro Host Adapter (rev 18)
09:00.0 Ethernet controller: Broadcom Corporation NetXtreme BCM5752 Gigabit Ethernet PCI Express (rev 02)
0c:00.0 Network controller: Intel Corporation Unknown device 4229 (rev 61)
```

And the CPU information (yes, laptops have dual core, now). Do note that Ubuntu's installed kernel has no problems with SMP :

```
processor : 0
vendor_id : GenuineIntel
cpu family : 6
model : 15
model name : Intel(R) Core(TM)2 CPU          U7600 @ 1.20GHz
stepping : 2
cpu MHz : 800.000
cache size : 2048 KB
physical id : 0
siblings : 2
core id : 0
cpu cores : 2
fdiv_bug : no
hlt_bug : no
f00f_bug : no
coma_bug : no
fpu : yes
fpu_exception : yes
cpuid level : 10
wp : yes
flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse
bogomips : 2397.11
clflush size : 64

processor : 1
vendor_id : GenuineIntel
cpu family : 6
model : 15
model name : Intel(R) Core(TM)2 CPU          U7600 @ 1.20GHz
stepping : 2
cpu MHz : 800.000
cache size : 2048 KB
physical id : 0
siblings : 2
core id : 1
cpu cores : 2
fdiv_bug : no
hlt_bug : no
f00f_bug : no
coma_bug : no
fpu : yes
```

```
fpu_exception : yes
cpuid level : 10
wp : yes
flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2
bogomips : 2394.09
clflush size : 64
```

And finally the boot messages (en ligne sur <https://www.bortzmeyer.org/files/dell-latitude-d430-boot> seen by dmesg.

The network interface card has been tested on 100 Mb/s switches only. It should be capable of 1 Gb/s, but I did not find such a switch yet.

The external CD reader works fine. I did not test with DVD yet. The CD writers works fine with wodim / cdrecord from cdrkit. Here is a typical command-line :

```
wodim -eject speed=2 backup.iso
```

But the `-multi` option fails to produce usable CDs for me. To build the ISO image, I used `genisoimage`, again from cdrkit. Here is a typical invocation :

```
genisoimage -J -r -T -m '*~' -m '#*' -m tmp -o backup.iso -V BackupEtc /etc
```

The wireless interface was a real pain. The driver was completed only recently (see <http://intellinuxwireless.org/?p=iwlwifi&n=howto-iwlwifi>). After the upgrade to Ubuntu Hardy 8.04 (and kernel 2.6.24), it worked. (Before that, I had to install the driver by hand and it froze the machine.) The Kill Switch on the right side of the PC works fine. Using it saves power and makes the system more reliable.

The sound card, an Intel 82801/ICH7 works with the `snd_hda_intel` ALSA driver. Everything goes through ALSA (I did not install a sound daemon.) `xmms` or `mplayer` are happy.

The internal Ricoh SD card reader works if you load the right kernel module, `sdhci`, with `modprobe` :

```
# mount -t auto /dev/mmcbk0p1 /mnt
% ls -alt /mnt
total 52
drwxr-xr-x 21 root root 4096 Aug  6 23:40 ..
drwxr-xr-x  3 root root 16384 Apr 23 21:45 dcim
drwxr-xr-x  2 root root 16384 Apr 23 21:45 misc
drwxr-xr-x  4 root root 16384 Jan  1 1970 .
```

Power management is controlled by ACPI. The reporting of the battery state is correct and I can have a good idea of the time left in the battery.

However, power management with `powersave` is too unreliable to count on it. Suspend to RAM does not work at all and suspend to disk works... sometimes (the other times, the machine hangs or crashes). It seems related with Wifi : when the Wifi system is shut down completely (by the Kill Switch on the right side of the machine), suspend to disk is much more stable. CPU frequency stepping does not seem to work. Powersaved reports :

```
FATAL: Error inserting speedstep_centrino
(/lib/modules/2.6.22.1/kernel/arch/i386/kernel/cpu/cpufreq/speedstep-centrino.ko):
No such device
```

X11 works fine at 1024x768. Installing the Ubuntu package "915resolution", to tweak the Intel chipset, allows to go to 1280x800 (unlike what "Ubuntu 7.04 Festy Fawn on Dell Latitude D420" <<http://lamouroux.net/blog/?p=23>> says, I did not have to edit /etc/default/915resolution). Here are the X.org messages (en ligne sur <https://www.bortzmeyer.org/files/dell-latitude-d430-x11>).

As seen in /proc/cpuinfo (the vmx flag), this machine has hardware virtualisation support. It needs to be enabled in the BIOS (it is off by default). After, you must load modules `kvm` and `kvm-intel`.