

Motorola Puts Full Weight Behind WiMAX as a Step to Mobile Broadband and 4G

by Caroline Gabriel, Research Director, Rethink Research Associates

The 802.16 standard on which WiMAX is based may have started life firmly focused on fixed wireless applications, but it has evolved to become increasingly mobile in the past two years, to the point that a group of powerful players are determined to take the newly finalized specification, 802.16e, and make it the central technology for mobile broadband in the second half of this decade. Most of the support for the first fixed wireless variant of the 802.16 platform, 802.16-2004, comes from specialist vendors. But 802.16e has developed, particularly with the incorporation of the Korean Wi-Bro technology, to support full, high speed mobility, all-IP systems and, in future, fourth generation data rates. As such, it has attracted the attention of the largest players, especially those who are focusing their growth plans on convergence and all-IP networks. One of the most committed to the WiMAX cause is Motorola.

In July, Motorola announced its MOTOwi4 (for fourth generation) product line and roadmap, and in so doing, set out one of the most aggressive game plans for WiMAX in the industry. The company will skip support for 802.16-2004 and certify MOTOwi4 immediately against the mobile standard. The initial products are due in the second quarter 2006 and the company hopes certification and interoperability testing for 802.16e will already be available by then, although if there are delays, it will ship MOTOwi4 in a pre-certified form. The kit will provide carrier-class mobile broadband systems in licensed spectrum (2.5GHz and 3.5GHz) and will form part of an end-to-end solution. Motorola will also support a 'no customer left behind' policy for its existing broadband wireless range, Canopy™, although there will be no direct upgrade to WiMAX, since Canopy™ is a fixed wireless offering for unlicensed spectrum ISPs. In the longer term, MOTOwi4 also provides a broader roadmap towards true 4G technologies based on key elements such as OFDM and smart antennas. The new initiative involves increased R&D, resources and technology relationships, in addition to product plans.

The MOTOwi4 announcement indicates the importance of WiMAX to Motorola's increasingly coherent strategy based around integrating multiple mobile technologies. Clearly, Motorola seeks to gain dominance of the WiMAX agenda through early action – a strategy confirmed by its recent selection to carry out trials of MOTOwi4 with Sprint Nextel, which will build a national US broadband wireless network in 2006-8.

Motorola has already demonstrated, with the aggressive pricing of its Canopy™ product line, its ability to use its scale to drive down prices in the market and shift the whole sector closer to the important goal of a low cost, even a zero-subsidy, customer device. This is good news for mobile WiMAX efforts as a whole, which must make rapid progress in order to fend off challenges from other broadband wireless technologies that could also appeal to carriers.

“Motorola has aligned its Networks business to support the company-wide initiative to develop WiMAX and other mobile broadband wireless solutions that provide an effective means for carriers to give their customers broadband services when and where they want them at an affordable cost,” said Dan Coombes, general manager of Wireless Broadband Networks, and chief technology officer for Motorola Networks. “Motorola is well on the way to delivering WiMAX solutions.”

The MOTOwi4 portfolio initially includes a ‘light infrastructure’ solution for rural areas and developing countries that offers very low cost of deployment and ownership, and a carrier class platform. The latter incorporates the CAP architecture, which uses all-IP access technology to put intelligence into the base station itself, eliminating several hardware elements from the radio access network, thereby reducing operational costs.

Although the ‘light’ version will generate revenue in some of the most immediate markets for WiMAX, such as underserved access, the real potential lies in mass consumer mobility and converged applications such as voice and video over IP. As such, Motorola is positioning WiMAX as a true alternative to 3G and to the 3.5G technologies like HSDPA and CDMA EV-DO Rev A. WiMAX is the best supported mobile broadband technology for operators that do not have a 3G license, giving fixed line, start-up or large ISP players a chance to offer full mobility. It may even be adopted by some cellular carriers as a means to deliver premium services alongside 3G, or to cover rural regions more cost effectively, argues Motorola.

Coombes goes a step further and sees WiMAX, in some situations, as a direct alternative to 3G, not just a complement. In areas of the world where 3G has not yet been licensed or planned, such as parts of Latin America, there is the opportunity “to bypass 3G and to go straight to a system that is closer to 4G”, he said in an interview with WiMAX Trends. And even in areas where 3G exists, WiMAX will offer advantages, notably because it is closer to 4G-type functions such as the all-IP core and integration with the IP Multimedia Subsystem, and peer-to-peer signaling. All these functions are supported in the base architecture rather than being added to an existing architecture founded on a different set of concepts, and therefore, Coombes believes, the path to true fourth generation systems will be a smoother and quicker one and that Motorola can take a leading role. Motorola is working on an end-to-end system from core to access, which will also offer roaming with other wireline and wireless networks, through its ‘seamless mobility’ initiative.

Roaming and integration with other types of networks will be vital to the success of any given technology in the all-IP, multi-network world, especially for a newcomer to the game. WiMAX/3G dual-mode handsets should be testing by 2007, believes Coombes, and will be important. Indeed, handsets in general remain a key success factor for mobile WiMAX, and one of the least clearly defined areas so far. “We need cost effective integrated circuits for the handset if WiMAX is to do better than the 3G alternatives, otherwise it will not make it in the world of HSDPA and CDMA EV-DO Rev A,” he warned.

In the shorter term, the immediate impact of mobile WiMAX will be felt in the laptop and PDA, where initial chips will be targeted. Here - building on the success of Wi-Fi and user demand for portable, flat rate broadband access - will come WiMAX' first chance for real volume and the low costs that will bring. "The chip manufacturers in charge of the PC roadmap will implement 802.16e in the laptop with Wi-Fi chips and that is where the volume will be, and how prices will be driven down," Coombes pointed out.

All this leaves a much smaller market opportunity for the vendors and operators that have put significant resources into the fixed WiMAX standard, in Motorola's view. Since there is no interoperability between 802.16-2004 and 802.16e equipment, users of the former must either replace their base stations and subscriber units, or remain confined to a fixed-only world, where most of the product development is likely to be in the 5GHz unlicensed band (where mobility and 802.16e will not be practical). There will be applications for such systems, notably in rural and emerging markets, but not sufficient to support mass volumes and, therefore, very low costs.

All these factors, Coombes thinks, will leave the 802.16-2004 standard (formerly know as 802.16d) in the cold. "The 'd' market will die. Everyone was thinking that 'e' would be very delayed, maybe to 2007, but the standards have moved quickly," he argues. "802.16e does everything that 'd' does but it supports wider bandwidth, and offers less cost per bit, greater efficiency and throughput, and it will have smart antennas to improve link margin and inbuilding penetration. Don't clog up the spectrum with 'd' applications that cannot go to mobility where the real volume is," Coombes warns.

This line of thinking explains why Motorola, and most of the large telecoms equipment vendors, are putting all their efforts into 802.16e. For the first time, there is the chance to create a truly mobile broadband platform that is not tied to a 3G license or an existing investment in GSM or CDMA, and so is open to a wider range of operators. This could not only change the telecoms landscape in developed telecoms markets, but also opens the opportunity for developing economies to move swiftly towards fourth generation systems and even leapfrog their neighbors. And WiMAX should certainly be a factor in accelerating the inevitable shift towards all-IP, converged, multimedia networks on which all carriers, new and old, will be basing their plans for the coming decade. Motorola hopes that by seizing the initiative at an early stage, it will be in pole position to take advantage of that seachange.



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