News

It's a WLAN-derful Life
Greg Goth

The technological, legal, and economic frameworks around free and low-cost wireless municipal and community-run networks have undergone many changes. Perhaps the most significant is the emergence of a new class of organization to sponsor or construct those networks.

The earliest IEEE 802.11 (WiFi) networks were built under the aegis of either shoestring community groups, university researchers, or municipalities, often in the face of fierce opposition from incumbent carriers. Recent community networks, however, have originated with businesses that have large telecommunications-dependent markets but haven’t been involved with data transport itself. Within the space of three weeks, two new WiFi networks embodying the new model made news in northern California’s Silicon Valley.

In mid-August, Google launched Google WiFi, a free wireless network for users in the city of Mountain View. In early September, a consortium including IBM, Cisco, Azulstar, and SeaKay won a contract for a 1,500-square-mile network intended to serve 42 entities and 2.4 million people in Silicon Valley, including every city in both San Mateo and Santa Clara counties. The consortium will build, own, and operate a high-speed, outdoor, wireless network as specified by the regional sponsors.

“Googlesque ethos”
Sascha Meinrath, cofounder and project director of the nonprofit Champaign-Urbana Community Wireless Network in Illinois, says the emergence of private-sector-led networks is an intriguing development from legal and cultural standpoints. Although Google WiFi, for instance, isn’t technologically revolutionary, it introduces the concept of businesses other than telecommunications carriers as logical community network proprietors.

“What’s interesting about it is that Google corporation made a decision to say, ‘Hey, we benefit in some way by providing connectivity to our local community,’ and it shows in some ways a return of corporate responsibility of doing good for your local community. And that’s very interesting,” he says, “because very few corporations are doing that. In terms of what’s happening worldwide, I think you see a lot more of that Googlesque ethos in corporations wanting to do good for their local communities.”

Esme Vos, operator of Amsterdam-based Muniwireless.com, says that the municipal and community wireless network climate is far more active in the US than elsewhere. That doesn’t mean the rest of the world is lagging in connectivity, however.
the US pursues the wireless option as an alternative to incumbent broadband
providers, the European Union is focusing more on fiber to the home. According to
Vos, FTTH networks will offer last-mile subscribers bandwidth rates that far surpass
what’s available in the US. For example, in Rotterdam, one of the city’s social
housing corporations will offer 30 megabits of symmetric service for 7 euros a
month. In Paris, customers of the Iliad Group (pdf) will be able to get 50 megabits of
symmetric bandwidth for 30 euros. Vos says that a less entrepreneurial culture and
stricter power-output regulations for networking mesh nodes have inhibited Europe’s
wireless network growth. Nevertheless, the new wired infrastructure will compel
service providers, who operate under strict local-loop unbundling regulations, to
explore new wireless services.

“At some point,” she says, “they will all use that fiber to be the backhaul for a
ubiquitous wireless broadband network. It’s not a bad thing at all. If you want high-
bandwidth applications on wireless, you need that cheap backhaul.”

Meinrath confirms that the European market focus on last-mile fiber includes thinking
about ways to use the symmetrical bandwidth that becomes available with it. FTTH
networks will support roughly equal data rates both ways.

“I just returned from Finland, home of Nokia,” he says, “and obviously they’re going
to be interested in wireless, but they’re also interested in building wireless systems
that go far beyond what we’re talking about here. In the US, when I talk to decision
makers, I tell them, ‘If you’re building a network based on Internet service provision,
you’re building the wrong network. You need to build a network that allows for peer-
to-peer communication.’ In the US, people are shocked when I say that, but the
Finns take it for granted. They’re thinking, “How can we use this for local media
production? How can we use it for directly connecting people to communities?’”
Meinrath adds that municipalities are also much further along in thinking about ways
symmetric network capabilities can spur economic development.

One valley, two models, many implications
Network observers will be watching Silicon Valley closely over the next several
months as Google WiFi gains users and the larger wireless project starts fleshing out.
Google owns the 11-square-mile Mountain View network and doesn’t plan to charge
for access. The larger network, however, is envisioned as a combination public-
benefit and wholesale model, in which competing ISPs will offer tiered services priced
accordingly.

