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README: Installation of Ralink RT61 and RT73 Drivers

**Note that Driver builds are NOT required for UBUNTU Intrepid Ibex 8.10, Hardy Heron 8.04 or Fedora Core 9!!
For notes about these Linux distributions see the README_FIRST.pdf file on the CD.**

CD Contents

The Linux Emporium Ralink CD contains:

- this README
- A tarfile, `le_ralink_install.tar` containing drivers and install scripts for the cards which we supply.
- A directory containing a driver and install script for the usb sticks with Ubuntu Gutsy
- A directory containing drivers and installation scripts for all devices with Fedora 8
- A directory, `serialmonkey`, containing the serialmonkey project drivers, which may be helpful to some people.
- A problem solving guide.

General Info

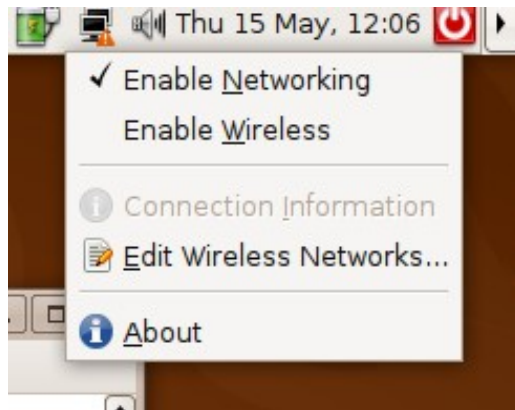
The current Ralink wireless chipsets are the RT2561 (for PCI and PCMCIA cards) and the RT2571 (for USB dongles). Thanks to the work of the serialmonkey project there is good driver support for these chipsets, and the drivers are incorporated in kernels 2.6.22 and above. With 2.6.22 configuration of the network interface using Network Manager can be problematic, while it is straight-forward with 2.6.24 kernels.

All the Edimax devices we sell will work out of the box with Ubuntu 8.10 Intrepid Ibex, Ubuntu 8.04 Hardy Heron and Fedora Core 9 and support WEP and WPA/WPA2 Personal encryption. The cards also work with SUSE 11.0, but may require firmware installation.

This README contains instructions for using Network Manager with the latest distributions followed by instructions on building drivers and configuring the interface with older distributions.

Configuring Using Network Manager

Right-click on the Network Manager icon – it looks like a pair of computer screens on the upper panel. If the device is plugged in and has been detected there should be an Enable Wireless option. Click on this so that it becomes ticked.



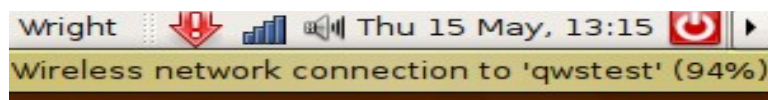
Then left-click on the icon and select the small button beside the network that you wish to connect to:



You should be prompted for a passphrase or key:



Enter a passphrase or key. The icon will change and if a connection is established the icon will change to a bar graph indicating the signal strength. If the mouse pointer is hovered on the icon a legend will be displayed:



Upgrading to Hardy Heron when using a USB Stick

The Edimax USB adapter works out of the box with Hardy Heron using its built-in rt73usb driver.

If you are upgrading and have previously built our rt73 driver then you should blacklist it by adding an appropriate line to `/etc/modprobe.d/blacklist`. You should also check that `rt73usb` is not present in the blacklist!

Driver Builds For Older Distributions

The scripts we provide have been tested on Debian Etch with kernel 2.6.18, Ubuntu Gutsy 7.10, Fiesty 7.04, 6.10 and 6.06, openSUSE 10.2 and Fedora 8, Fedora 7 and Fedora Core 6, and using the cards which we supply, with the following results:

- RT73 (USB): reliable operation on all distributions tested. A more recent version of the serialmonkey drivers is used with Ubuntu 7.10.

- RT61 (PCI/PCMCIA): reliable operation on all distributions . Note that the RT61 will work “out of the box” with Ubuntu Fiesty, see the notes on page 5, and with Ubuntu 7.10.

We have tested on Intel x86 Linux systems only. We have not attempted to set up the openSUSE ifup/down scripts, using a shell script instead, hopefully some of our customers more expert than us with this distribution will help!

