

THE **BROADBAND** **BATTLEFIELD:**

How WiMAX and HSPA
are fighting it out

By staff writer Karyn McGettigan





TWO OPPOSING CAMPS are fighting for dominance over the mobile broadband market. Each has formed its own strategy, with the 3G establishment on one side and the upstart WiMAX on the other. This conflict is not about technology: it is a business power game, and a lot is at stake. The offensive was launched more than two years ago, but the face of the war is constantly changing. Some combatants appear in both camps, adding confusion to an already-complicated picture. How is this battle being fought? And what can we expect to see when the dust finally settles?

Landscape of the conflict

Michael Thelander, CEO of Signals Research Group, says the issue may be more a question of propaganda than reality. He recognizes that there is a veritable struggle, with the WiMAX team presenting itself as the PC industry champion in the battle against the telecommunications industry. He says their claim is that wireless is stuck in a telecommunications rut and that, conversely, WiMAX is coming from an internet perspective, in terms of the business model and the players involved. He thinks it is more a business decision and has nothing to do with the technology.

Roger Entner, senior vice president for the communications sector with IAG Research, says that on one side there is the established 3G technology, whose proponents are predominantly Ericsson and Qualcomm. He says these two companies are strange bedfellows because they found each other on the battlefield while both concentrating on that technology. They are the true defenders

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of the HSPA faith. On the other side is Intel and the smaller chipset providers that are really pushing the WiMAX standard.

Peter Jarich, research director with Current Analysis, says the HSPA camp was the first to come out with high-speed upgrades to mobile phones, and it is now branching into areas such as consumer electronics and laptops. WiMAX, on the other hand, started with a focus on fixed wireless access and is therefore coming from a different direction.

Although WiMAX products are being shipped, the certification process for Mobile WiMAX has not been started yet. "WiMAX is not very mature," Jarich says. "The deployments for Mobile WiMAX are really more about trials. It's not really a fair battle, but people always want to look ahead. They love the promise. They want to be able to look to the next big thing, and this is the attractive part."

But Entner sees a problem with putting the cart before the horse: "The standard has still yet to be defined. Regardless of the rhetoric and hype, WiMAX is more than three years old and the official standard is still overdue. The landscape of the war shows that both camps are fractured, but WiMAX is the more fractured of the two. On the WiMAX side, you have multi-billion-dollar companies trying to sell a standard that they cannot agree upon."

Veritable tug-of-war

Entner sees many providers as the arms merchants of the battle, providing systems for both camps. He says they will provide whatever is wanted, and names Motorola, Samsung, and Nokia Siemens Networks as companies that are presenting systems for both WiMAX and HSPA. "To a large degree, you have only a few that are supporting only one technology," he says.

Thelander says US operator Sprint turned to WiMAX because of that camp's sense of urgency. Sprint was forced to put its spectrum to use before LTE (the 3G step following HSPA Evolved) would be ready, and then received a lot of concessions from its vendors. Thelander acknowledges that operators have to act in their own self-interests. "If you get those types of concessions, then why not? You do what's best for you, but if nobody else follows suit, then

you're kind of on an island by yourself. That's why Sprint has the option now to go back to LTE, if things don't work out." He sees many camps on the battlefield – from operators to consumers – and compares the broadband battle to a tug-of-war: "The operators are in the middle with WiMAX tugging on one side and 3G tugging on the other."

Thelander says that, traditionally, the players that are the most involved in WiMAX are those who have struggled in the traditional cellular path. "If you are an infrastructure supplier, to some extent you're an arms dealer. And you don't care what technology it is as long as you're involved in the contracts and deploying the infrastructure. There are many players that are in both camps: in terms of the suppliers, it includes everyone but Ericsson and Qualcomm. There are other players, but all the major infrastructure suppliers with the exception of Ericsson are involved to varying degrees.

"This explains how a lot of companies cross over and support WiMAX as well as 3G. Some of them question how big the market is going to be and whether it's a worthwhile investment, but they are still somewhat involved."

