

Wireless Networking

Part 2 – Working with Linux

First find or decide configuration items

- If you have a router, check these on the router
 - If not – ad-hoc network – make decisions
- Sequence Set Identifier (ESSID)
 - A sort-of network identifier
- Transmission Channel (1-13)
- Key length (64 or 128 bits) and Key to be used
- Use of DHCP or manual configuration
 - If manual, need additional information and some networking knowledge
 - An ad-hoc network needs manual configuration

Is the adapter supported by your distro.?

- When you fire up the system do you get a light on the adapter?
 - Make sure a PCMCIA card is fully home
 - Light may be hard to see with PCI card
- A light is a good sign
 - No light is not so good
- Open the **Control Center**/re or **System** item on the menu and go to the **Network Settings** item
- The following slides show Ubuntu 6.0.6

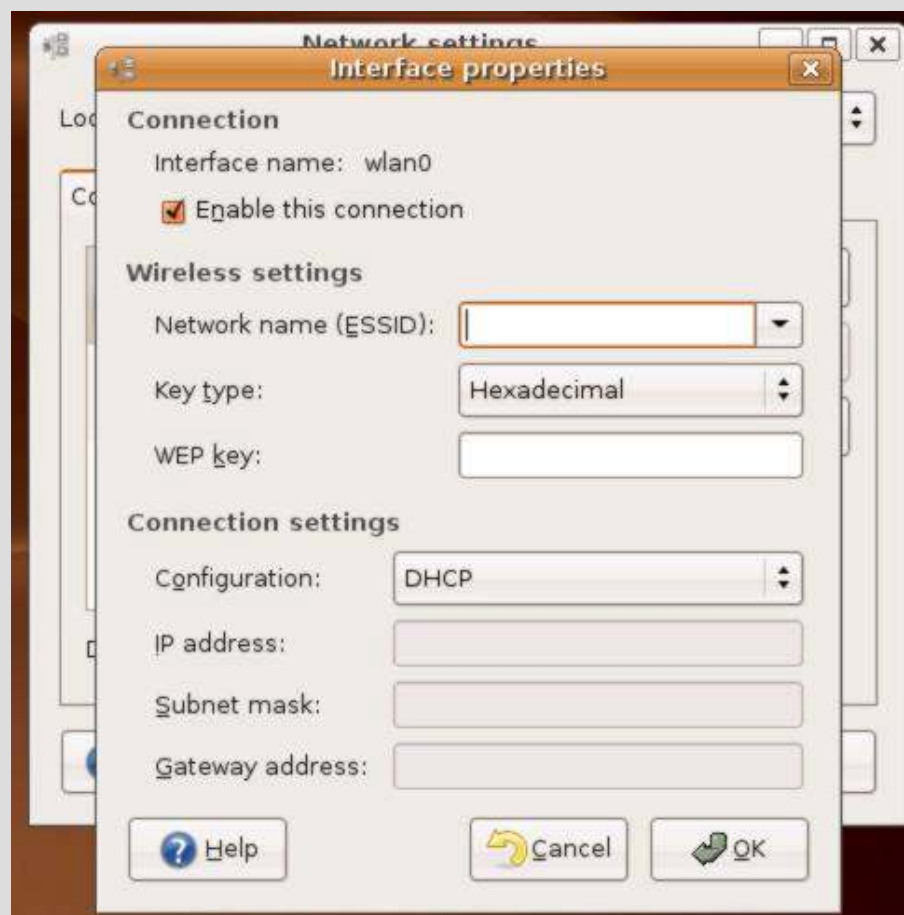
Entry from Network Settings

- The wireless connection is shown as **not configured**
- Click on Properties to set up the adapter



Setting up the parameters

- Set the ESSID (SSID)
- Set up the WEP key
- Choose DHCP or manual and enter IP address etc. if manual
- Click OK



Completing the setup

- With settings made, configuration is complete
- Click OK



What if the adapter is not natively supported

- You first need to find out something about your wireless adapter
- Having done that, you may be able to find a support module in the distro's repository
 - Synapt, Yast, Apt-get....
- With the support module installed, you should be then able to configure as previously shown
- If no support module....Oh dear!
 - But all is not lost, there are alternatives

