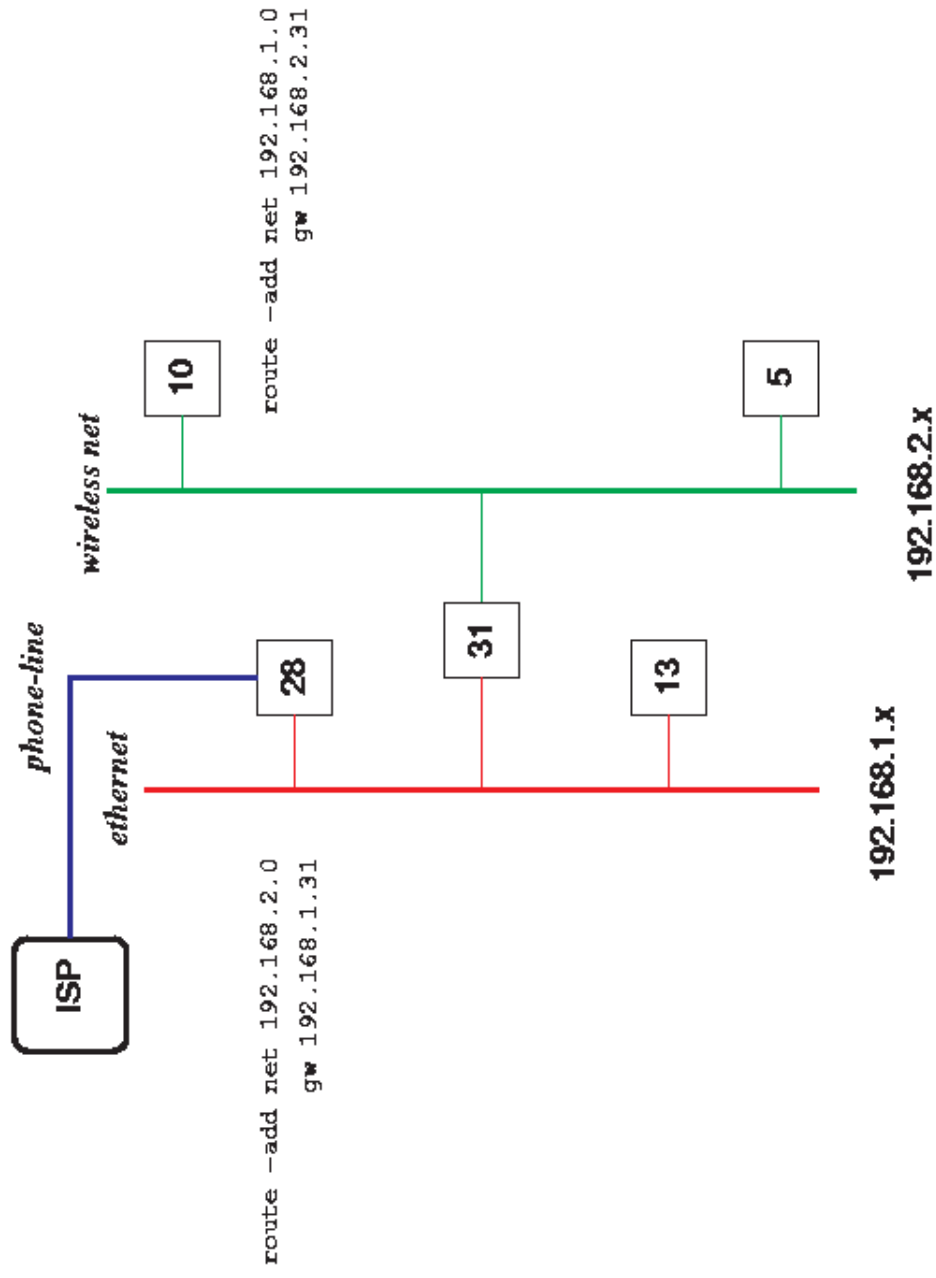


Wireless Networking in Linux

Peter Teuben

Wired vs. Wireless



Networking: TCP/IP

- Ethernet
- Serial (PPP, SLIP)
- Parallel (PLIP)
- IrDa
- AX.25 radio amateur
- Digital mobile phone (GSM, TDMA, CDMA)
- Digital Modems (ricochet, ARDIS)
- WLAN (**THIS TALK**)