Thelander lists Intel, Motorola, Samsung, Nortel, Alcatel-Lucent, Huawei, ZTE and Nokia Siemens Networks as major vendors driving WiMAX.

Entner agrees that most companies do support both WiMAX and 3G and that, with the exception of Ericsson and Qualcomm, there are very few companies that do not. He also notes Samsung's name on the list, but says it is not really a competitive threat. "Samsung is never going to win a contract over Ericsson for 3G, so the only way Samsung can compete on a global scale is with WiMAX."

Entner says, however, that the true WiMAX warrior – and the biggest beneficiary – is Intel. WiMAX provides another way for Intel to differentiate its processor family for laptops and chipsets. "It's very interesting how Intel has become a player in this field," he says. "Intel wanted to compete better with AMD. And the first answer was Wi-Fi. The next logical step is to go from a wireless local area to a wireless wide-area technology – and that is WiMAX."

Thelander points out that some of the allies on the WiMAX side are pro-3G but may not be vocal about saying so. He thinks Intel is a company that would actually like to see 3G succeed. One can only speculate whether Intel is committed to WiMAX or married to its processors. Intel aims to sell its new micro-processor architecture into devices with open systems, and WiMAX is one way to do this. Another way is with HSPA, and Intel has programs involved in both technologies. Thelander says: "I think Intel recognizes that WiMAX faces a different situation in Europe because 3G is so entrenched there. Intel is somewhat pragmatic: it recognizes there are certain markets where it is just not going to compete."



The WiMAX camp has a lot of start-ups; with new technology and new money, new companies are getting into the WiMAX space, especially on the silicon side. Thelander says this is consistent with what happened with earlier technologies such as Wi-Fi and Bluetooth. "All these new companies come in and try to be the next Texas Instruments or the next Intel, but they do it with new technology," he says. "There is no way that a new start-up is going to be successful with 3G because the dominance has already been established. So the best way to do that is with a new technology, and they are trying to do it with WiMAX."

War with many fronts

All three analysts agree about where the camps are physically located. If one were to define 3G as HSPA and its evolution, then historically it is a European camp that has now gone worldwide. WiMAX is the Americas and Asia-Pacific. The three acknowledge that most of the companies are US-based, but there is much happening in Asia, for example with Samsung and a lot of its initial deployments taking place there.

The battle is unfolding on different fronts, Thelander says. "In Europe, it's a spectrum battle: the WiMAX community trying to gain access to spectrum for their technology versus the 3G camp, including the operators who are basically saying 'We don't want WiMAX here.' It's a battle in the press, in terms of who's got the

...The broadband battlefield

fastest and cheapest, and who's got the most players involved." He says there are struggles with regulators throughout the world, citing India and other Asian markets, as companies try to convince them to endorse WiMAX for certain spectrum.

Weapons of war

WiMAX uses the IPR (intellectual property rights) argument as one of its main weapons. "They are saying that 3G has very expensive IPR," Thelander says. "With WiMAX, the patents are widely dispersed so that, at the end of the day, WiMAX licensing could be much cheaper. The WiMAX people are also looking at Mobile WiMAX being launched commercially in North America sometime in 2008. So that's going to be anywhere from a year-and-a-half to three years before you see something comparable on the 3G side. They've got that time-to-market advantage going for them."

The device "ecosystem" is also being used as a weapon. Thelander finds it interesting how Intel, Motorola, and Samsung claimed they would get 50 million WiMAX-embedded, consumer-electronic devices onto the market over the next three years. "Sprint is always saying that they are creating this massive ecosystem where the operator is no longer responsible for selling handsets; they're responsible for selling services."

In the traditional telecom model, he says, a user walked into an operator's store and bought a subsidized handset that had gone through months of expensive tests. "The Mobile WiMAX model is that the ecosystems are coming up overnight. You're going to walk into a consumer electronics store and buy a computer, or a camera, or a navigation system of some sort, and WiMAX just happens to be inside it. Now you've got WiMAX in the hands of consumers and all they have to do is activate it."