How to find out about your adapter

- Check the documentation for the full name
 - e.g. Netgear WG511 V2 (made in China)
 - Makers have a nasty habit of keeping the names constant but changing the internals (chipset)
- The objective is to find the chipset (engine) and locate a support module
- An excellent source of info. is:
 - <http://linux-wless.passys.nl>
 - Shows make, model, VID:PID, linux support status
- Check the VID:PID against your machine's contents

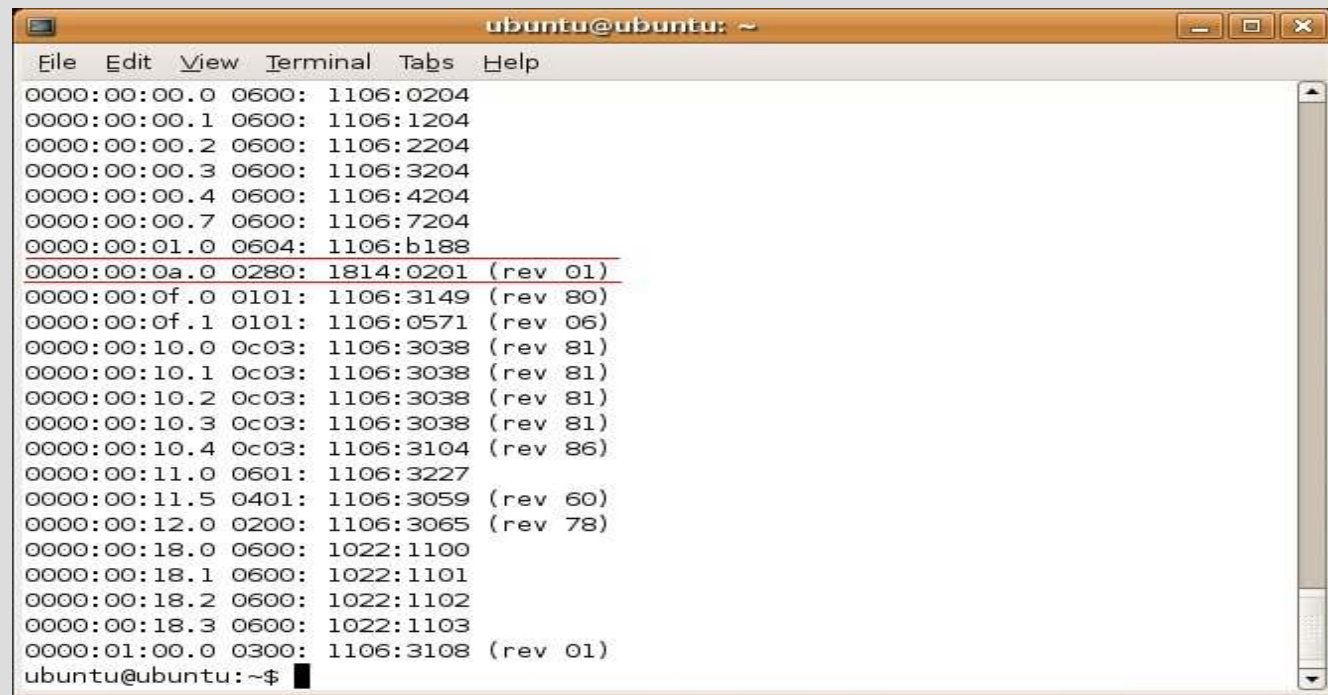
Vendor ID. And Product Id.

- Open a terminal/console window and type
 - `lspci -v`
- Output should contain something like this:

```
ubuntu@ubuntu: ~  
File Edit View Terminal Tabs Help  
  
0000:00:01.0 PCI bridge: VIA Technologies, Inc. VT8237 PCI bridge [K8T800/K8T890  
South] (prog-if 00 [Normal decode])  
Flags: bus master, 66MHz, medium devsel, latency 0  
Bus: primary=00, secondary=01, subordinate=01, sec-latency=0  
Memory behind bridge: e8000000-e9ffffff  
Prefetchable memory behind bridge: e4000000-e7ffffff  
Capabilities: <available only to root>  
  
0000:00:0a.0 Network controller: Ralink Ralink RT2500 802.11 Cardbus Reference C  
ard (rev 01)  
Subsystem: Micro-Star International Co., Ltd.: Unknown device 6834  
Flags: bus master, slow devsel, latency 32, IRQ 193  
Memory at ea000000 (32-bit, non-prefetchable) [size=8K]  
Capabilities: <available only to root>  
  
0000:00:0f.0 IDE interface: VIA Technologies, Inc. VIA VT6420 SATA RAID Controll  
er (rev 80) (prog-if 8f [Master SecP Sec0 PriP Pri0])  
Subsystem: Giga-byte Technology GA-7VM400AM(F) Motherboard  
Flags: bus master, medium devsel, latency 32, IRQ 169  
I/O ports at 9000 [size=8]  
I/O ports at 9400 [size=4]  
I/O ports at 9800 [size=8]  
I/O ports at 9c00 [size=4]
```

