**Connecting with WiMAX around the world**

*by Andy McKinnon, Motorola Home and Networks Mobility, and Chairman, GDC Ecosystem Partner Subcommittee, Wireless Communications Association International (WCA)*

WiMAX is predicted to have much success over the next few years, providing wireless broadband connectivity to people in far reaching places and with speeds at prices not possible with today's cellular technologies. Vendors, operators, silicon providers, content providers, and a whole ecosystem of companies are working towards building the networks and devices to make access to the Internet, data applications and next generation voice services more affordable.

But beyond that, there's another piece of the equation to the success of this new technology that is often overlooked.

And, it's something that can speed or slow the widespread adoption of WiMAX. So what is this missing link to bringing WiMAX to people around the world? Global roaming.

Global roaming often is not taken into consideration when operators run their business models for a WiMAX network, according to Andy McKinnon, WiMAX principal, Motorola's Home and Networks Mobility, and chair of the vendor sub-committee of the Global Development Committee of the International Wireless Communications Association (WCA). Companies are not calculating the "missing ARPU" that could be derived from roaming users entering their licensed area. That, he says, is a huge element in the business model that can make a huge difference in return on investment.

In today's world, ready, easy and affordable access to broadband is necessary to sustain commerce, enable economic growth and connect people to the information and entertainment they want - whether they are at home or abroad. This potential demand from travelers for WiMAX access represents an untapped opportunity for operators that can be met in the future through global roaming agreements and multimode devices.

Business travelers aren't just going to the world's largest cities. For example, Holland was the world's most frequently visited country in 2006 for business, according to a study by *USA Today* and some major travel guides. Incidentally, it was followed by countries one may not think of to fall into that category: Turkey, Brazil, Scotland, and India. So what happens to travelers today when they try to connect to the Internet when arriving in a foreign country, and how could WiMAX global roaming change their experience in the future?

One place to start will be with the mobile device. The mobile devices of today may be dual mode, but what are the modes of the future? The next leap in this technology pervasive world is to combine WiFi + WiMAX + GSM or CDMA. Want to be on WiFi network and still have voice? British Telecom (BT), through its wireless cities initiative and Fusion service, makes that possible today. And, although unlicensed spectrum like WiFi traditionally would not be used for voice, there are core technologies and designs like those now being employed by BT on its Fusion service, which can ensure that QoS does not degrade to the point of dropping the call.

So what will it take to make global roaming a reality for WiMAX and who is going to make it happen? Roaming is a huge subject that needs to be addressed not only by regulators, but by vendors and operators working together. There are technical, political, and business considerations in the mix.

Harmonization of the many spectrums in differing blocks and sizes is one of the key factors in making global roaming possible. There are many entities, including government regulators and wireless spectrum owners, that could work with the WiMAX Forum™'s Global Roaming Group to have leading roles in making WiMAX global roaming happen.

The majority of countries have designated 3.5GHz for fixed, nomadic and portable service, while the 2.5GHz and 2.3GHz bands are mostly allocated for mobile service. However, Worldmax in The Netherlands, the second most heavily broadband penetrated country in the world with fiber everywhere,

chose a mobile WiMAX solution to provide “broadband on the go” in its 3.5GHz spectrum instead of trying to compete with the pervasive fixed broadband.

Harmonization seems easy if you’re just talking about the radios going from one country to another. The technical challenges, though complex, can be solved. A global view of harmonized spectrum will assist this along with the appropriate use of technologies. For example, you may want to hold a call in the home on WiFi, wander outside the home to a WiMAX network, get in the car to handoff to Bluetooth, and then roam into GSM service. This has to be “seamless” or uninterrupted to appeal to consumers, but must allow for new tarrifing to make it attractive to operators.

For it’s the financial appeal of additional revenues that’s going to spur interest in WiMAX global roaming among operators. And it’s the vendor community that can play an important role in facilitating these global roaming agreements. Vendors can bring their customers together, connecting operators with one another and solving technical issues so they can provide continuous connectivity for people worldwide. Global vendors, those with end-to-end product and services solutions -- including core networking that can provide network authentication, billing and QoS -- can be especially helpful in advancing the adoption of WiMAX global roaming.

While global roaming still is down the road, WiMAX is bringing broadband access to people around the world. It’s meeting the needs of many different operators from greenfield installations providing broadband in countries where there was none, to developed nations where operators are augmenting their telecommunications services, to those competing with cable operators or forging ahead by offering mobility. Global roaming agreements will further extend the reach of WiMAX coverage and bring the convenience of hometown connectivity to travelers wherever they may go.



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