



United Business Media

Open-source Symbian builds foundation **11**

EE Times

THE NEWSWEEKLY
FOR THE
CREATORS OF
TECHNOLOGY

ISSUE 1547 MONDAY, OCTOBER 27, 2008 WWW.EETIMES.COM



wimax

ready, set, go!

26

Android: Secure
and downloadable

22

IMEC develops cell-level
brain implant chip

24

Extending mobile wireless demands conformance

Testing WiMAX, testing

By Nicolas Mokhoff

WiMAX HAS BECOME the poster child of the mobile Internet world—a world where anything and anybody can be connected from anywhere.

WiMAX stands for World Interoperability for Microwave Access. The first leg in the WiMAX race is to provide broadband wireless access to a range of computing devices by extending the reach of current Wi-Fi nodes. Wi-Fi typically operates over 300 feet, depending on how close the user is to a basestation, while WiMAX extends that range to some 30 miles. Of course, capacity and demand can be limiting factors.

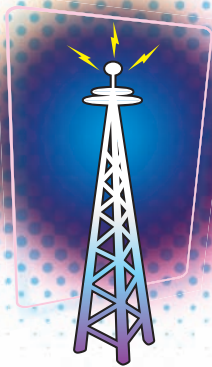
But WiMAX devices, terminals and basestations require rigorous testing and conformance to tight specification standards, more so than those required for Wi-Fi.

“The Wi-Fi Alliance has pretty much lost control of Wi-Fi,” said Craig Mathias, principal of Farpoint Group consultancy. “There are lots of uncertified products on the market and no one really seems to care anymore—as long as the chips and reference designs are interoperable.”

Mathias contends that such a state of affairs is unlikely in the WiMAX market, as carriers will insist on certified products. “They just don’t need the headache of trying to figure out why something is not working.”

At last count there were more than 400 WiMAX deployments in 133 countries, according to the WiMAX Forum, whose goal is to accelerate standards-based, interoperable solutions to the marketplace. The WiMAX Forum Certified program provides a sort of seal of approval for WiMAX products.

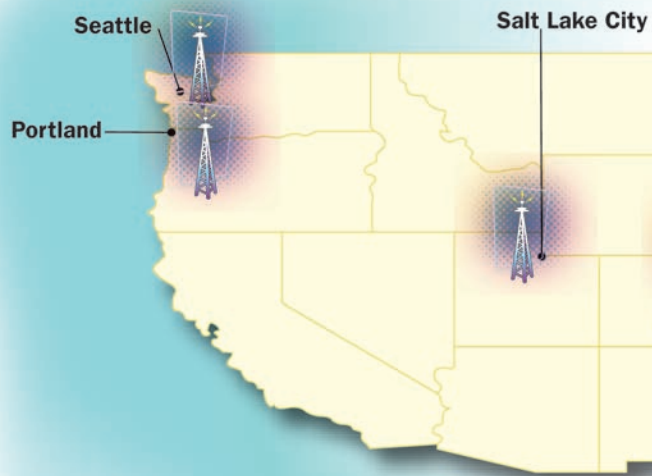
For WiMAX market participants there are many challenges. “Compared with Wi-Fi, or even Wi-Fi MIMO [multiple in/multiple out], WiMAX Wave 2 specifications [increasing functions to test with each Wave of the IEEE805.16 spec] require more stringent parameter control, including frequency stability, modulation quality and power control,” said John Lukez, head of product management at LitePoint, a leading WiMAX test vendor. “Because the standard anticipates much greater range than Wi-Fi, and operating in an environment with greater potential for interference, there is more concern about power spectral density and tighter EVM [error vector magnitude] performance to avoid interference while provid-



ing higher data throughput.”

While any testing solution must be accurate enough to ensure that WiMAX signals meet these more stringent specifications, “testing has to meet time and cost constraints that differ little from those of Wi-Fi,” Lukez said. “It’s a case, again, of having to do more—more accuracy, more complex testing—without taking significantly longer or costing significantly more.”

WiMAX Forum defines and conducts conformance and interoperability testing to ensure that different vendor systems work seamlessly with one another. Successful testing gives the tested device a “WiMAX Forum Certified” designation. “The Forum goes to great lengths to warn vendors that claims like ‘WiMAX-like’ and ‘WiMAX-compliant’ are not WiMAX Forum Certified, which means their equipment isn’t interoperable with other vendors’ equipment,” said Ron Resnick, president of WiMax Forum.



SOURCE: EE Times

WiMAX certification is crucial for the market to grow—without it, interoperability would be limited. “Interoperability is like any other standard,” said Edwin Lowery, principal consultant for Verigy’s Wireless Center of Expertise. “If everyone went [his or her] own way, you wouldn’t be able to use your Compaq computer with the Sprint network, or use your Sprint handset in Europe, etc. Compliance allows for interoperability. As an example, imagine if there were 10 different Bluetooth flavors. You could ‘buy a Bluetooth,’ but the device only works with this one compliant headset. What’s the point of a standard if it only works with one product?”

“There is really only one solution: Make sure WiMAX devices are tested in production in ways that ensure they truly meet the standard’s specifications,” said Rob Brownstein, LitePoint vice president, market relations and communications. “This sounds simplistic but it’s not. In development, one has some latitude with test time. In production, where pricing and margins can make or break a market, trading off testing comprehensiveness for time and cost is very tempting. The solution is not to give in to temptation.”

Verigy’s Lowery explained specific challenges of WiMAX testing: “WiMAX supports multiple modulation types and multiple modulation bandwidths. To effectively test WiMAX, you need a mechanism to easily and effectively create the multiple waveforms used to test the device under test—that has to be part of the test strategy.”

Lowery said that older 2G testers may not have the performance, phase noise and linearity required to test WiMAX to spec. The newer testers have the capability to perform the challenging EVM tests. “It is important to have good synchronization, good I/Q balance for your RF sources and I/Q balance between the AWGs [arbitrary waveform generators] and digitizers,” said Lowery.

What sort of problems might “WiMAX-like” or “WiMAX-compliant” products create?

According to Lowery, such devices present the same challenge as any high-integration embedded wireless interfaces, because WiMAX will be used openly in a conversational platform, either handsets or more likely PCs. “When I think of interference, I think you want to make sure you have a working WiMAX transceiver that doesn’t affect other electronics in the system. If it’s in a laptop, be very sure it’s not interfering with, or isn’t interfered [with] by, any radiated energy inside the laptop,” Lowery said. “EMC [electromagnetic compliance] is a big deal, and packaging and system designers in particular have to keep that in mind.” (See accompanying story page 28.)

Earlier this month, the WiMAX Forum announced 13 additional Mobile WiMAX devices have been designated as WiMAX Forum Certified.

“WiMAX devices and networks have the most extensive certification and interoperability testing in the industry in place to guarantee network performance and consumer satisfaction,” said WiMAX Forum’s Resnick during his keynote at WiMAX World 2008 in Chicago early this month.

Products are currently certified under Release 1.0, which is based on the IEEE 802.16e-2005 standard. The focus of certification during the initial stages of Release 1.0 is on radio and protocol conformance, and on interoperability testing. Toward the end of 2008, Release 1.0 is expected to include testing for baseline network services, based on the WiMAX Network specifications developed by the forum’s network working group.

Release 1.5, anticipated in 2009, is to be based on IEEE 802.16e Revision 2 and the corresponding updated version of the Mobile WiMAX System Profile. Release 2.0 (2010-11) is expected to be based on IEEE 802.16m. ■