Vendor ID. And Product Id.

- Follow this with
 - `lspci -n`



```
ubuntu@ubuntu: ~  
File Edit View Terminal Tabs Help  
0000:00:00.0 0600: 1106:0204  
0000:00:00.1 0600: 1106:1204  
0000:00:00.2 0600: 1106:2204  
0000:00:00.3 0600: 1106:3204  
0000:00:00.4 0600: 1106:4204  
0000:00:00.7 0600: 1106:7204  
0000:00:01.0 0604: 1106:b188  
0000:00:0a.0 0280: 1814:0201 (rev 01)  
0000:00:0f.0 0101: 1106:3149 (rev 80)  
0000:00:0f.1 0101: 1106:0571 (rev 06)  
0000:00:10.0 0c03: 1106:3038 (rev 81)  
0000:00:10.1 0c03: 1106:3038 (rev 81)  
0000:00:10.2 0c03: 1106:3038 (rev 81)  
0000:00:10.3 0c03: 1106:3038 (rev 81)  
0000:00:10.4 0c03: 1106:3104 (rev 86)  
0000:00:11.0 0601: 1106:3227  
0000:00:11.5 0401: 1106:3059 (rev 60)  
0000:00:12.0 0200: 1106:3065 (rev 78)  
0000:00:18.0 0600: 1022:1100  
0000:00:18.1 0600: 1022:1101  
0000:00:18.2 0600: 1022:1102  
0000:00:18.3 0600: 1022:1103  
0000:01:00.0 0300: 1106:3108 (rev 01)  
ubuntu@ubuntu:~$
```

- Note VID:PID
- Now you can work out who made the chipset and can look for the correct support module(s)

What if I cannot find a support module?

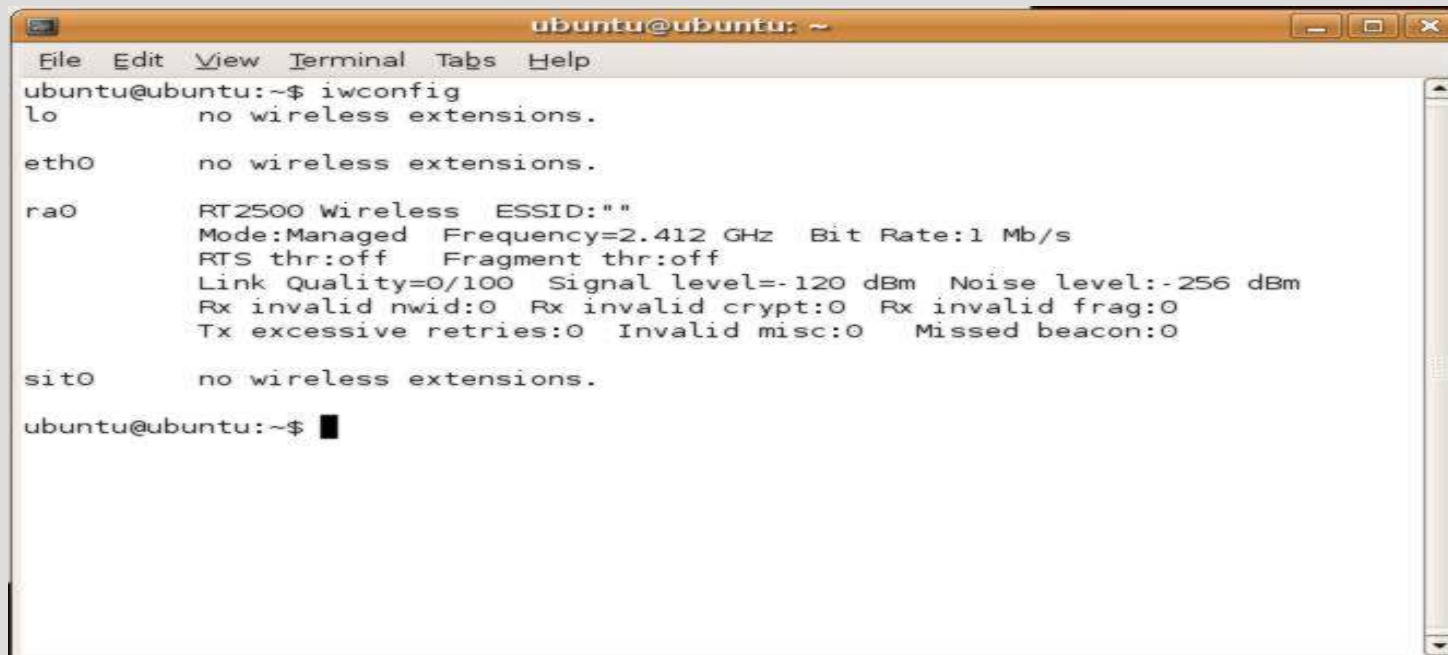
- Try Google with the VID:PID and “Linux”
- If no success with that it may be time to try [ndiswrapper](#)
- A Linux facility that wraps around Windows drivers written to the “Network Driver Interface Specification” (ndis)
- Ndiswrapper included with most distros.
- You can find reports of success with using ndiswrapper with many adapters at <http://ndiswrapper.sourceforge.net/mediawiki/index.php/List>