Wireless Networking

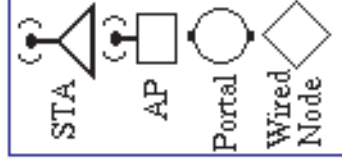
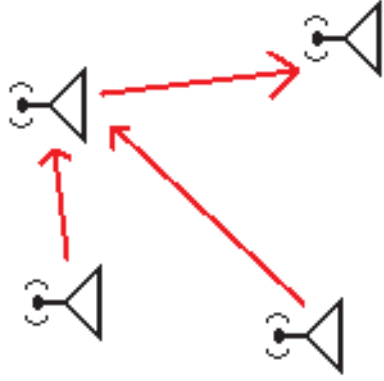
- wired vs. wireless (900MHz, 2.4GHz, 5GHz)
- Direct Sequence vs. Frequency Hopping SS
- proprietary protocols
- HiperLan
- IEEE 802.11 (ethernet)
- CSMA/CA: "listen before talk"
- Wireless Extensions [[Jean Tourrilhes](#)]
(`/usr/include/linux/wireless.h`)

Wireless Networking: Devices (1-2Mbps)

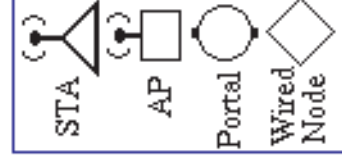
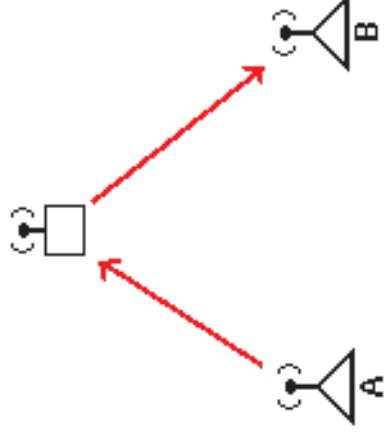
- Lucent WaveLan/DEC Roamabout DS
- Lucent Wavelan IEEE (+binary)
- Netwave AirSurfer
- Baystack 660, ZoomAir (PRISM) **** YDI ****
- Proxim RangeLan2
- Aironet ARLAN (+802.11)
- Raytheon Raylink
- **Breezecom (up to 11Mb)**
- **(future) Lucent WaveStar OpticAir (20 Gb)**
- **AirPort - iBook (11Mb)**

wireless networking: network topology

- InstaWave
- ad-hoc (802.11)
- peer-to-peer
- point-to-point
- can use AP too

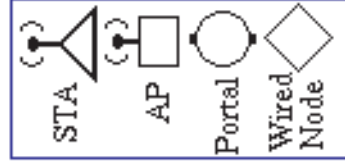
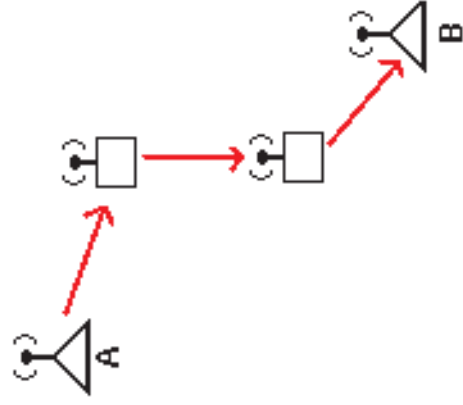


- StructureNet
- infrastructure (802.11)
- needs AP ("hub")
- one-to-one
- roaming possible

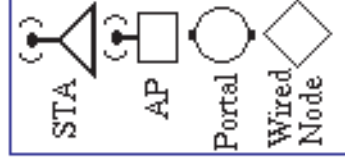
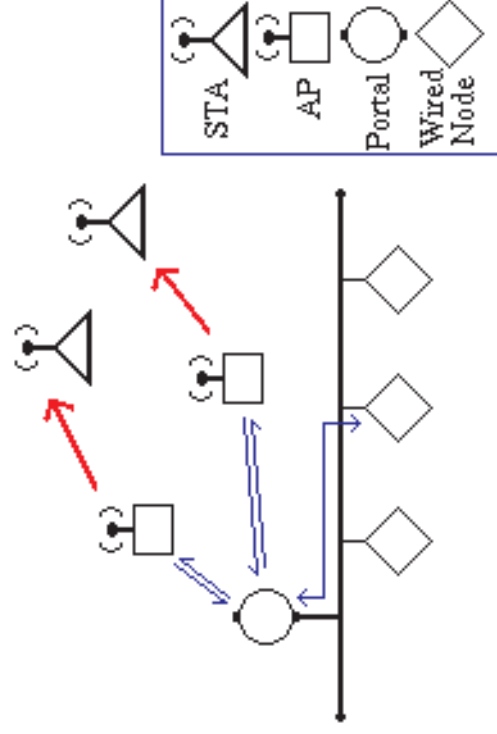


