

COMMUNICATIONS LAW UPDATE

February 9, 2005

WiMAX: Wireless's Last Mile

WiMAX is a new wireless technology that is being called "WiFi's big brother." The comparison is understandable. Like WiFi, WiMAX (short for "Worldwide Interoperability for Microwave Access") is an Institute of Electrical and Electronics Engineers (IEEE) standard designed to allow high-speed, wireless communication between a base station and fixed or moving terminals. Like WiFi, the new technology has spawned a consortium (the WiMAX Forum) of major industry players (including Intel, Nokia and AT&T) dedicated to ensuring the interoperability of WiMAX equipment. And as WiFi continues to do, WiMAX is widely expected to create a lucrative market for hardware manufacturers designing devices for both home and business users.

But there is a crucial difference between the two technologies. A single WiFi (IEEE 802.11) base station can support only what the IEEE calls a Local Area Network (LAN)—covering roughly the footprint of a single home or small business. A WiMAX base station, in contrast, can support what the IEEE calls a Metropolitan Area Network (MAN)—a radius of between five to 30 miles. So while WiFi serves mostly to increase the value of existing wireline broadband connections to homes, businesses, and schools, WiMAX has the potential to become a legitimately disruptive technology to existing wireline-based broadband modalities, competing

with last-mile and backhaul technologies such as DSL, T1, T3 and cable. As the FCC has recently observed, WiMAX technology "is expected to become a last mile solution for cable operators, broadband providers and others," and "is a crucial step towards a transition to IP communication entirely without wires."

To date, the IEEE has provided for two distinct flavors of WiMAX. The first (IEEE 802.16) is a standard in the 10-66 GHz range, suitable for so-called line-of-sight environments (meaning no physical obstructions between WiMAX stations). A typical use would be backhaul between a cellular tower on a downtown office building and a suburban tower attached to a fiber backbone network. The effective range of this technology is up to 30 miles or 75 Mbps, though as with all wireless technologies there is a tradeoff between throughput and distance.

The second standard (IEEE 802.16a) is in the 2-11 GHz range and is suitable for non-line-of-sight environments (meaning communication through walls and similar fixed objects) in a four to six mile radius of the base station. Obvious uses include providing T1-level broadband service to businesses (which may in turn maintain internal wired or WiFi local networks) or DSL-level broadband service to homeowners. More novel uses might include voice or video consumer devices that could take advantage of WiFi hotspots

wilmerhale.com

Baltimore

Beijing

Berlin

Boston

Brussels

London

Munich

New York

Northern Virginia

Oxford

Waltham

Washington

This letter is for general informational purposes only and does not represent our legal advice as to any particular set of facts, nor does this letter represent any undertaking to keep recipients advised as to all relevant legal developments.

Wilmer Cutler Pickering Hale and Dorr LLP is a Delaware limited liability partnership. Our UK offices are operated under a separate Delaware limited liability partnership.

© 2005 Wilmer Cutler Pickering Hale and Dorr LLP

when available or WiMAX frequencies in areas when lower power WiFi service is not available. At least one company, Towerstream, has already leased space on the Empire State Building to provide TI-level WiMAX service to Manhattan businesses at, according to the *New York Times*, one-third to one-half the price of comparable telco service.

Both variants of the WiMAX standard are designed for maximum technical flexibility. WiMAX base stations can prioritize the quality of service offered to terminals served by the station. A single WiMAX station can thus serve users seeking voice- or video-grade signals as well as data users willing to accept a lower quality signal in return for a lower price. The standard can also accommodate flexible channel bandwidths, permitting its deployment in countries or regions with varying available spectrum. And the technology supports advanced privacy and encryption features. It also will be able to support “smart radios”—devices that automatically seek out the best available radio frequencies, avoiding the interference that plagues current networks. While “smart radios” are still on the technological horizon, some believe that they will radically increase the efficiency of existing spectrum allocations.

The biggest champion of the technology so far is Intel, which was a major force in popularizing WiFi through the WiFi Alliance and its Centrino laptop chip. Intel has taken a similar leadership role in supporting the WiMAX Forum. The company began shipping beta versions of WiMAX-capable chips to equipment manufacturers in the third quarter of 2004 and expects consumer-ready WiMAX-capable notebooks and PDAs by 2006.

Both the WiMAX Forum and the European Telecommunications Standards Institute, the

entity addressing WiMAX issues in Europe, are currently working out the details of certifying a single worldwide WiMAX standard. The WiMAX Forum recently announced that certification testing, originally scheduled to begin in January of this year, would be delayed until July. It is unclear what impact that delay ultimately will have on the timetable for the availability of WiMAX technologies in the marketplace.

The most important remaining technical question is whether the WiMAX industry will employ licensed spectrum, unlicensed spectrum, or both. The WiFi standard has famously flourished on unlicensed spectrum, without insuperable interference problems. Along these lines, on May 14, 2004, the FCC announced proposed rules that would open the 3650-3700 MHz band to unlicensed use. One of the FCC's motivations was to “facilitate the development and deployment of systems. . . under the new adopted IEEE 802.16a (“WiMAX”) standard.” The FCC has yet to set aside any licensed spectrum specifically for WiMAX technologies.

But WiMAX's greater range, of course, raises interference problems that WiFi does not. And WiMAX's ability to compete with business and consumer wireline broadband services hinges on delivery of high-quality, uninterrupted communication. Thus, it is a distinct possibility that WiMAX providers will begin to acquire licenses for this purpose. For instance, in the fourth quarter of 2004, Intel invested an undisclosed amount in a company called Clearwire that intends to market WiMAX services. Started by Craig McCaw, Clearwire announced to the press in October of last year that it has already purchased spectrum in “quite a few markets.” The company has just begun to offer broadband service in limited regions.

COMMUNICATIONS LAW UPDATE

If you would like more information on this topic, please contact either of the following lawyers:

Jonathan J. Frankel

+1 (202) 663-6113

jonathan.frankel@wilmerhale.com

Jonathan H. Siegelbaum

+1 (202) 663-6559

jonathan.siegelbaum@wilmerhale.com