

Friday, February 15, 2008

Mobile Carriers See Gold in Femtocells

If consumers buy in to private wireless phone networks, the industry could save money.

By John Borland

On its face, it sounds like a company's technological fantasy: a product sold to customers that will also save the business itself money.

That's roughly the attraction of a young wireless phone technology called [femtocells](#), which promise to give homes and businesses their own private wireless phone networks.

Similar in concept to the Wi-Fi routers that many people use to blanket their homes with wireless Internet access, these little boxes instead provide a network for carrying the voice and high-speed data services of mobile phones. They're designed to give bandwidth-hungry cell-phone subscribers the strongest possible connections at home. But by keeping those customers off the main mobile network and using home broadband connections to transfer data, they could wind up saving the phone companies money, too.

It's no wonder, then, that equipment vendors say that mobile phone companies are rushing into this market--with technology and even commercial trials beginning on both sides of the Atlantic--even before standards have been set or final technological hurdles cleared.

"Usually in the networking business, you build equipment, and then drum up demand," says Paul Callahan, vice president of business development for [Airvana](#), a femtocell equipment vendor. "This time, demand is already really strong."

The femtocell buzz is part of a broader, years-long push by mobile phone companies to persuade their customers to use cell phones instead of landlines for all their communications needs, and increasingly to use their cells for third-generation (3G) applications such as Web surfing, downloading music, and watching videos.

One hurdle, phone companies say, is that mobile phone coverage inside homes and businesses often isn't as good as it is outside. Some homes are in coverage shadows or have thick apartment walls that impede transmissions. In addition, the Wideband Code Division Multiple Access (W-CDMA) technology used for 3G services by [T-Mobile](#) and [AT&T](#) in the United States transmits at a higher frequency than does its predecessor, so it has a harder time penetrating walls.

A femtocell would relieve this problem--in theory. Instead of relying on the mobile phone's nearest cellular tower (known in the industry as a base station), which might also be serving scores of other callers at the same time, a customer would have her own private, high-quality cell-phone connection.

"Our goal is to get to a place where our services are available to all users at all times," says John Carvalho, head of core network innovation for [Telefónica O2 Europe](#), which announced femtocell trials this week.

Boosters of the technology paint femtocell as technology that benefits everyone. Customers get a fast, reliable broadband phone connection at home, and the mobile phone companies get to offload a small piece of their infrastructure investments to their customers.

In effect, every customer who buys and installs his own home femtocell would reduce the load on the carrier's local macro network. The femtocell itself serves as an alternative base station, broadcasting and receiving ordinary wireless signals from cell phones that the femtocell owner permits. This is a strikingly attractive idea, particularly to carriers in big cities that find their networks often overloaded, and find that local regulations or public opinion makes it difficult and costly to set up new antennas.

By using a femtocell, customers will send their voice and data traffic out their own DSL, cable, or fiber connection to the Internet, and then to the carrier's network. This will also reduce the load on the land-based data networks that carry voice and data traffic from the mobile phone companies' base stations to their own central switching facilities. That, in turn, could translate into less infrastructure investment.

Yet all of this will happen only if customers see enough benefit to buying themselves a femtocell--and for now, that's the biggest flaw in this rosy scenario, analysts say.

"What's in it for the user?" asks Keith Nissen, an analyst with the [In-Stat](#) research firm. "That's the big question. Right now, there isn't enough."

Broadband subscribers already have fast Internet surfing at home, by definition. Carriers may well offer cheaper cell-phone calls for femto customers using their home connection--but broadband subscribers can already do this using [Skype](#), [Vonage](#), or other voice over Internet protocol (VoIP) services. Strong cell signals at home are certainly a plus, but it's not clear how much consumers will pay for this, analysts say.

Without an obvious consumer must-have attraction, demand will likely be tied closely to price, Nissen says. If a femtocell is cheap enough, consumers will latch on to the idea, assuming (and this can be a big assumption) that carriers are able to explain and market it clearly. But this price may be a sticking point for some time.

Today, the equipment cost for femtocells runs in the range of \$250 to \$300. [Sprint](#), one of the first companies to start commercial trials of the products, is offering them to consumers in Denver and Indianapolis for \$50 apiece, along with an offer of lower-priced calling plans--altogether a substantial subsidy.

O2's Carvalho says that he expects equipment costs to come down to between 50 and 80 British pounds (about \$100 to \$160) once standards are set and mass-manufacturing begins. That's an acceptable price range for consumers used to buying products such as Wi-Fi modems, he says.

The standards process may take several years, however. Different equipment vendors use different techniques for aspects such as security, or for letting the femtocells talk to the carrier's core network. Femtocells have been developed for both rival 3G mobile phone standards--W-CDMA and CDMA2000--but different standards-setting bodies are separately at work on rules for each.

In the long term, analysts expect femtocells to be a fast-growing, successful market. In-Stat forecasts that 40.6 million femtocells will be distributed around the world by 2011. [ABI Research](#) is even more optimistic, projecting 70 million in use by 2012.

By that time or shortly afterward, analysts say, femtocell technology may be built into other devices, such as Internet routers for consumers.

[Vodafone](#), T-Mobile, and O2 all announced trials early this year. Equipment vendors say that many other carriers are in undisclosed trials as well. Commercial deployment, in which the products will be distributed to consumers by the phone companies or their retail partners beyond the limited scale of Sprint's two-city experiment, is expected by early next year.

That's all assuming that consumers react positively when they actually get a chance to see how the technology works.

"If it winds up being more expensive, but it provides better data rates, it's probably worth the investment for us," says O2's Carvalho. "If it's more expensive but slower, and it annoys customers, we probably wouldn't take that on."

Copyright Technology Review 2008.