
HP NC6000 with Fedora Core 2

Installation Notes

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Abstract

Some notes from a successful attempt to install and configure Fedora Core 2 on a HP NC6000 Latest version of this document is available for download as [PDF](#) or [HTML](#).

1. Intro

These are some notes from an installation and configuration of Fedora Core 2 - formerly known as Red-Hat Linux - on a Hewlett-Packard NC6000 laptop. The HP NC6000 is a lightweight (-ish) business laptop with WLAN and Bluetooth support.

Warning!

IANALG - I Am Not A Linux Guru. I'm an operating system and a Java programmer. Don't take my word on this. All [feedback](#) is welcome.

1.1. Hardware

Apart from the usual array of ports and 512MB of 333MHz DDR RAM, the HP NC6000 contains the following hardware subsystems.

Table 1. Hardware Subsystems

type	description
processor	Intel Pentium M 1.6GHz (1MB L2 Cache)
hd	40GB 5.4K rpm
cd / dvd	DVD/CDRW
screen	14.1" XGA (1024x768)
graphics	ATI Mobility Radeon 9600 32MB
battery	Li-Ion 6-cell
modem	Agere Lucent Winmodem AMR V92
nic	Broadcom NetXtreme BCM5705M
wireless nic	Atheros AR5212 802.11abg
sound	Intel 82801DB (ICH4) AC 97
touchpad	Synaptics PS/2

1.1.1. lspci output

Here's the output of `lspci`, line broken for layout:

```
00:00.0 Host bridge: Intel Corp. 82855PM Processor to I/O \
          Controller (rev 03)
00:01.0 PCI bridge: Intel Corp. 82855PM Processor to \
          AGP Controller (rev 03)
00:1d.0 USB Controller: Intel Corp. 82801DB (ICH4) \
          USB UHCI #1 (rev 03)
00:1d.1 USB Controller: Intel Corp. 82801DB (ICH4) \
          USB UHCI #2 (rev 03)
00:1d.2 USB Controller: Intel Corp. 82801DB (ICH4) \
          USB UHCI #3 (rev 03)
00:1d.7 USB Controller: Intel Corp. 82801DB (ICH4) \
          USB2 EHCI Controller (rev 03)
00:1e.0 PCI bridge: Intel Corp. 82801BAM/CAM \
          PCI Bridge (rev 83)
00:1f.0 ISA bridge: Intel Corp. 82801DBM \
          LPC Interface Controller (rev 03)
00:1f.1 IDE interface: Intel Corp. 82801DBM (ICH4) \
          Ultra ATA Storage Controller (rev 03)
00:1f.5 Multimedia audio controller: Intel Corp. 82801DB (ICH4) \
          AC'97 Audio Controller (rev 03)
00:1f.6 Modem: Intel Corp. 82801DB (ICH4) \
          AC'97 Modem Controller (rev 03)
01:00.0 VGA compatible controller: \
          ATI Technologies Inc RV350 [Mobility Radeon 9600 M10]
02:04.0 Ethernet controller: \
          Atheros Communications, Inc. AR5212 802.11abg NIC (rev 01)
02:06.0 CardBus bridge: O2 Micro, Inc. OZ711M3 \
          SmartCardBus MultiMediaBay Controller
02:06.1 CardBus bridge: O2 Micro, Inc. OZ711M3 \
          SmartCardBus MultiMediaBay Controller
02:06.2 System peripheral: O2 Micro, Inc. OZ711Mx \
          MultiMediaBay Accelerator
```

```
02:06.3 CardBus bridge: O2 Micro, Inc. OZ711M3 \
SmartCardBus MultiMediaBay Controller
02:0e.0 Ethernet controller: Broadcom Corporation NetXtreme \
BCM5705M_2 Gigabit Ethernet (rev 03)
```

2. Overview

Table 2. Functional Overview

component	status	comment
X / Graphics	ok	ATI binary driver
LAN NIC	ok	n/a
WLAN NIC	ok	ndiswrapper / Atheros Win driver
CPU / SpeedStep	ok	cpufreqd
Touchpad	ok	Synaptics Linux Driver
UDMA	ok	n/a
Keycodes	ok	xmodmap
USB	ok	n/a
PCMCIA	ok	n/a
Modem	dunno	not tested
IrDA	dunno	not tested
Bluetooth	dunno	not tested

3. Installation

I started by booting up Windo\$e as I'm forced to use it once in a while. Also I updated all Windo\$e drivers along with XP security updates and what-not order to check that at least those worked.

Bitrate Tip

It took me an hour to understand how the WLAN was to be setup. Apparently, the Atheros drivers in Windo\$e does not support the hybrid speed 22Mbps and did not want to connect to the router - even though the router, an SMC Barricade Turbo (smc2404wbr) claimed that 11Mbps would be fine. By explicitly setting the router down to 11Mbps the Atheors MiniPCI finally connected.

Next step: Resizing the main HD partition down to 8GB in order to make room for the Linux partitions. I used Partition Magic 8 for the task.

Then I rebooted and tried a Fedora Anaconda CD install. X failed to start. Went through text install without any problems. To my utter amazement, X started immediately.

I made a permanent switch to use KDE as the default desktop instead of Gnome by editing the /etc/sysconfig/desktop file.

4. Details

4.1. Graphics

The WESA drivers were installed initially. And as suspected, getting the ATI OpenGL acceleration to work is non-trivial as Fedora have moved to X.org instead of XFree86. Here's what I did:

1. Download ATI binary drivers v. 3.11. The main Linux driver support the Mobility chipset. I found them [here](#). Check the release note for later version that the Mobility chipset is still supported.
2. Install ATI drivers according to their installation instructions.

```
rmp -Uvh --force fglrx-4.3.0-<version>.i386.rpm
```
3. Copied the "device" section from the generated XF86Config-4 file to the xorg.conf file and changed the display to use them.
4. Read [this](#) to find these patches: [patch1](#) and [patch1](#).
5. Followed above instructions. Restarted X by logging out and then killing X using the good old `ctrl+al+backspace`.