We supply a separate build for Fedora 8, however configuration with Network Manager has been problematic. We supply an example script to set up the interface, but the best advice is to upgrade to Fedora 9 if you can.

We have been unable to get a consistent build with OpenSUSE 10.3.

Ubuntu Gutsy 7.10

PCI and PCMCIA cards

The Edimax PCI and PCMCIA cards work “out of the box” with Ubuntu Gutsy 7.10 after updates have been applied. Configuration for WEP and WPA/TPIK encryption can be carried out using Network Manager. Note that you should ensure that your installation is fully up-to-date so as to avoid an earlier problem with ipv6 addresses.

USB Devices

As of 1st November 2007, without a driver, the USB devices initially appear to work with Gutsy, but then hang. We provide a driver build script with a recent version of the serialmonkey updated legacy drivers.

Note that you may well need to be connected to the internet to carry out a driver build, unless you already have installed the build tools and linux headers.

Instructions for installation are as follows:

1. Ensure that your Gutsy installation is up to date. Typically this can be done using the notification icon on the panel, or from a console.

Open a console by selecting Applications/Accessories/Terminal

```
$ sudo aptitude update
```

followed by

```
$ sudo aptitude upgrade
```

If the kernel has been updated it is advisable to restart your machine.

2. Become the root user:

```
$ sudo -s
```

3. Copy the contents of the gutsyusb directory from the CDROM to the /usr/src directory on your machine:

```
# cp -r /media/cdrom/gutsyusb/ /usr/src
```

4. Change directory and run the script:

```
# cd /usr/src/gutsyusb  
# ./ginstall.sh
```

You may be prompted to insert your Ubuntu installation CD – remove the driver CD and put the installation CD in your drive. Close the file browser box that pops up and then press enter in the console window.

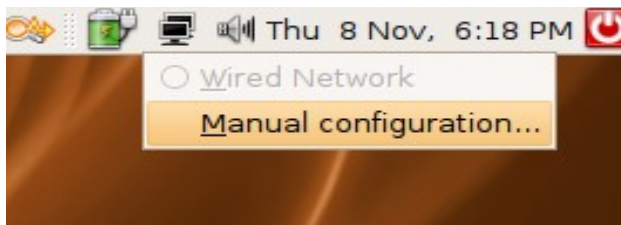
Watch the installation for error messages like “unable to fetch archive”. If this occurs an attempt has failed to access a repository and the script will need to be re-run.

Remember to remove the installation CD when the installation has finished.

When the build has completed it is advisable to restart your machine without the stick in order to ensure that the correct kernel modules are loaded. Also disconnect any wired connections.

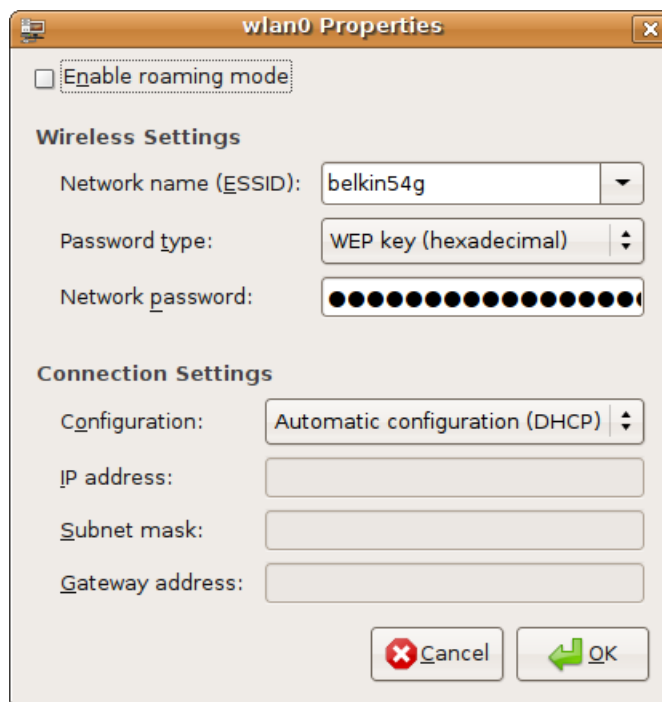
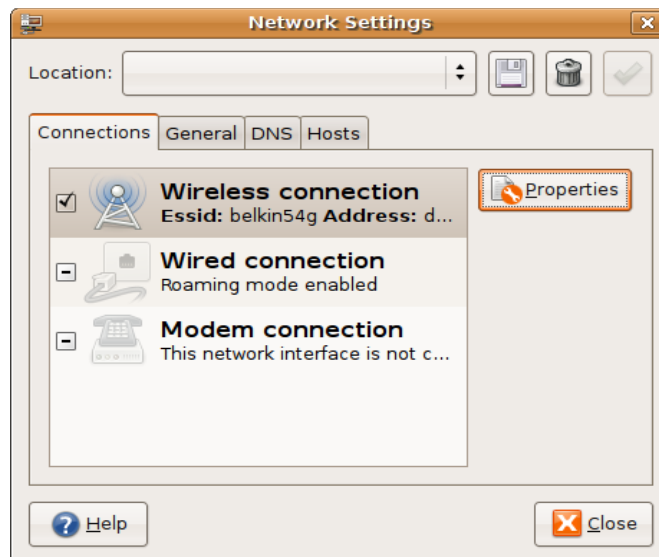
The stick can be configured for WEP using the Manual option in Network Manager. Make sure that you know the ESSID and encryption key for your network. It's a good idea to type the key into a text file first and then subsequently paste it into the box when prompted by Network Manager.

