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One Person, One Phone

As Wi-Fi networks link with cellular networks, telephonic unity nears.



By Corie Lok
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The use of cell phones is likely to expand even further this spring when all U.S. residents gain the ability to transfer landline phone numbers to their mobiles.

A badge enables push-button Wi-Fi calls in settings like hospitals. (Photo courtesy of Vocera Communications)

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But there's a stumbling block in the path of the cell-phone juggernaut: poor reception inside many buildings that makes cellular networks not quite reliable enough to be the main phone systems for offices—or even for residents of many apartment buildings. So despite the rise of cellular service, most people still have traditional business and home phones.

In the next year, though, Wi-Fi—the popular wireless technology installed in many buildings that allows laptop users to surf the Net—will make mobile phone calls work virtually anywhere. An emerging crop of technologies will stitch Wi-Fi networks and existing cellular networks together, allowing calls to automatically switch between the two. The percentage of mobile phones that are Wi-Fi enabled will grow from near 0 percent last year to 85 percent by 2007, predicts On World, a San Diego, CA-based wireless-market research firm. “I’m very optimistic that within 10 years, most people will be carrying a single phone and making and receiving most of their personal and business calls on that one device,” says J. Gerry Purdy, an analyst with Mobiletrax, a Cupertino, CA, mobile- and wireless-research firm.

This trend could boost the use of the Internet to carry telephone calls, too. Internet



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calls have accelerated in recent years, as more people have gained access to faster connections, which improves service quality. Adding Wi-Fi to the mix means users no longer have to be sitting directly in front of their computers when they make calls.

And once cell phones can also understand Wi-Fi signals, callers can enjoy the best of both worlds—the cheapness of Internet calls and the flexibility of mobile phones.

Such dual-mode phones are on the horizon; Motorola of Schaumburg, IL, plans to start selling one such phone—cellular one minute, Wi-Fi the next—later this year. Once dual-mode phones and the merger of Wi-Fi and cellular take hold, you can make and receive all your calls on one phone no matter where you are. Forget about dead spots inside your office building: your calls will switch unnoticeably from your office Wi-Fi network to the cell towers lining the highway and finally to your in-home Wi-Fi network.

Indoor Wi-Fi coverage would be offered by cellular carriers as an added service. Subscribers would likely have to pay an extra \$5 to \$20 a month for it, says Ken Kolderup, vice president of marketing at Kineto Wireless in Milpitas, CA, but they'd get cheap Internet calls when they were on the Wi-Fi network. And by providing more reliable service indoors, the cellular carriers would be able to fully compete with traditional telephone companies.

Realizing this vision will require new hardware. Motorola, for instance, has partnered with Avaya, a Basking Ridge, NJ, voice- and data-networking company, and Proxim, a Sunnyvale, CA, wireless-equipment company, to develop telephone-networking hardware for office settings.

And Kineto has developed a network controller that can be installed on a cellular-telephone company's network to bridge cellular and Wi-Fi. If a cell-phone user is indoors and near a Wi-Fi access point, his or her phone would sense the stronger Wi-Fi signal and tell the controller that it should route any incoming calls through the Internet, and ultimately through the local access point. Three carriers in the United States and Europe are now testing Kineto's technology; Kineto expects dual-mode service to be available this year.

Meanwhile, a related trend is emerging: Wi-Fi communications systems that replace paging systems in workplaces like hospitals. For example, Vocera Communications of Cupertino, CA, installs a server that routes voice data over the workplace's internal computer network, to and from Wi-Fi access points in the ceilings. Workers have conversations via special badges that respond to voice commands. This is quicker and more convenient than pagers, and provides more reliable connections than cell phones.

All told, about 100,000 people in the United States are now making Wi-Fi phone calls at work. And that market is predicted to grow from \$16.5 million in 2002 to \$500 million by 2007, according to the Scottsdale, AZ, market research firm In-Stat/MDR. "This is only going to expand," predicts Purdy, who says the technology will soon branch out from hospitals and retail settings to business offices.

Of course, a number of significant hurdles remain. Wi-Fi sucks up a lot of power, so the new dual-mode phones will need to be very power efficient or have better batteries. Voice quality over the Internet—despite having improved in recent years—is still rougher than what’s available on traditional landlines. And putting too much voice traffic on Wi-Fi networks can slow them down.

Still, with more phone calls going over the Internet, more Wi-Fi networks being installed, and cell carriers looking to spread their coverage indoors, more and more people are likely to cut their telephone cords.

A Sampling of Wi-Fi Telephone Technology	
Avaya (Basking Ridge, NJ)	Internet-based telephone system switches calls between cellular and Wi-Fi
BridgePort Networks (Chicago, IL)	Software on cellular networks allows Wi-Fi devices to make phone calls
Kineto Wireless (Milpitas, CA)	Cellular-network controller allows cell-phone users to roam between home and business Wi-Fi networks
Motorola (Schaumburg, IL)	Dual-mode cellular and Wi-Fi mobile phone
OnRelay (Leatherhead, Surrey, England)	Software turns mobile phones into wireless extensions of office desk phones
Proxim (Sunnyvale, CA)	Next-generation Wi-Fi hardware enables more secure and higher-quality voice calls
Vocera Communications (Cupertino, CA)	Hands-free, voice-controlled system using wireless badges allows workers to communicate via Wi-Fi

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