

THE INTERNET AMENITY

Before I started writing this column for *Technology Review*, I spent eight months as the “chief scientist” for an Internet startup called Broadband2Wireless. (In fact, I was the only scientist.) Our company tried to build a high-speed wireless Internet service that could be accessed in cities throughout the United States, South America, Europe and Asia. We were going to do it using unlicensed portions of the spectrum and with wireless network equipment that employed a hot new standard called 802.11. And we were going to charge no more than \$50 a month.

Of course, we failed. We had \$30 million in funding; we needed \$200 million. We had a handful of good engineers; we needed dozens. Nevertheless, our company’s basic vision was right on target. We knew that one day there would be a pervasive wireless Internet that’s as easy to use as today’s telephone network. Within 10 or 15 years’ time, practically every computer and every handheld device will be online all the time.

What many people don’t realize, however, is that this visionary network is increasingly up and running today. And it doesn’t even require any new technology, business models or significant investment. Indeed, if there is a single difference between the Broadband2Wireless mission and the reality of this new ubiquitous network, it’s that the real wireless Internet doesn’t cost \$50 a month—it’s free. All that’s required, really, is openness.

One of the most surprising things we learned from launching our Internet startup was that providing wireless Internet service is really cheap. What ended up bankrupting the company were all the ancillary services we had to develop—credit card billing, technical support, the corporate Web site and the various security measures we had to put in place to prevent unauthorized use of the network by nonsubscribers. Organizations that aren’t trying to make money providing wireless Internet service can do away with all of these measures and offer the service for free.

This isn’t just some techno-utopian notion—it’s today’s reality. Of course, there’s not much incentive to set up towers and deliver free wireless broadband to homes that can’t get high-speed Net access through cable modems or digital subscriber lines. But many businesses and universities are doing their part right now by making wireless Internet service available without restriction in their buildings and nearby public areas.

The other day, for example, I was at the Boston University school of journalism to have lunch with a friend, but he wasn’t there. Realizing that I was half an hour early, I took out my laptop and discovered that I was getting an excellent signal from the school’s wireless network. But I didn’t just get a signal—the university’s network helpfully gave my laptop an address on the Internet. Within moments I was downloading my e-mail and surfing the Web. When I shut down my computer 30 minutes later, the address was automatically returned to the university. And since the J-school’s network wasn’t running at full capacity at the time, even my minor use of bandwidth had no impact on other users. Total cost to Boston University: zero. (The same thing happened a



few weeks later when I was at Harvard's John F. Kennedy School of Government.)

Sadly, however, not every wireless network is open. A few of the schools and businesses that I have visited have set up blocks to lock out "unauthorized" wireless cards—much as we tried to do at my wireless startup. Fortunately, more organizations are realizing that it's easier, friendlier and ultimately cheaper to have a network that's open to employees and visitors alike.

Essentially, the schools were providing me with wireless "IP tone," the 21st-century equivalent of telephone dial tone. (IP stands for Internet Protocol.) Bring your own hardware and a wireless local-area network card, and you can get on the Internet for free.

It's free for the schools, too. Well, almost free. Assuming an organization already has a high-speed Internet connection and has spent \$100 for a wireless transmitter, the only real cost associated with providing this service is the negligible amount of Internet bandwidth used by guests like me. Since most organizations pay flat fees for their bandwidth, there is no marginal increase associated with opening their networks to visitors. The same principle applies to campus phones that let anyone dial an off-campus toll-free number.

Of course, allowing strangers to tap into an organization's network does carry some security risks. Were a visitor to use his or her laptop to attack computers at the CIA or send out a million unsolicited e-mail messages, the university's largesse could quickly require an expensive and time-consuming investigation and cleanup. But the increase in risk associated with having an open network is minuscule and, ultimately, irrelevant. Telephones in lobbies are so useful that most companies are willing to live with the risk that someone could use them to commission drug deals or call in threats to the White House. With the Internet as large as it is today, trying to increase security by restricting physical access is a losing proposition. Besides, if bad guys are actually in your building, keeping them off your wireless network is probably the least of your worries.

Other organizations are experimenting with a cut-down version of IP tone that I call "Web tone"; basically, they provide a computer with a Web browser and a high-speed connection, but they don't let visitors plug in their own equipment. Amtrak, for example, offers Web tone in its Acela lounges in Boston, New York, Philadelphia and Washington, DC. "You can access any e-mail account—MSN, Yahoo!, whatever your flavor," says Michael Toczyłowski, Amtrak's manager of station technical support.

But the problem with Web tone is that it limits you to only those services that are available through the Web. While America Online, MSN and Yahoo! all offer Web-based e-mail, most corporations don't. Public Web browsers aren't particularly valuable to me because they don't allow me to

download my e-mail to my laptop and then read it later on the train. If Amtrak provided IP tone, I could.

What makes IP tone possible is a broad collection of standards. Because I'm writing about wireless networks, it's tempting to focus on 802.11(b)—the standard that makes it possible to network computers over the air. But far more important for the emergence of ubiquitous wireless connectivity are the standards that make the Internet plug-and-play. The most important of these standards is the Dynamic Host Configuration Protocol, which is what my laptop used to get a temporary "lease" on an Internet address, as well as the other information necessary to send data over the wire. For years the support for this protocol has been a largely dormant part of the Macintosh, Windows and Unix operating systems. Now it's actually being used, thanks to those little "home routers" that let people share a single high-speed Net



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connection among several computers in their households. As a result, when I was at a friend's house in San Jose, CA, a few months ago, all I had to do to get a high-speed connection for my laptop was plug it into the wall. Everything else was automatic.

With a \$50-per-month Internet connection and either a \$70 router or a \$150 wireless base station, any home or business can provide high-quality IP tone. The base station makes it possible for people to use this IP tone without stringing up any cables, which is nice—but it's the connectivity that's the important thing.

A growing number of hotels and other businesses catering to business travelers are trying to sell IP tone (Wayport and MobileStar are two of the better-known players in this industry). Most provide Ethernet jacks in the rooms; some provide wireless service. A friend of mine travels with his own wireless hub, so he can turn any hotel's Ethernet jack into a wireless service. To me that seems excessive, but he likes the freedom of being able to take his laptop anywhere in the room, or out on the balcony.

Ultimately, IP tone becomes valuable not when it is just in your hotel room but when you can count on it being everywhere. I have it in my house for guests. My friends have it in their offices. This is the friendly future that I see starting to shape up: instead of seeing Internet connectivity as a profit center, my guess is that businesses, universities and government facilities are going to provide IP tone to visitors for the same reason that they offer free local telephone service, water and the use of rest rooms—it makes the environment warmer, friendlier and more productive.

Do your part: set up an open network today. 