

Linux Installation and Configuration on HP Commercial Mobile Products



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Introduction

This will aid the end user in configuring and installing Novell Linux Desktop 9 on the following HP Compaq products: nc4200, tc4200, nc6110, nc6120, nx6110, nx6120, nc6220, nc6230, nc8230, and nx8220. Red Hat RHEL 4 WS installation and configuration is also covered for the nw8240. The Hp commercial mobiles group does not sell or re-distribute Red Hat or Novell Linux software.

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System ROMs via SoftPaqs

HP PSG Mobile will offer its Linux specific software downloads, *called SoftPaqs*, on the FTP site, links provided in the table below. This Section will serve as a guide for downloading HP PSG Mobile SoftPaqs. Click on the SoftPaq(s) listed below to download.

The following SoftPaqs enable the user to create a bootable diskette or CD that can be used to upgrade the System BIOS for the listed notebook models.

How to use:

- Download the SoftPaq.tar (spxxxx.tar) file to a directory on the hard drive.
- Open a shell and run the following command to extract the package: **tar xf spxxxx.tar**
- Use the following command to execute the package: **sh spxxxx.sh**
- Follow the on-screen instructions to create either a bootable diskette or a bootable CD.
- After creating a bootable diskette or CD, the SoftPaq.tar file downloaded can be deleted, if desired.
- Power Off the notebook.
- Place the newly created bootable diskette in Drive A, or place the bootable CD in the CD-ROM drive and restart the notebook to update the system BIOS.

IMPORTANT: DO NOT TURN OFF POWER TO THE COMPUTER WHILE UPDATING THE SYSTEM BIOS.

SoftPaq Deliverable Matrix

| Product (HP Compaq) | SoftPaq | Readme |
|---------------------|--|--------------------------------------|
| nc 4200 tc 4200 | Softpaq file (SP30431.tar) | Readme (SP30431.txt) |
| nc 6110 | Softpaq file (SP30430.tar) | Readme (SP30430.txt) |

| | | |
|-------------------------------|--|--------------------------------------|
| nc 6120 | | |
| nx 6110 nx 6120 | Softpaq file (SP30430.tar) | Readme (SP30430.txt) |
| nc 6220 | Softpaq file (SP30429.tar) | Readme (SP30429.txt) |
| nc 6230 | Softpaq file (SP30428.tar) | Readme (SP30428.txt) |
| nc 8230 nw 8240 nx 8220 | Softpaq file (SP30500.tar) | Readme (SP30500.txt) |

Novell Linux Desktop 9 Installation and Setup

This section applies to the following HP Compaq products: nc4200, tc4200, nc6110, nc6120, nx6110, nx6120, nc6220, nc6230, nc8230, and nx8220.

The tablet PC, HP Compaq tc 4200, is a tablet form factor only. For a default Linux OS installation, no tablet features exist; the HP Compaq tc 4200 functions only as a laptop.

Operating System Installation

- Use the OS setup option `ACPI=Disabled` at the initial OS setup screen. Failure to do so may cause system damage. Enable ACPI after the OS setup is complete by modifying the `/boot/grub/menu.lst`. Change the value of `ACPI=off` to `ACPI=on`.
- The following packages must be installed in addition to the default packages via YaST "Install Remove Software"; either at initial OS setup or after the OS is installed. During OS setup for example, at the YaST software setup screen where disk partitioning and date/time zone are configured there is a software link:
- When selected a user should see the YaST `>>SOFTWARE>>INSTALL REMOVE SOFTWARE SCREEN`. Change the filter option to Package Groups and highlight the Development limb of the tree and install the packages highlighted below.

Development

```

|--Languages
    |--C and C++
        |--gcc
        |--gcc-c++
        |--gcc-info
        |--gcc-locale
    |--Other
        |--gcc-objc
|--Libraries
    |--C and C++
        |--glib2
        |--glib2-devel
        |--glib2-doc
        |--glibc-devel
        |--glibc-profile
        |--glib-devel
|--Sources
    |--kernel-source
    |--kernel-syms
    |--qt3-examples

```

```

|--Tools
    |--Building
        |--autoconf
        |--automake
        |--expect
        |--libtool
        |--make

```

Accept all automatic changes

Integrated Gigabit Ethernet Network Interface Controllers

The products either ship with the Broadcom NetXtreme Gigabit BCM5705 or BCM5751 Network Controller . Refer to the table below. If the driver is included in the OS setup then installation of the Bcm5700 driver is optional.

