OSDL Wireless Summit

April 7, 2006

Linux 802.11 from the perspective of a community wireless group

The Personal Telco Project

www.personaltelco.net

about Personal Telco

- A volunteer-based 501(c)3 non-profit corporation dedicated to:
  - "*promote and build public wireless networks through community support and education*"
- Started in August 2000 by unemployed geeks.
- Support installation and operation of about 100 free wireless hotspots in/around Portland.

beyond hotspots

- user owned/operated communications infrastructure
- using off-the-shelf and hacked technologies to route around telco monopoly damage

a typical Personal Telco hotspot

- DSL connection from friendly ISP
- Linux-based router, running a captive portal (e.g. NoCatAuth)
  - to limit node owner liability
  - to provide a mechanism for communicating with users
- A consumer-grade Access Point with SSID: www.personaltelco.net

a typical rooftop node

- DSL from a friendly ISP
- A single-board computer (e.g. Soekris 4826), in a weather-proof enclosure:
  - mounted to a chimney
  - with an omni antenna
  - power over ethernet (PoE 802.3af)

a current project

- Mississippi Grant Project
  - An effort to provide free wireless internet to a neighborhood in North Portland.
  - ~$15k grant paid for hardware
  - internet connection donated by a friendly ISP.
  - Uses dual radio soekris boards, Atheros radios, 802.11a backhaul, b/g local service
  - Covers an area about a ½ mile square.
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other projects

- Experimenting with MIT's roofnet
- Experimenting with OLSR
- Building a network stumbler device using a Netgear WGT634U
- Building a two-radio “repeater” device using a Netgear WGT634U and a USB radio.

linux wireless needs

- 802.11 a/b/g driver support:
  - atheros
    - master and managed mode
    - adhoc mode (for mesh protocols)
    - wds (to support our MGP project)
- driver support for USB radios, e.g.:
  - zd1211
    - monitor mode (for stumbling)
    - should support more than one device at a time
    - our repeater mysteriously loses association

linux wireless needs

- support non-PC architectures (e.g. for embedded devices, OpenWrt and similar)
- common feature support across hardware