

OSDL Wireless Summit

April 7, 2006

Linux and 802.11 from the perspective of a
community wireless group



The Personal Telco Project

www.personaltelco.net

Community Wireless Internet
in Portland, Oregon

Outline

- Community Wireless Internet
- Typical Personal Telco Nodes
 - Indoor/Hotspot
 - Outdoor/Rooftop
- Mississippi Grant Project
- Linux Wireless Needs

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.

The Goal

- User owned/operated communications infrastructure...
- Using off-the-shelf and hacked hardware to route around Telco monopoly damage.
- Learn, Educate, Build, Share.

A Typical Indoor Hotspot

- DSL connection from friendly ISP.
- Linux server acting as gateway and captive-portal (e.g. NoCatAuth)
- A consumer-grade Access Point with SSID: “www.personaltelco.net”
- Often located in a cafe and serving a dozen or more users a day.





Office DEPOT

FRAGILE

Canon

L50

A Typical Outdoor/Rooftop Node

- DSL connection from friendly ISP.
- A single-board computer (e.g. Soekris 4826), in a weatherproof enclosure:
 - mounted to a chimney
 - using 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.
 - Operating on \$15k grant
 - Internet connection donated.
 - Uses dual-radio soekris boards, Atheros radios, 802.11a backhaul, b/g for local service.
 - Covers about a ½ mi square

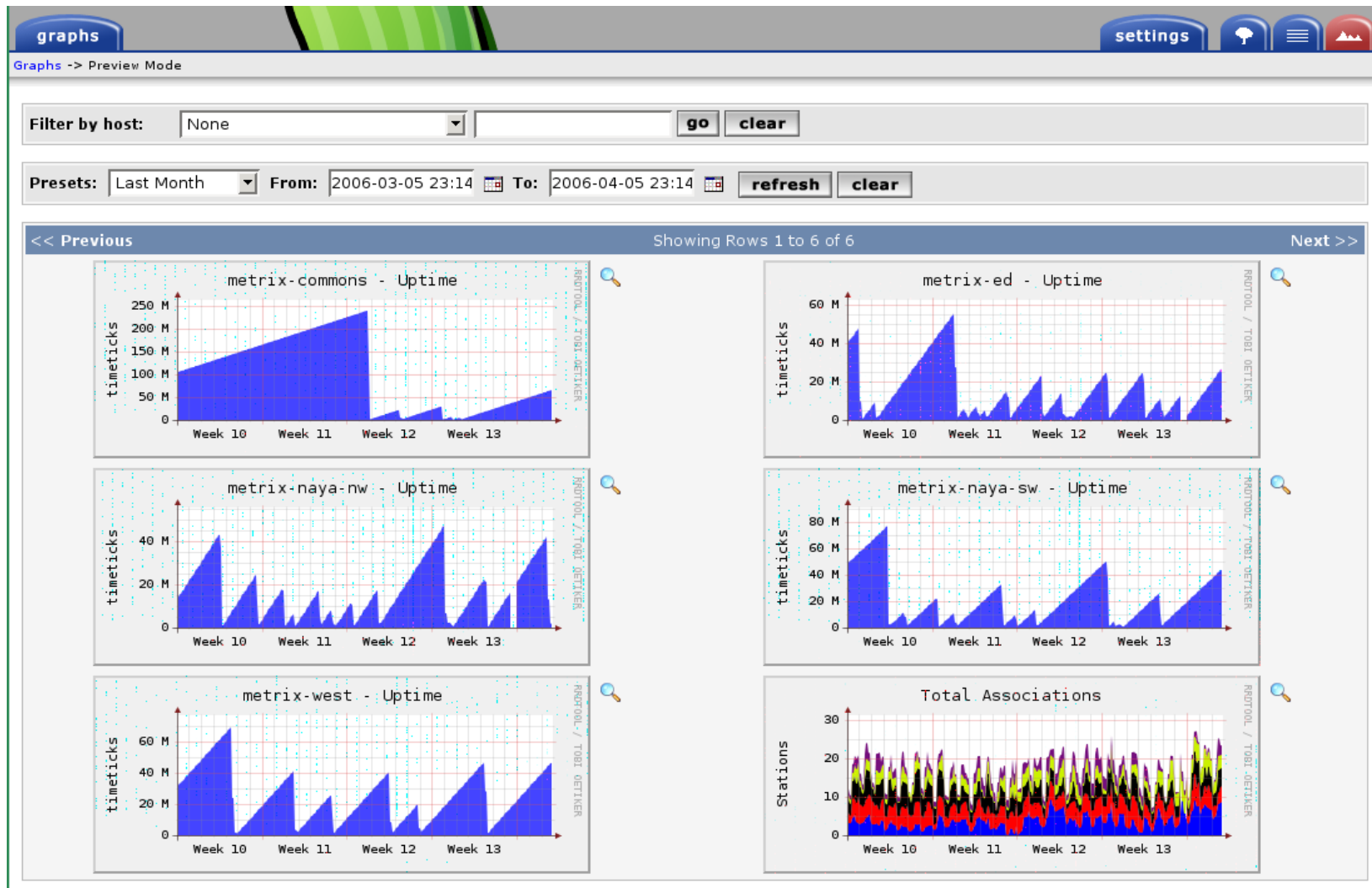
Other Projects

- Experimenting with MIT's roofnet
- Experimenting with ad-hoc mode/OLSR
- Network stumbling using a Netgear WGT634u running OpenWGT (Linux)
- Building two-radio “repeaters” using a Netgear WGT634u and a USB radio.

Linux Wireless Needs

- 802.11 a/b/g driver support. e.g.,
 - Atheros (madwifi):
 - master and managed modes
 - adhoc for mesh
 - wds

Linux Wireless Needs



Linux Wireless Needs

- Driver support for USB radios. e.g.,
 - Zydas (zd1211)
 - monitor mode (for stumbling)
 - should support more than one device at a time
 - our repeater mysteriously loses association
 - documentation: Zyxel USB radio does not work with zd1211 despite manufacturer's claims
- Support for non-PC architectures (e.g. for embedded devices: OpenWRT and similar)