Plug in the wireless stick and left Click on the Network Manager icon on the panel and select the Manual configuration option.



You will be prompted for your password and will then be presented with a configuration screen. Highlight the wireless connection and click on Properties. In the properties screen that is shown disable roaming by unticking the box and a Network Settings screen appears.

Enter the Network ESSID, password type and password and click OK, returning to the Network Settings screen. The system will change the configuration and then nothing appears to happen. Click on the box on the left of the Wireless connection so that a tick appears and the system will attempt to establish connection. When it does the “aerial mast” icon should change appearance and the Network Manager daemon on the panel will show a connection.



The driver supports WPA/TKIP encryption but configuration cannot be done using network manager. It can be done by manually editing the /etc/network/interfaces file.

An example of a file follows:

```
auto lo
iface lo inet loopback

iface eth0 inet dhcp
```

```
#
iface wlan0 inet dhcp
pre-up ifconfig wlan0 up
pre-up ifconfig wlan0 down
pre-up ifconfig wlan0 up
pre-up iwconfig wlan0 mode Managed
pre-up iwpriv wlan0 NetworkType=Infra
pre-up iwpriv wlan0 AuthMode=WPAPSK
pre-up iwpriv wlan0 EncrypType=TKIP
pre-up iwpriv wlan0 SSID="wart8te"
pre-up iwpriv wlan0 WPAPSK="hellothere"
```

```
auto wlan0
```

Ubuntu Fiesty and the Edimax PCI and PCMCIA cards

Users of Ubuntu Fiesty with a PCI or PCMCIA card do not need to install the drivers from the CD as the new rt2x00 serialmonkey driver that is supplied with Fiesty works. The interface is detected as ra0.

Unfortunately as of May 2007 it is not possible to set the WEP key for the serialmonkey driver, so the /etc/network/interfaces has to be edited. From a console use nano:

```
$sudo nano /etc/network/interfaces
```

and then add the following lines, using the actual values in place of the bracketed items, so for example <your-essid> will become belkin54g

```
auto ra0
iface inet ra0 dhcp
    wireless-essid <your-essid>
    wireless-key <your-key>
```

use ctrl-O to write out the file and ctrl-X to exit

The card can be brought up using:

```
$sudo ifup ra0
```

If the card is subsequently removed and replaced then the commands:

```
$sudo ifdown ra0
```

and then

```
$sudo ifup ra0
```

will re-activate the card.

Instructions for Edimax Fedora 7 and 8 Edimax driver build

Note that these instructions only apply to kernels 2.6.22 and above.
You can find out your kernel version by typing:

```
# uname -r
```

It is anticipated that Fedora 8 will become available with the an upgrade to a 2.6.24 driver at which point the built-in drivers will work.