Network Topology (cont'd)

- AP roaming



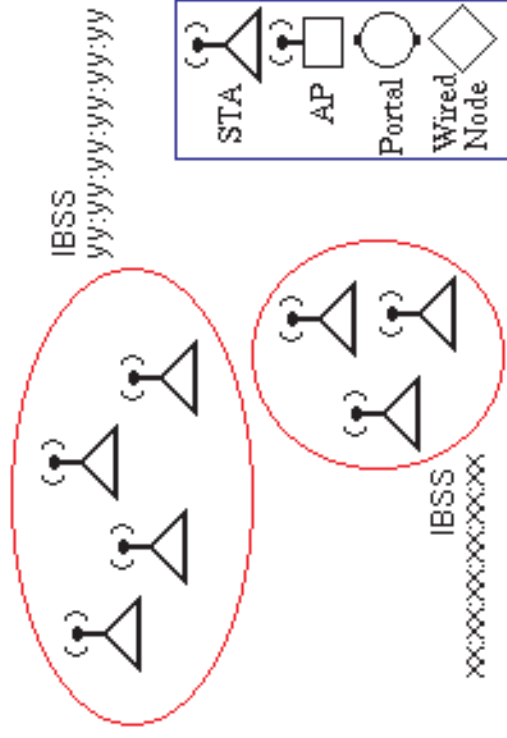
- Portals



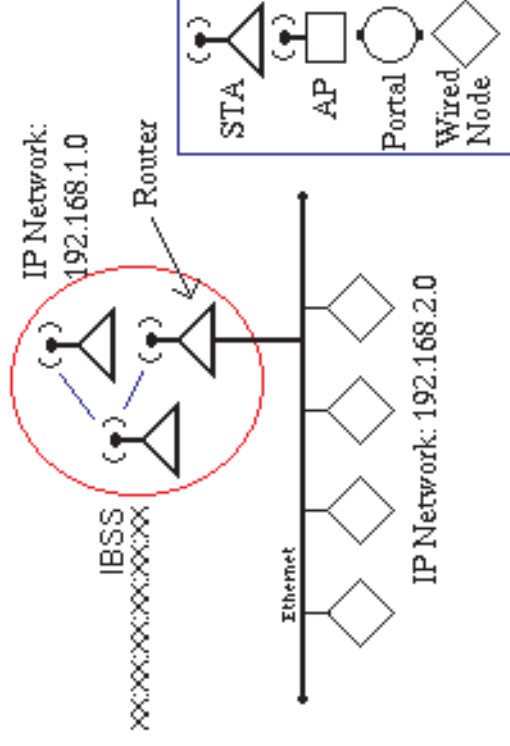
Network Topology (cont'd)

Ad Hoc WLAN (InstaWave)

- IBSS



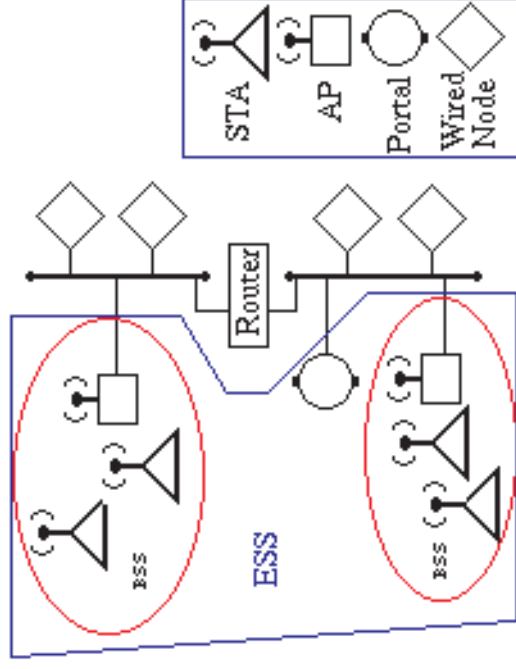
- w/ router



Network Topology (cont'd)