Bingo. OpenGL acceleration supported.

I have posted my xorg.conf file [here](#).

Missing Patch

Apparently patch one above is missing from the web. Fortunately, there seems to be other alternatives available. Reports have shown that [this](#) may work but I have not tested it myself. (Thanks to [hicham](#) for testing).

4.2. Network

The Broadcom NIC was correctly identified and setup by the installation.

4.3. Touchpad

Normal X driver works. But in order to use touchpad scrolling and taps and so on I installed the Synaptics Linux driver found [here](#).

4.4. USB

Works out of the box.

4.5. Wireless

I went with the SourceForge [ndiswrapper](#) project using an Atheros NDIS Windows Driver, found [here](#). Thanks to [Patric Reynolds](#) for those links.

The ndiswrapper installed ok. I then edited the sysconfig `ifcfg-wlan0` config file to include my WEP key, channel number, gateway IP and so on. After which `ifup wlan0` worked like a charm.

4.6. PCMCIA / Cardbus

Works out of the box.

4.7. IDE / UDMA

UDMA was active after installation. `hdparm -Tt /dev/hda` reported 712MB/s in buffer cache reads and 31MB/s in buffer disk reads which AFAIK is more or less correct.

4.8. CPU

CPU frequency scaling works out of the box. I attempted to run `cpudyn` to dynamically change the load. However, it failed to start, when debugging claiming that it could not write to the scaling governor. Investigating...

However, `cpufreq` had no such problems so I went with that. You need to change the config file from percentages to absolute clock speeds though. Do a `cat` on the CPU governor to get the max and min speeds of the processor.

```
cat /sys/devices/system/cpu/cpu0/cpufreq/cpuinfo_min_freq
cat /sys/devices/system/cpu/cpu0/cpufreq/cpuinfo_max_freq
```

Given that, here's the relevant parts from my `cpufreqd` configuration file:

```
[Profile]
name=hi_boost
minfreq=1200000
maxfreq=1600000
policy=performance

[Profile]
name=medium_boost
minfreq=1000000
maxfreq=1600000
policy=performance

[Profile]
name=lo_boost
minfreq=600000
maxfreq=1000000
policy=performance

[Profile]
name=lo_power
minfreq=600000
maxfreq=8000000
policy=powersave
```

4.9. Function Keys

Keycodes can be found out using the `xev` command.

Table 3. Volume Keys

key	generated keycode
toggle mute	160
volume down	174

key	generated keycode
volume up	176

And can be mapped to functional keys using `xmodmap`:

```
xmodmap -e "keycode 160 = F15"
xmodmap -e "keycode 174 = F16"
xmodmap -e "keycode 176 = F17"
```

Having done that you can map F15-F17 to your favourite mixer. Since I'm using KDE I used `kmix`. (Open `kmix`, right click above the "main" slider and choose "define keys").

The we're left with the "lock" and "presentation" buttons which generates extended keycode values. The "wireless" button can't be used, and you wouldn't want to since you need it to toggle the WLAN.

Table 4. Function Keys

key	extended keycode
lock desktop	e00a
presentation	e008

I'm not interested in "presentation" so I mapped "e00a" to keycode 90 like this:

```
setkeycodes e00a 90
```

Used `xmodmap` again:

```
xmodmap -e "keycode 127 = F19"
```

And finally you can map F19 to a screen locking script. I used the KDE "hot keys" to map F19 to `/usr/bin/kdesktop_lock --forcelock`. (The hot key bindings can be found in Control Center / Region & Accessibility).

I made the changes permanent by adding them to the `/etc/profile` configuration file. I'm sure there's a better place for them but none that I could think on.

4.10. ACPI

Powerbutton works. Battery is recognized. Suspend fails miserably. Will try software suspend next.

4.11. SD / MMC Card Reader

Not tested yet.

4.12. DVD / CDRW

DVD works... Almost. `xine` gives me a blank screen, `Ogle` and `MPlayer` plays DVDs but refuse to deal with menus. I'm using `libdvdcss` 1.2.8 and all should be fine. But. As I'm in Sweden I belong to cage... sorry, "region" 2. And this sort of problems apparently have with region coding to do. So I checked with a region 0 DVD and lo! It worked. Just in case then I used `regionset` to make saure the DVD reported itself in region 2, but: no, still nothing.

Investigating...

CDRW works out of the box.

4.13. Modem

Not tested yet.

4.14. IrDA

Not tested yet.

4.15. Bluetooth

Not tested yet.

4.16. Sound

Supported out of the box using the `snd-intel8x0` module. Identified during installation.

5. Feedback And Credits

As [IANALG](#) all feedback is welcome at [feedback \(4t\) larsan d0t net](#).

This document was written in in [DocBook](#) and transformed using [Ant](#) and [Apache FOP](#).

This document is listed on <http://tuxmobil.org/>. A brilliant resource for all Linux vs. Laptop adventures.

6. Change Log

Document incarnations follows below.

- 2004 / 09 / 16 .Lars J. Nilsson. [feedback \(4t\) larsan d0t net](#). Posted xorg.conf file and added info on missing API patch.
- 2004 / 08 / 23 .Lars J. Nilsson. [feedback \(4t\) larsan d0t net](#). DVD/CDRW added.
- 2004 / 08 / 19. Lars J. Nilsson. [feedback \(4t\) larsan d0t net](#). cpufreqd and PCMCIA added..
- 2004 / 08 / 18. Lars J. Nilsson. [feedback \(4t\) larsan d0t net](#). Document created.