A. Building the drivers.

Become superuser

```
$ su -
```

and supply your password

Apply updates and also install Development Tools - you can use:

```
# yum -y update
```

The # in the line above represents the prompt, not something you type.

If you installed a new kernel during the update you should restart your machine with the new kernel.

Then:

```
# yum groupinstall "Development Tools"  
# yum -y install kernel-headers
```

Create a directory to work in and move into it:

```
# mkdir /root/ralink
```

```
# cd /root/ralink
```

Copy the files from the CD to this directory:

```
# cp /media/CDRALINK/fedora8/f8_install_rt61_rt73.sh .
```

(Yes, that's a space and a dot at the end as with the next command)

and

```
# cp /media/CDRALINK/fedora8/rt61-cvs-2007112109.tar.gz . for pci and pcmcia  
devices  
or
```

```
# cp /home/CDRALINK/fedora8/rt73-cvs-2007121004.tar.gz . for rt73 devices
```


then

```
# chmod +x f8_install_rt61_rt73.sh
```

Run the script: # ./install_rt61_rt73.sh

B. Setting up for WEP

Place the sample file myscript.sh in the root directory and edit it substituting your essid and key.

Add the line:

```
./root/myscript.sh  
at the end of /etc/rc.local
```

Shut down the machine.

Plug in the card, start the machine and things should work!

As an alternative to steps 4 to 8 do the following:

Put keys-wlan0 file in /etc/sysconfig/network-scripts

C. The following files may help in configuration:

instructions - this file

ifcfg-wlan1 - example configuration file, usually called ifcfg-wlan0 and found in /etc/sysconfig/network-scripts

keys-wlan0 - found in the same directory

There is an issue with the keys which needs to be sorted out to make ifup dhcp work.

myscript.sh - dhcp works with this

f7_rt61_manual_configuration - example of manually bringing a card up.

wpa - commands to manually set up wpa

General Instructions for Building the Drivers

Pre-requisites

Before attempting to install the drivers:

make sure that your system is up-to-date, for example:

```
apt-get update; apt-get upgrade      # Debian/Ubuntu
yum -y update                        # Fedora Core 6 and F7
```

check that your kernel version is not 2.6.22 or greater.

check that you have installed the necessary tools to enable kernel modules to be compiled, including gcc, make and a set of kernel headers consistent with the kernel your system is running. This is done as follows:

Debian Etch and Ubuntu: our install script will attempt to do this.

openSUSE: When installing, or adding post-install, use Yast and filter by patterns. check 'Basis Development', or more recently 'Basic Development' and 'Linux Kernel Development' under Patterns->Development.

Fedora:

When installing, check 'Development Tools' under Software Development->Development, or alternatively use:

```
yum groupinstall "Development Tools"
```

You may also need the kernel headers:

```
yum -y install kernel-headers
```

Of course, to update your system you will need an internet connection, so you'll need a wired connection for the install.

Ensure you have the necessary information to connect to your wireless access point:

ssid : eg, 'linksys', 'conexant', 'Default', 'my_cool_essid'

(if you've kept the default name, like above, you really should change it.)

hex wep encryption key: eg 742ab299fc94075a61872253a8

You may find it convenient, while setting up, to start with an open (unencrypted) connection as it reduces the scope for errors while you're experimenting. If so, make sure you encrypt it before you start using it in anger. If you can't encrypt the connection, choose an obscure ssid name, and set up the router so that the ssid is not broadcast.

Note: we have not yet tested, nor do our scripts allow for, WPA encryption.

Python needs to be installed for one of our setup scripts (most distributions will have Python by default).

Installing the drivers

Start with the card or stick unplugged.

In the directions below the characters \$ and # refer to the user and root prompts and should not be typed in.

Note that the linux console can complete filenames if only part of the name has been typed in by pressing the tab key.

Open a console window and log in as a root user.

In openSUSE, Fedora and Debian, use:

```
$su -
```

You will be asked for a password and then will obtain a # prompt

If you are using Ubuntu then use:

```
$sudo -s
```

to obtain a # prompt.

Ignore all literature and CD's supplied by the card manufacturer, they're either Windows-specific or have Linux drivers which probably won't work.