Setting up with ndiswrapper

- Find the Windows CD for your adapter
- Install the driver with a command of the form:
 - `ndiswrapper -i /mnt/cdrom/drivers/wizzbang.inf`
- This will install the driver ready for use
- Check what drivers are installed with:
 - `ndiswrapper -l`
- Now load the ndiswrapper module and activate the driver with:
 - `modprobe ndiswrapper`
- If all goes according to plan, your wireless interface should be active
- Now for the exciting part

Getting ready for business

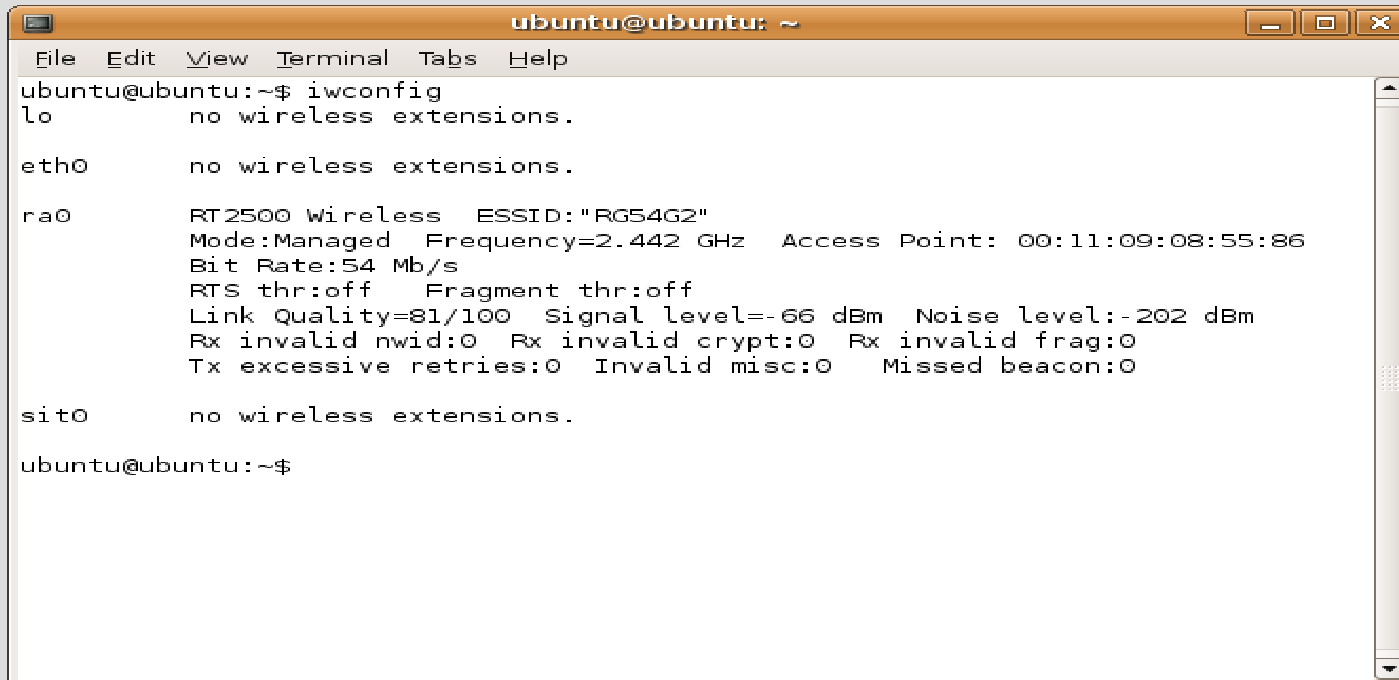
- Keep that console window open and type
 - `iwconfig`
- That will show if the wireless adapter is active



```
ubuntu@ubuntu: ~  
File Edit View Terminal Tabs Help  
ubuntu@ubuntu:~$ iwconfig  
lo          no wireless extensions.  
  
eth0       no wireless extensions.  
  
ra0        RT2500 Wireless  ESSID:""  
           Mode:Managed  Frequency=2.412 GHz  Bit Rate:1 Mb/s  
           RTS thr:off   Fragment thr:off  
           Link Quality=0/100  Signal level=-120 dBm  Noise level:-256 dBm  
           Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:0  
           Tx excessive retries:0  Invalid misc:0  Missed beacon:0  
  
sit0       no wireless extensions.  
ubuntu@ubuntu:~$ █
```