Infrastructure WLAN (StructureNet)

- ESS



Example setup script

```
V=`uname -r`
M=/lib/modules/$V/pcmcia/am930_isa.o

# WLAN card usage
CHANNEL=6
SSID=my_secret_wlan

# WLAN PnP setup
IRQ=9
IOBASE=0x240

# Network setup
E=eth1
IP=192.168.2.31
NM=255.255.255.0
BC=192.168.2.255
NW=192.168.2.0

# Insert the AM930 module:
insmod $M am930_irq=$IRQ am930_iobase=$IOBASE

# make sure the interface is down
ifconfig $E down

# get the card going on this interface
wlanctl $E scan 1 11 100 ff:ff:ff:ff:ff:ff both active
sleep 2
wlanctl $E netlist
wlanctl $E bsscreate $CHANNEL 300 0 $SSID

# start up the network
ifconfig $E $IP broadcast $BC netmask $NM
route add -net $NW netmask $NM $E

# Add static routes. Make sure you add the reverse routes on the other end
# route my regular ELAN
route add -net 192.168.1.0 gw wxavier
```

Example Setup Script

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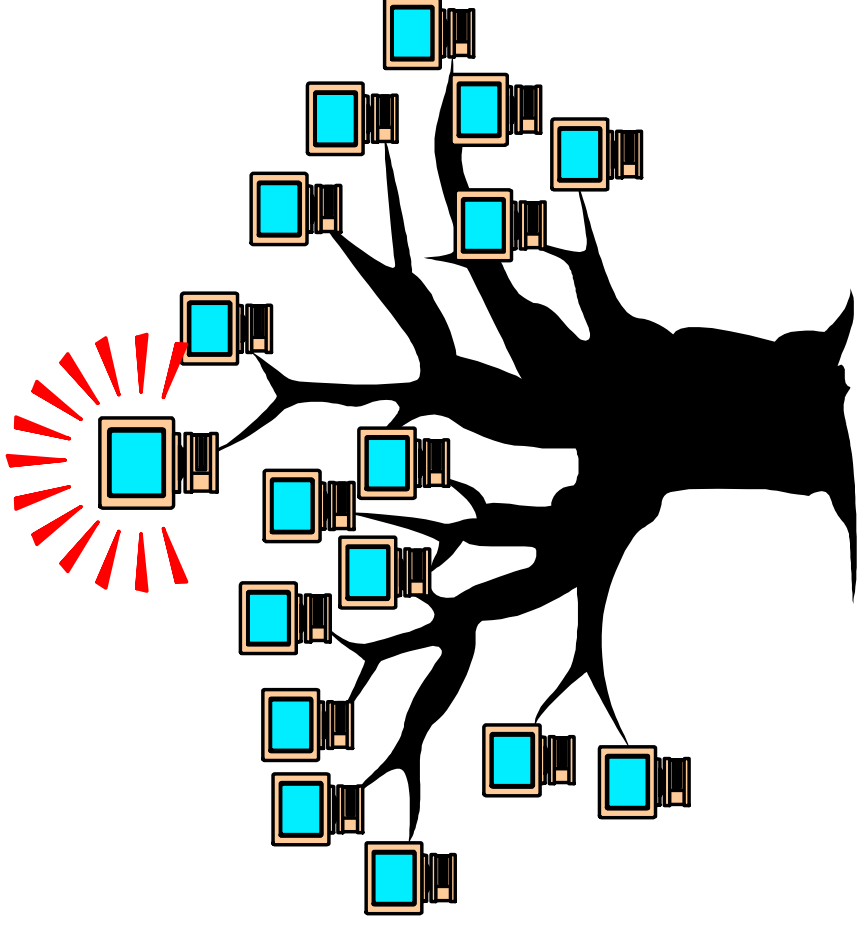
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Wireless Networking: references

- <http://www.astro.umd.edu/~teuben/linux/wireless.html>
- Linux Wireless LAN Howto (Tourrilhes)
- IEEE 802.11 WLAN page (Absoval)
- AX.25 HOWTO

Wireless Networking



Pizza Anybody?