Create a convenient location to build the software, eg:

```
#mkdir /root/ralink
```

and then move into that directory

```
#cd /root/ralink
```

Place the Linux Emporium CD in your CD/DVD drive. It may well be auto-detected as /media/CDRALINK, or /media/disk, or you may have to mount it as something like /media/cdrom0. You can check by typing in:

```
#mount
```

and in the output you should see a line like:

```
/dev/scd0 on /media/CDRALINK type iso9660  
(ro,nosuid,nodev,uhelper=hal,uid=500)
```

This example is from Fedora 7. The string iso9660 tells you that it is a CD.

Untar the required files, in our case:

```
#tar xvf /media/CDRALINK/le_ralink_install.tar
```

At this point the CD is no longer needed. On most distributions the CD can be ejected:

```
#eject /media/CDRALINK
```

or

```
# eject /media/cdrom0
```

Now run the install script:

```
#./install_rt61_rt73.sh
```

You will be asked which driver you wish to install, and if the requirements above have been satisfied a driver will be built and installed. You may well see warnings during the build process, but these can usually be ignored. If you get errors you should attempt to put matters right before trying again.

Then you will be asked for your essid, the encryption type and the encryption key.

Following this it is advisable to shut down your system, unplug any ethernet cable and restart the machine.

At this point, depending upon your distribution, the wireless interface may come up automatically or have to be brought up manually.

Notes on specific distributions

Debian and Ubuntu

If you have a Debian or Ubuntu system, you should have a working wireless setup, which you can bring up manually:

```
sudo ifup ra0          # PCI/PCMCIA  
or  
sudo ifup rausb0      # USB
```

The devices cannot be hot-plugged, and if you attempt this an ifdown may be needed before using ifup.

Note that as of this time the network-manager-gnome tool which comes with Ubuntu Fiesty 7.04 will not work and you should use the command prompt to bring the card up and down.

OpenSuse up to 10.2

If you have an openSUSE system, you may be prompted to configure the interface. Accept the option and specify "traditional methods".

Then run:

```
#!/usr/local/bin/start_wifi
```

An oddity with SUSE is that, if the wired network connection is up, the dhcpd may refuse to run on the wireless system, if so put the wired connection down first:

```
#ifdown eth0
```

Fedora Core 6

If you have a Fedora Core 6 system the card will be automatically detected and the network will be brought up. The PCMCIA card can be both plugged and unplugged in a "hot" state and the presence of a connection is confirmed by the green link light. The activity light flashes yellow when data is being transferred.

Similarly the USB stick can be hot plugged. The small light on the top of the stick flashes when there is data activity.

Notes

The Ralink drivers use binary firmware files and configuration files which are installed in /etc/Wireless/RT61STA or /etc/Wireless/RT73STA.

The configuration files are named rt61sta.dat and rt73sta.dat. They are said to be 'binary files', to be edited with 'vi -b', but they look like Unix text files to me! The driver reads the config file when it is loaded, and although the Ralink and serialmonkey documentation say otherwise, we have found that essid and encryption have to be set in this file, and the file settings over-ride attempts to set parameters with, eg, iwconfig. Also, to read the new settings the driver has to be unloaded and then reloaded.

So these drivers do not co-exist well with the standard wireless tools, for example with openSUSE 10.2 essid and encryption have to be set in the Ralink configuration file AND with iwconfig.

To help with this we supply a Python script, set_essid.py, which will set these parameters, and which is installed in /usr/local/bin.

For openSUSE 10.2, we also supply a script, start_wifi, also in /usr/local/bin, which will start up wifi. Hopefully some one else will do the job properly.

Running

```
#set_essid.py
```

will prompt for card type, essid and encryption details, and update the appropriate Ralink configuration file in /etc/Wireless. Also, it will produce a new start_wifi script in the current working directory, ie it will not overwrite the one in /usr/local/bin.

Note that as the drivers are built against your kernel, if you upgrade your kernel then you must remake the Ralink driver.

Support

Please note that these scripts are provided 'as is' and the Linux Emporium is not able to provide unpaid support. However, email feedback is welcomed at info@linuxemporium.co.uk and we'd be very grateful for any information we could incorporate into our support CD to help all our customers.

Good Luck!