Novell Linux Desktop 9 Support Pack 1 uses the updated tg3 driver which supports the Broadcom BCM5751 Network Controller; however the instructions for installing the bcm5700 driver are listed below for users who wish to use the bcm5700 driver.

| Product (HP Compaq) | Device | Driver | Included in default NLD9 installation |
|---------------------|---------|---------|---------------------------------------|
| nc4200 | BCM5751 | Bcm5700 | No |
| tc4200 | BCM5751 | Bcm5700 | No |
| nc6110 | BCM5705 | Tg3 | Yes |
| nc6120 | BCM5705 | Tg3 | Yes |
| nx6110 | BCM5705 | Tg3 | Yes |
| nx6120 | BCM5705 | Tg3 | Yes |
| nc6220 | BCM5751 | Bcm5700 | No |
| nc6230 | BCM5751 | Bcm5700 | No |
| nc8230 | BCM5751 | Bcm5700 | No |
| nx8220 | BCM5751 | Bcm5700 | No |

Broadcom driver installation and configuration:

- Download the driver from Broadcom. <http://www.broadcom.com/drivers/>
- Install the source RPM package: In this case create a bcm5700 directory e.g., /home/bcm5700. Run the following commands listed below in **bold**.
- **cd /home/bcm5700**
- **rpm -ivh bcm5700-<version>.src.rpm**
- Change Directory to the RPM path and build the binary driver.
- **cd /usr/src/packages**
- **rpmbuild -bb SPECS/bcm5700.spec**
- Note that the RPM path is different for different Linux distributions, in this case kernel 2.6.xx is used.
- Install the newly built package (driver and man page).
- **rpm -ivh RPMS/i386/bcm5700-<version>.i386.rpm**
- The .rpm file may be in the i586 directory so the command may be **rpm -ivh RPMS/i586/bcm5700-<version>.i386.rpm**
- The force option may have to be used: **rpm -ivh --force RPMS/i586/bcm5700-<version>.i386.rpm**

- Go to the `usr/src/packages/BUILD/bcm5700-7.3.5` directory
- **`cd /usr/src/packages/BUILD/bcm5700-7.3.5`**
- Install the module; with the command: **`modprobe bcm5700`**
- Run YaST to configure the NIC. The module used for the device is the `bcm5700`.

Wireless WLAN – 802.11 a/b/g and 802.11 b/g

This section applies to the Intel PRO/Wireless 2200BG and Intel PRO/Wireless 2915A Network Connections. All Intel Wireless devices in the 2005 Mobile product line use either controller. In this case the IPW2200 Linux driver supports both the 2200BG and 2915A Intel PRO/Wireless Network Connection.

- Run YaST > Hardware > Hardware Information and probe the hardware. Note: An example of a HW address for the device is `00:0e:35:68:48:ce`
- The HW address may not be found until after driver installation.
- Make a note of the PCI bus ID. For example, `0000:02:04:0`, this will be needed for network configuration later.
- Root login required.
- Download the driver and firmware package from Intel.com: `ipw2200_linux_1_0_0.tgz`
<http://support.intel.com/support/wireless/wlan/index.htm>
- Copy `ipw2200_linux_1_0_0.tgz` to a directory; for example, `/home/intel2200`.
- In a shell run the commands listed below in bold.
- **`tar xzvf ipw2200_linux_1_0_0.tgz`** (will create `intel_ipw2200` directory which contains the firmware package, `ipw2200-fw-2.2.tgz` and the driver package, `ipw2200-1.0.0.tgz`.)
- **`cd intel_ipw2200`**
- **`tar xzvf ipw2200-1.0.0.tgz`** (tar should create and populate an `ipw2200-1.0.0` directory)
- **`cd ipw2200-1.0.0`**
- **`make install`**
- Unpack the firmware with the following commands.
- **`cd /home/intel2200/intel_ipw2200`**
- **`mkdir ipw2200-fw`**
- **`cp ipw2200-fw-2.2.tgz ./ipw2200-fw`**
- **`cd ipw2200-fw`**
- **`tar xzvf ipw2200-fw-2.2.tgz`**
- Copy all contents of `/home/intel2200/ipw2200-fw/` to `/usr/lib/hotplug/firmware`. Except do not copy the `ipw2200-fw-2.2.tgz`.
- Then initialize the module with the command **`/etc/init.d/hotplug restart`**
- Install the module with the following command: **`modprobe ipw2200`**
- If the hardware address is unknown rerun YaST> Hardware > Hardware Information. Note: May not have HW address until after `modprobe ipw2200`.
- Configure the wireless network device in YaST.
 - YaST
 - NETWORK Devices
 - Network Card
 - Change
 - ADD Device Type Wireless
 - In the Configuration Name box add the hardware address for the device; for example, ignore the quotes, `"id-00:0e:35:68:48:ce"`
 - In the Hardware Configuration Name box add the `sysfs_bus_id` for the device; for example, ignore the quotes, `"bus-pci-0000:02:04:0"`
 - In the Module Name box add the following, ignore the quotes, `"ipw2200"`

- Select Wireless settings: these may vary.

