Pathfinder Projects

WiMax Report

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With investors' hearts broken and mobile companies' balance sheets providing grim reading, has 3G been in vain? Worldwide Interoperability for Microwave Access (WiMax) is the commercial acronym for the IEEE 802.16 standards. These define a fixed specification 802.16-2004 and a mobile version 802.16e which are akin to Wi-Fi, but with improvements that provide enhanced performance over greater distances. Unfortunately for 3G, WiMax is, at last, steadily making good progress into its territory.

Wireless technologies are integrating themselves more and more into our everyday lifestyles through the widespread adoption of Wi-Fi. Whether it is at home, in the office, at an Internet cafe or a coffee shop, on the train or at the airport Wi-Fi is providing the user with a portable workspace and instant communication with clients and colleagues. Starbucks coffee shop and rail companies GNER and Virgin Trains are recognised businesses who are ensuring we can work on the move and communicate with colleagues in our portable office.

This should provide the ideal marketing opportunity for Wi-Fi's big brother WiMax therefore to make its appearance. Whereas Wi-Fi provides us with the freedom to roam inside and outside without a wired connection, but within a limited range, WiMax's potential is in providing long distance wireless communication and its significant commercial use is in allowing the means for a wireless broadband service minus the physical cables and wires.

A WiMax station has a theoretical range of up to 31 miles with a throughput of 70Mbit/s for users without a direct line of sight signal. Real-world tests by AT & T indicate that realistic values are more likely to be a range of 3 to 5 miles and shared data rates of 2 Mbit/s. These values should ensure 3G need not feel so threatened by WiMax that it cannot compete with it.

WiMax and Wi-Fi are interoperable and have the potential to provide a wireless network on a widespread scale. That is, a WiMax base station can communicate with many Wi-Fi access points and several strategically placed base stations will quickly encompass a significant area providing a giant hotspot allowing data to be transferred to and from the network and the user.

WiMax is already being designed to be incorporated into future laptops as a natural successor to Wi-Fi. Intel have announced that they will implement WiMax through built-in chips in all their Centrino laptops by 2008.

This leads to the concept of rather than an office building having multiple wireless access points with their optimal location researched and strategically assigned to provide a seamless Wi-Fi network for roaming users, a single WiMax base station could be put in position outside the building and its radius would ensure all users inside the building would have continued access regardless of their position. This should ensure dead spots associated with Wi-Fi are removed due to the breadth of the base station signal.

A single WiMax base station would of course cover a greater area than an office building and its placement can be such that it is able to encompass the greatest area of users possible on wider scale. In the UK a base station could be installed at a secondary school and this would feed all nearby primary schools and the local community of residential and business users. Other likely locations that could be considered are churches, council

offices, post offices or public libraries which all represent the focal point of a local community.

As WiMax becomes recognised and accepted as a broadband technology, service providers will therefore seek to offer Internet services such as Instant Messaging and VoIP. This, in turn, will alarm current operators providing mobile services over established technologies. WiMax is in competition with 3G and 3.5G technologies and is raising concerns for the mobile phone providers such as Vodafone. Mobile phones are also likely with WiMax chips inside.

The takeover of Flarion, which specialises in a rival, but similar technology to WiMax and therefore the obtaining of patent portfolios by Qualcomm seemed to concede 3G's potential inadequacies. In turn, WiMax avoids expensive royalty payments to Qualcomm, which owns most of 3G's intellectual property.

The first WiMax products have been certified with four vendors Aperto Networks, Redline Communications, Sequans and Wavesat now supplying approved hardware available for purchase. Intriguingly, there are compatibility issues over the two WiMax standards due to the desire to ensure 802.16e is interoperable with the technology developed in Korea called WiBro, but these are to be addressed.

Pipex Communications is one of only two UK companies with national licences for fixed wireless broadband and are presently testing broadband over WiMax in commercial trials in Stratford-upon-Avon with the intention of providing a national service in early 2007. Later in the year it will assess TV over wireless broadband. The other official UK licence holder is Pacific Century Cyber Works (PCCW), a Hong Kong-based company which operates in the UK. Further companies such as BT hold "light licences" allowing them to assess WiMax through unlicensed means which does not provide the same consistency of service and is at risk from potential interference. Ofcom are likely to auction further licenses in 2007.

Regional network operator Telabria has conducted extensive tests in Kent to assess the potential of WiMax which is believed to be strong and should allow them to expand their trials steadily across the country. Subscriptions are likely to be able to compete with established operators such as BT and NTL.

For residential users a 1.5MB ADSL service costs £24 a month with no limit on how much data can be downloaded. For a cheaper price, restrictions are imposed of one or two gigabytes worth of data only that can be downloaded. A 1.5MB SDSL service will cost subscribers £50 a month which is considered to be 75% cheaper than the equivalent BT service. Indeed, so concerned are BT that there is speculation that they are bidding to takeover Pipex Communications for a price of around £350 million. If this occurred then it is realistic that the UK would eventually receive the blanket WiMax treatment.

Currently, BT are planning to provide ten UK cities with blanket Wi-Fi access this year following successful pilot schemes in Cardiff and Glasgow. If the scheme in the ten cities continues the success of the pilot scheme then it will inevitably lead onto the blanket coverage of the entire UK. In the pilot scheme transmitters were placed on the sides of buildings and on the tops of phone boxes with around fifty transmitters being required to cover Cardiff.

In reality, building a ubiquitous WiMax network would prove far more expensive than buying wholesale access to 3G with a virtual operator agreement. WiMax's main potential

would be in providing giant hotspots which implies a co-existence of WiMax and 3G is plausible. Indeed, Nokia are developing dual mode handsets allowing the switching between networks. Thus, on one hand, mobile operators are able to swear their allegiance to 3G whilst, on the other, they remain open and negotiable to inroads made by other technologies.

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