Getting ready for business (2)

- Now to configure it (example):
 - `iwconfig ra0 mode managed essid NSLIG channel 6`
- And check that it is active and connected
 - `iwconfig`



```
ubuntu@ubuntu: ~  
File Edit View Terminal Tabs Help  
ubuntu@ubuntu:~$ iwconfig  
lo          no wireless extensions.  
  
eth0       no wireless extensions.  
  
ra0        RT2500 Wireless  ESSID:"RG54G2"  
          Mode:Managed  Frequency=2.442 GHz  Access Point: 00:11:09:08:55:86  
          Bit Rate:54 Mb/s  
          RTS thr:off   Fragment thr:off  
          Link Quality=81/100  Signal level=-66 dBm  Noise level=-202 dBm  
          Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:0  
          Tx excessive retries:0  Invalid misc:0  Missed beacon:0  
  
sit0       no wireless extensions.  
  
ubuntu@ubuntu:~$
```

Getting Connected - finally

- If you have a router that acts as a DHCP and a local DNS (name) server
 - Either `dhcpcd` or `dhclient` should get you an IP address
 - Depends on the distro.
 - `dhcpcd` example:
 - `dhcpcd -t 10 -d wlan0`
 - `dhclient` example
 - `dhclient wlan0`
 - Now you should have an ip address and can talk to the world
- Check via `ping <ip address or name>`

Getting connected – manual config.

- Use `ifconfig` and `route` commands, plus adding DNS addresses to `/etc/resolv.conf`
- Ifconfig example
 - `ifconfig 192.168.1.22 netmask 255.255.255.0 ra0`
 - You have set the IP. Address
- Now to set the route to the rest of the world
 - `route add default gateway 192.168.1.244`
- Edit `/etc/resolv.conf` to name your DNS server(s)
 - `nameserver 192.168.1.244`
- And try it out with a `ping`

Are you talking yet?

- This has been a quick drive-by shooting of:
- Getting connected using a driver built in to your distro.
- Getting your adapter working using ndiswrapper
- Connecting using a router that supports DHCP and acts as a local DNS server
- Connecting by manually configuring the network setup items
- Not covered were:
 - Compiling drivers from source
 - Most of the complexities of network configuration
 - Wireless security in all its glory

Questions?

- Please keep the questions simple
- Don't delve too deeply into the technical stuff
- So that I have a chance of answering the questions