

LOGIN:  
Wireless in  
Linux: An  
overview

Mark Wallis

Wireless: The  
jargon

Linux Drivers

Problems ?

Conclusion

# LOGIN: Wireless in Linux: An overview

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# The jargon

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Just like every piece of new technology, we have a new set of jargon to learn

- 802.11
- specifically:
  - 802.11a
  - 802.11b
  - 802.11g
  - and now, 802.11n (not yet ratified !!)

# The hardware

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## Two main pieces of hardware

- The "client"
  - PCI/PCMCIA wireless card
  - USB wireless card
  - various "chipsets"
- The "access point"
  - essentially a wireless switch
  - standalone - or combined with your router
- The antenna
  - Built-in or add-on
  - Internal or External
  - Directional or Omni-direction

# Scanning

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Access points are configured with a name (the SSID) and a channel

- ESSID is just a string (generally less than 24 chars)
- Channel - 1 through 11 in Australia

# The connectivity

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Access points can generally be configured in various "modes"

- The standard
  - Access point only
  - Access point with WDS
- The above average
  - Point-to-point bridge
  - Point-to-multipoint bridge
  - Client mode

# The protection

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802.11 has room for both "authentication" and "encryption"

- None
- WEP
- WPA (TKIP)
- WPA2 (AES)
- Enterprise extensions - 802.11x

# The software

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## Two last pieces of the puzzle

- The driver
- The tools

# Drivers

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You need a driver for your wireless card just like any other Linux device.

- Dependent on your chipset
- Hopefully comes with your distro's kernel
- Sometimes they are "out-of-kernel"
- Sometimes multiple drivers for device
- ..... <http://www.linuxwireless.org/en/users/Devices>

# The "stack"

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Common layer of abstraction for the 802.11 protocol

- Old school - roll your own
- ieee80211 (Intel)
- Devicescape
- which become mac80211

# The "driver"

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## A list of popular linux chipsets/drivers

- Ralink (rt2400 ..... rt2800)
- Broadcom (b43, used to be bcm43xx)
- Intel (ipw2200, iwlxxxx, various)
- Atheros (madwifi)

# The "tools"

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Tools are required to allow you to tell the driver about the Wifi network you wish to join

- Old school - "Wireless Tools" (iwconfig, iwlist, iwpriv, etc)
- Fancy GUI - "Network Manager" and "kNetworkManager"
- Behind the scenes - "wpa supplicant"

# Troubleshooting

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What if all this doesn't work ?

- 1. What chipset do you have (lsusb, lspci)
- 2. Which driver matches that chipset (google)
- 3. Do you have it and is it loaded ? (lsmod)
- 4. Did the driver find your card ? (ifconfig)
- 5. Will it accept wireless config commands ? (iwconfig)
- 6. Have you configured the card correctly ?
- 7. Then it's probably a bug - upgrade your kernel
- 8. Ask for help

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- The problem = evolution
- The solution =