Thelander believes this is a model that is being created and driven by companies such as Intel, so it is not inherently part of the WiMAX standard. But, he says, it is something that they feel forced to do to create an ecosystem comparable to 3G. "I don't think it's an advantage, per se, but to convince someone like Sony to embed WiMAX in a camera, they're not going to do it for free. Somebody has to be shoving money under the table somewhere, convincing them that it's in their best interest to do so. So it's not necessarily a technology advantage, but something that Mobile WiMAX is doing, a weapon that they are using."

The analysts all agree that the weapons the 3G camp is using include scale, size, the number of operators, devices, and subscribers. Thelander says: "There are probably 150-160 million 3G subscribers today. To see numbers like that with WiMAX is just not foreseeable. In terms of deployment, a mobile operator in Europe deploys 3G

and it's nationwide – it's literally thousands of base stations." Citing a recent press release out of Australia that stated the WiMAX community had just shipped its first six base stations, Thelander says: "I wouldn't even begin to brag about six base stations."

It comes as no surprise that WiMAX's main attack strategy has primarily been via the press. All the analysts agreed that WiMAX has been quite successful in using the media as a tool. Jarich says: "The media has been out there in the WiMAX world. People want something new and HSPA is an established technology. Intel has pumped a lot of money into WiMAX, but when you oversell a new technology, a backlash is bound to happen."

Entner takes this one step further by saying that the HSPA camp is predominantly using its existing deployment as its main weapon. "HSPA is actually deploying the technology in the field, but is not effectively using the press or the imagination of the populace to capture its benefits. What WiMAX has been incredibly successful in doing is promising Nirvana."

Jarich is convinced that newer WiMAX has the most advanced technologies. He thinks it is the more cutting-edge of the technologies, yet acknowledges that HSPA is not just sitting around resting on its laurels. "There is a much larger set of users out there and HSPA definitely has that advantage. There's always more to the story. WiMAX is overselling itself to some extent without really saying what the time frame is. It's so new that we're all making our best guesses. In retaliation, HSPA is really selling hard what's coming forward."

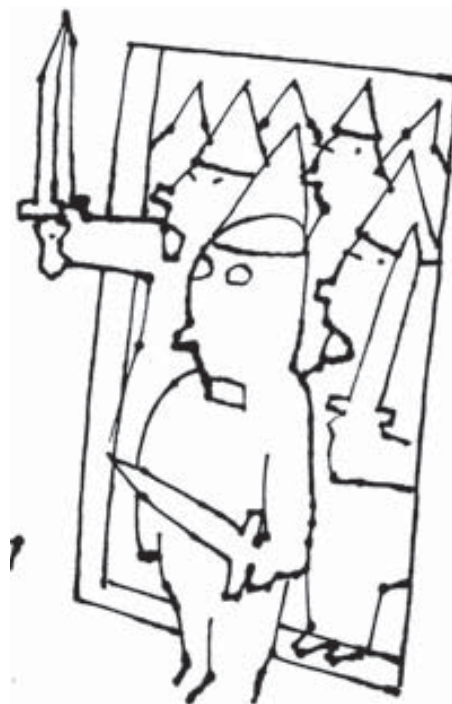
Strengths and weaknesses of each side

Thelander says the WiMAX camp definitely has the time-to-market advantage when it comes to OFDMA (orthogonal frequency division multiple access), the next capacity-raising radio technology. But for most operators, he says, the technology is here before the market is ready for it. "I don't know that consumers need or want to have broadband connectivity to the extent that they need it

everywhere at even higher speeds," he says. "3G can more than handle the traffic load for the next few years. The biggest downside with 3G is not the data rates; it's how many subscribers you can support simultaneously. That's where 3G has its limits."

Here, Thelander refers to 3G specifications for products already on the market today, where operators prioritized higher bit speeds instead of the number of users. However, 3G evolution plans take new usage patterns into account and the focus is on developing support for a greater number of simultaneous users.

He believes that, for operators, the fear lies in the possibility that broadband demand will become so great that OFDMA is needed earlier. How-



ever, he thinks this possibility is still a few years away. "Giving operators WiMAX today is basically giving them capacity that they have no need for," he says. "It's like building an eight-lane highway when all you really need is two lanes."