Incumbent carriers haven’t yet complained about these networks. This contrasts with
the first wave of metro wireless networks, which called up armies of lobbyists in
state legislatures. The telecommunications companies often argued that a
municipally backed wireless network infringed on market forces meeting demand.

“They basically have thrown in the towel,” Vos says. “They lost in almost all of the
states except one, and it was really hurting them in their fiber deployment. They
have to get permission from local authorities and if they anger them, that hurts that
angle.”

Chris Sacca, who’s overseeing Google WiFi as head of special initiatives for the
company, sees some interesting cross-pollination going on in Silicon Valley. Sacca
says he recently was named to the board of directors of Joint Venture: Silicon Valley, the regional organization promoting the wireless network. The day he attended his first board meeting, so did another new designee—who works for AT&T.

In fact, AT&T joined the crowd offering community WiFi. In August, the company signed a development deal with the city of Springfield, Illinois. According to the city’s announcement, AT&T proposed deploying a mesh wireless system in roughly a 30-square-mile area of the city and installing a point-to-point wireless system in the remainder of the area.

"Specific mapping of the city has not yet been done, but mesh connectivity could be expanded depending on population characteristics and its density," said Springfield mayor Timothy Davlin.

While veterans of the community/municipal wireless community are happy to see the incumbents retreat from their outright opposition, some are also sounding notes of caution. Using an incumbent might appear to be the least risky option, but telecommunications attorney and commentator Harold Feld says that deals such as Springfield's also have pitfalls:

"One possible reason for wanting a muni system is that it can provide some much needed competition to a market with only one or two broadband providers," Feld wrote. "If you use the incumbent, you don't get 'competition' so much as 'extension.' The muni system becomes the low-cost version of the incumbent offering picking up a different market segment, rather than a real competitor that can force the incumbent to lower prices, maintain good customer service, and offer innovative new packages."

Although observers have been offering numerous opinions on Google’s fundamental motivation behind its free network, Sacca says the company didn’t plan a network with a bottom line in mind. “Historically, what we found at Google is, focus first on an end-user problem. Then, from there attempt to create value, and if you do that correctly you'll be rewarded for doing so,” he says. “And in this case, you have 47 percent of American households with one or no broadband providers.”

Sacca says one possible revenue stream for any enterprise or consortium looking to operate a local network is that staple of traditional local media such as newspapers and radio stations: “The local advertising market is really interesting,” he says. “I don't have the monetization model worked out for that yet, but the 'back of the envelope' estimate would tend to be favorable. I see the business model evolving but we have no hard figures yet.”

Meinrath says local media visionaries should be looking at wireless network construction as the next step in capturing customers. “Right now, you'd be fortunate to find a radio station for less than a few million dollars in a big market. The alternative of blanketing a community with a community wireless network, and owning the splash page with your media, is incredibly cost-effective,” he says. “It amazes me we don't see more people do it.”

Meinrath adds that more entrepreneurs might take the risk of investing in wireless networks as open source mesh software matures and associated hardware costs
continue to fall. For example, the Meraki Mini, one of the most talked-about new mesh appliances, is being offered to early adopters for US$49. It's based on the MIT Roofnet project, in which an approximately 40-node unplanned mesh network was shown capable of delivering an average internode throughput of 627 kilobits per second (almost twice that of typical residential ADSL data rates) despite an average route of three hops per measured message.

According to muniwireless.com’s Vos, the networks will truly bloom once truly Internet-capable personal devices have reached critical mass. “I think the whole thing will really take off when we finally get really portable devices—that is, phones with WiFi capabilities,” she says. “We’re really at the early stage, but it’s moving that way. There’s nothing you can do to stop it, which is why AT&T decided not to try but to go and do it.”

Related Links

- DS Online's Peer-to-Peer Community
- "Towards an Ecological Perspective on the Evolution of Online Communities of Practice," Proc. HICSS 06
- "Municipal Wi-Fi: Big Wave or Wipeout?" IEEE Internet Computing

Cite this article:
Greg Goth, "It’s a WLAN-derful Life," IEEE Distributed Systems Online, vol. 7, no. 10, 2006, art. no. 0610-ox004