Graphics

All products in the 2005 Mobile Line ship with either the Intel Graphics Media Accelerator 900 or the ATI graphics solution.

Intel Graphics

This section applies to the HP Compaq nc4200, tc4200, nc6110, nc6120, nx6110, nx6120, and nc6220. All of the aforementioned products use the Intel Graphics Media Accelerator 900 solution.

- Download the driver from Intel.com: <http://support.intel.com/support/graphics/intel915gm/>
- Copy files to the initial location. e.g. /home/i915
- Reboot and select failsafe mode at the grub boot menu
- Login as root
- Change directory to the location of the rpm file and install the package with the following command, **rpm -i dri-i915-<version>.i386.rpm**
- The console prompt will reappear in a few moments
- With 2.6 kernels it may be necessary to reboot for the changes to take effect.
- After rebooting login regularly.
- Configure the graphics adapter.
- Run SuSE's own configuration utility, 'YaST'
 - Select the 'Hardware' icon
 - Select the 'Graphics Card and Monitor' icon
 - Select 'Graphics desktop environment' radio button
 - Select 'Change'
 - Under 'Desktop' select 'Graphics Card'
 - Select 'Add new card'
 - Under 'General' tab, select 'Intel' and then '915G'
 - Accept all changes and exit 'YaST'
 - Log out of root or superuser. Users should be able to restart the graphics subsystem without reboot, just end the session and re-login.

ATI Graphics

This section applies to the HP Compaq nc6230, nc8230, and nx8220. Use the fglrx driver version 8.14.13. The nc6230 uses the ATI Mobility Radeon X300 solution. The nc8230 and nx8220 use the ATI Mobility Radeon X600 solution.

- Download the driver from ATI.com.
<https://support.ati.com/ics/support/default.asp?deptID=894&task=knowledge&folderID=27>
- Copy files to the initial location. e.g. /home/ATI
- Determine which version of X Windows is running. For example, NLD9 is XFree86 4.3.
- Install the driver with the following commands: **rpm -ivh --force fglrx_4_3xxxx.rpm**
- Install the module: **modprobe fglrx**
- Run the command **fglrxconfig** to create the XF86Config-4 file.
 - For the FireGL Screen Layout question, be sure to choose option 2 Laptop mode from the configuration list
 - For hsync values choose option "7" "31.5 - 91.1"
 - For vertical sync range values choose option "5" "60 - 100"
 - For Display modes choose all configurations except option "9" "1792x1394".

- Additionally, when choosing display modes put the highest resolution first. For example, choose 81234 to yield "1600x1200" "640x480" "800x600" "1024x768" "1152x764" etc.

Note: Minor issue. If the highest resolution is not listed first in the XF86Config-4, the login screen will exceed the display area. However, users can still login regardless of the order of resolutions listed.

- Modify the XF86Config-4.
- In the section[*Section "Device"*], Change the following
- {Initially reads} Option MonitorLayout "AUTO, NONE"
- {Should read} Option MonitorLayout "AUTO, AUTO"
- **Failure to do so will result in a blank screen.**

AUDIO

Use "alsaconf" to configure the audio device.

Red Hat RHEL 4 WS Installation and Setup

This section applies to the HP Compaq nw8240. With respect to OS installation and setup the notable hardware specifics are listed below.

- Integrated Broadcom NetXtreme Gigabit Ethernet adapter (BCM5751).
- Intel 2200BG or 2915ABG wireless network connection.
- ATI Mobility Fire GL V5000 graphics controller.

Integrated Gigabit Ethernet Network Interface Controllers

Red Hat RHEL 4 ships with the updated tg3 driver which supports the Broadcom NetXtreme Gigabit Ethernet BCM5751 controller. No driver installation is required.

Wireless WLAN – 802.11 a/b/g and 802.11 b/g

This section applies to the Intel PRO/Wireless 2200BG and Intel PRO/Wireless 2915A Network Connections. All Intel Wireless devices in the 2005 Mobile product line use either controller. In this case the IPW2200 Linux driver supports both the 2200BG and 2915A Intel PRO/Wireless Network Connection.

