

# A Very Quick Introduction to 802.11 & Community Wireless Networking



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# 802.11 / WiFi /

## Wireless Local Area Network

- Equivalent of a wired LAN without the wires.
  - Free to roam
    - Within an office/home
    - Small location of a city.
      - IE. NANs, SFLAN, BARWN
  - Fast connection
    - 802.11a – 54Mb/s @ 5.8 GHz
    - 802.11b – 11Mb/s @ 2.4 Ghz
    - 802.11g – 54Mb/s @ 2.4 Ghz
  - No copper infrastructure needed.
    - Depending on what you need for your network, it could be cheaper than copper.

# 802.11... (cont.)

- One of the first industry and customer base adopted standards.
  - Well adopted.
    - IEEE standard - <http://www.manta.ieee.org/groups/802/11>
    - WiFi – Certify interoperability between equipment
    - Cisco/Aironet, Agere/Orinoco/Proxim, Breezecom, Symbol/3Com, Xircom/Intel
      - Ie: Apple Airport, Linksys WAP
- Very low cost.
  - Access Points \$50 - \$1000 / Client cards \$30 - \$100.

# Industry Usage

- InterOffice/Home (traditional)
  - Make wired LAN accessible to wireless clients
- Point to Point Office Links
  - Connect two wired networks with wireless bridges
- Wireless ISPs (popular in mid-west & 3rd world countries)
  - Where broadband (ie. xDSL/Cable modems) infrastructure doesn't exist or is too costly.

# Industry (cont.)

- Commercial Hot Spots
  - Surf and Sip, Boingo (Cafes, Restaurants)
  - T-Mobile, Wayport (Airports, Hotels)
- Grassroot Community Networks
  - Seattlewireless, Personaltelco (Portland), Consume (London UK), NYCwireless (NY, NY)

# Public WiFi or NANs

- Last mile cost is \$0
- Traditional telco infrastructure does not need to be involved
- Networks do not have to connect to the Internet.
  - SeattleWireless is just concerned about providing bandwidth to each other.
  - Bring your own internet

***How does the city and public  
benefit?***

# Neighborly thing to do.

Community networks help get people into their neighborhoods to meet each other and help each other participate.

That's ultimately good for the city.

# Digital Divide

- Extends the efforts of the city to provide Internet access. Much beyond attempts such as the terminals in the libraries.
- Some areas in San Francisco do not have access to DSL as they are in an area that isn't served or are too far away from the Central Office. With the downturn in the economy, this problem will likely not be rectified in the near future by commercial interests.
- Even if they can access the Internet, at \$50 a month some folks will see food and rent as more of a priority over network access.

# Public Safety

- Fast Network – Over the 19.2Kb/s of the current system. 802.11 can be 570 times faster.
- Parallel infrastructure is ideal for backup (or concurrent) emergency communications.
- Common Intra and Interdepartmental network.
- Can be utilized in extreme emergency conditions such as the '89 earthquake.
  - Neighbor Emergency Response Team
- Everyday applications:
  - Building and Fire inspection via Tablet PCs

# Competition

- A city-wide community network promotes business and competition, as anyone can participate and offer services.
  - Much like Palo Alto's fiber ring.

# Could keep other providers competitive

- The latest FCC ruling that feds do not regulate the copper for the last mile. This could be the death knell for competition for DSL providers.

# Increases City and Business Revenue

- Encourages commerce as tourist and business visitors will likely stay (and shop) in SF if a public network is there.
- Also encourages park use and benefits businesses surrounding the parks.

# Experimentation Test Bed

- Test bed for experimentation for public and commercial use.
  - Feeding public access content to cable access channels.
  - Art pieces.
- Provides better access to the community for news reporting.
  - Via photo blogging.
  - BBC news asking for images from clients.

# BARWN

- Community wireless network based in San Francisco.
- Affiliated with the Bay Area Wireless Users Group - <http://www.bawug.org>
  - Currently incorporating in California as a non-profit
- Currently has an access point located on a mountain top just south of San Francisco serving the south half of San Francisco, Colma and Daly City.

# BARWN Objectives

- Development and documentation of long range (>2 mile) wireless networking using very low cost, commodity unlicensed radio transceivers.
- Be a wireless network test bed for developing new protocols or "tuning up" current protocols such as dynamic routing protocols originally designed for "wired" networks.
- Research into the deployment of remote LANs for the support of public safety events and incidents.

# BARWN Objectives...

- Provide a “back-bone” to tie together other communities and groups.
- Respond to the loss of bi-directional expression on the Internet through experimentation with true broadband access to the home with features including:
  - Limited AUP restrictions.
  - Symmetrical bandwidth.
  - No port filtering.
  - Real static address space.

# How you can help...

- We would like introductions to city departments that have a need for networking.
- Such as:
  - Emergency Services
  - Western Addition Community Center
- Be involved in City communications policy making
- Be the expertise for public wireless access.
- Review proposals.

# How you can help...

- Access to city owned fiber
  - Backbones to access points
- Roof / tower access
  - City buildings such as libraries and community centers.
- Financial resources
  - Grants or resources to attain grants.
  - Partial fee from commercial use could go to community access



Thank you for this opportunity.

This presentation is available at:

<http://www.barwn.org>

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