Thelander sees the main benefits of 3G as size and scale. As the technology continues to evolve, operators are reusing a lot of existing network resources. The upgrade costs are modest compared with deploying a brand-new radio access network. On the quality of HSPA Evolved, he says: "Performance-wise, it's pretty compelling. Some people may say that WiMAX has an advantage over 3G and LTE, but that comes with a cost. And that cost is substantial compared with doing a fairly simple upgrade for what you already have in place."

In the end, Entner says we all like to live in a state of hope: "Consumers are agnostic as to what technology they're using," he says. "If it worked on smoke signals and bush drums, they would use it. So all this agitation about which one is the right way to go is completely irrelevant to any consumer."

Truth as the first casualty

All three analysts say there was nothing honest about this war. Citing the early days of 3G, Thelander says: "There were all these promises of 2Mbps data rates. I have yet to see 2Mbps on a 3G network. Now it's taken the next technology to deliver on what the first technology promised."

He says that, with WiMAX, promoting that there will be something to offer in 18 months is just not practical. "It was so misleading, they're not being honest."

Entner agrees: "There have been studies released from the WiMAX camp that compare apples with oranges: Mobile WiMAX with single-antenna HSPA. Of course the single antenna will be slaughtered by MIMO (multiple antennas) WiMAX. This is absolutely not an honest war. They use statistics like a blind man uses a lamppost, for support rather than illumination."

Boxing ring

If the fight were moved from the battlefield to the boxing ring, would the analysts willing to say in which corner they would stand?

Thelander has no problem saying where he would put his money. "If I were a betting man, I would probably put my money on HSPA. It's guaranteed. The market today is already far bigger than I think WiMAX will ever become. If you're a small company and you have some sort of technology niche, you may do extremely well on WiMAX. But if you're talking about which market is going to be around forever, it's clearly HSPA."

Jarich is a little more circumspect: "It would also depend on how many rounds there are in the match. In the near term, I'd put my money on HSPA because of its momentum, its networks, its devices. If it's a longer match, maybe WiMAX has a chance. Will it prevail? Probably not."

Entner sees the victory going to a third technology: "The first 10 rounds would go to HSPA. The rest of the fight will be based on OFDM: either a successor of 802.16 or LTE. The ultimate winner of the war will be a third technology."

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Will there be peace?

Jarich says the battle rages on and that, for the consumer, the real conflict has yet to break out. "It will probably be a couple of years before we see the real battle for users," he says.

Thelander, on the other hand, believes the war has already peaked. "Sprint has thought logically about execution – because when you are fighting for legitimacy in the world and for a big operator, you've got to deliver." He thinks there will still be rhetoric and a battle for spectrum in certain markets, but he does not envision conflicts erupting like they did before. "I think the big battles have been fought now," he says.

Entner thinks there is enough money to go around: "As we've seen with GSM and CDMA, the supposed loser was Qualcomm, yet look at all the millionaires that have come out of Qualcomm and its strong position with HSPA. The supposed loser, CDMA, is the foundation of the supposed winning technology."

Entner believes that each side is pushing the other to greater excellence. "They are like two runners in a marathon, neck and neck, pushing each other faster and faster. If you would have only one running, the speed would not be as great as with the competition at your side. This is a positive thing. Nobody will die in this war. Egos may be bruised, and that's about it. In the end, life as we know it goes on."

Sprint's boardroom battle

THE RESIGNATION of Sprint's chairman and CEO Gary Forsee happened after the completion of these interviews.

He was a driving force behind the acquisition of Nextel, but the company has struggled after the merger, and steadily lost ground to competitors. Adding to that, Forsee "hung the company's future on WiMAX, and his departure raises questions about the company's commitment to the technology," comments *The New York Times*.

The WiMAX effort was seen by many observers as a bold move beyond the cellular voice business, but also a risky gamble on unproven technology. Though Sprint has reiterated its commitment to WiMAX several times in the last few months, Forsee's departure "leaves the fate of the WiMAX venture uncertain," according to *Information Week*.