- Red Hat Enterprise Linux 4 Workstation ships with the IPW2200 module installed. In order to get the Intel PRO/Wireless device functional on the nw8240, additional RPMs must be installed from the Red Hat Enterprise Linux WS (v. 4 for x86) Extras CD. The RPM listed below contains the firmware for the Intel PRO/Wireless hardware:
- *ipw2200-firmware-2.0-3.noarch.rpm*

- The file is located in the `Red Hat/RPMS/` directory on the CD and can be installed with the command: **`rpm -ivh ipw2200-firmware-2.0-3.noarch.rpm`**
- Alternatively, one can use [Red Hat Network](https://rhn.redhat.com/) (RHN) to install networking (via a fixed network connection). The files are located in the Extras Channel, so add the Extras Channel to the RHN profile via <https://rhn.redhat.com/>.
- Use the Network Device Control Application to Configure and Activate the Wireless device.

Graphics

The HP Compaq nw8240 uses the ATI Mobility Fire GL V5000 graphics controller.

- Download the driver from ATI.com:
<https://support.ati.com/ics/support/default.asp?deptID=894&task=knowledge&folderID=27>
- It is recommended that the 8.14.13 version of the driver is used. Version 8.12.10 has support for nw8240 hardware but can potentially yield undesirable screen effects.
- Copy files to the initial location. e.g. `/home/ATI`
- Determine which version of X Windows is running. For example, Red Hat RHEL 4 is X Org 6.8.
- Install the driver with the following commands: **`rpm -ivh --force fglr_x_6_8xxxx.rpm`**
- Install the module: **`modprobe fglr_x`**
- Run the command **`fglr_xconfig`** to create the `xorg.conf` file.
 - For the FireGL Screen Layout question, be sure to choose option 2 Laptop mode from the configuration list
 - For hsync values choose option "7" "31.5 - 91.1"
 - For vertical sync range values choose option "5" "60 - 100"
 - For Display modes choose all configurations except option "9" "1792x1394".
 - Additionally, when choosing display modes put the highest resolution first. For example, choose 81234 to yield "1600x1200" "640x480" "800x600" "1024x768" "1152x764" etc.

Note: Minor issue. If the highest resolution is not listed first in the `xorg.conf`, the login screen will exceed the display area. However, users can still login regardless of the order of resolutions listed.

- Modify the `xorg.conf`.
- In the section[*Section "Device"*], Change the following
- **{BEFORE} Option MonitorLayout "AUTO, NONE"**
- **{AFTER} Option MonitorLayout "AUTO, AUTO"**
- **Failure to do so will result in a blank screen.**
- Optional: Manually add the "1920x1200" screen resolution; be sure to make it the first entry on the list.

Observations with the ATI Graphics driver loaded:

Screen Saver: If a user configures the screen saver, disable the "Lock Screen" feature. The system may lock up when trying to unlock the locked screen.

Blank Screen after the lid has been closed and re-opened: The workaround is as follows: After opening the lid press **ctrl-alt-f1** to switch to another terminal then press **ctrl-alt-f7** to change back to the default terminal.

NDISWrapper for Broadcom Wireless 802.11 a/b/g WLAN

Listed below is a procedure for installing NDISWRAPPER and the Windows driver for the Broadcom Wireless solution. In this case the machine used was the nx6120 running Novell Linux Desktop 9.

- Install NDISWRAPPER v. 08.12 from the SDK CD or from the Red Carpet SDK channel
- Install KM_NDISWRAPPER source from SDK CD or from the Red Carpet SDK channel
- Obtain Windows XP drivers for the device. The nx6120 802.11 g Broadcom wireless solution is the B94306 In the case of the nx6120 the Windows driver is located in Softpaq SP29361 via <ftp://ftp.compaq.com>
- Expand SP29361.exe. Run SP29361.exe on a Windows machine to expand it.
- Copy drivers, all expanded contents from SP29361.exe to a directory on the target machine, in this case the nx6120.
- Now bind windows drivers to ndiswrapper with the following command: **ndiswrapper -i bcmwl5a.inf**
- Run the following command **ndiswrapper -m** (to make ndiswrapper ready for modprobe)
- Add "modprobe ndiswrapper" to the /etc/modules.conf file, ignore the quotes, then run the command **modprobe ndiswrapper**.
- Configure the wireless device in YaST
 - YaST>>Network>>configure>>wireless>> the module is "ndiswrapper" Do not use the id-HWADDRESS and bus-pci-BUS ADDRESS as is done when adding the Linux driver, use the default values.
 - YaST
 - NETWORK Devices
 - Network Card
 - Change
 - ADD Device Type Wireless
 - Do not use the id-HWADDRESS and bus-pci-BUS ADDRESS as is done when adding the Linux driver, use the default values.
 - In the Module Name box add the following, ignore the quotes, "ipw2200"
 - Select Wireless settings: these may vary.

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