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Figuring out the 3G and 4G mobile broadband market is tough, but providing nomadic employees with fast connectivity makes the effort worthwhile

Global Mobile

By Peter Rysavy

IT CAN FINALLY PROVIDE RELIABLE mobile broadband coverage for employees who spend a lot of time on the move, thanks to 3G wireless networks available on a global basis. But don't get too comfortable—now the buzz is all 4G all the time.

As we discuss at greater length in our Analytics Report, for sale at *informationweek.com/1185/analytic_4g.htm*, market dynamics are shifting as new entrants, including Google, begin to support open standards and launch ambitious plans to participate in the wireless market. Carriers around the world are announcing support for WiMax, and there's mounting vendor anticipation that mobile broadband will be a source of huge new revenue from a variety of applications, both consumer and business oriented.

Before you sign on with any carrier, however, arm yourself with some facts. First, there's no official agreement on 4G technical requirements, so no wireless technology can today claim to be 4G.

Rather, the industry refers to "4G platforms" based on their ability to adapt to meet expected 4G requirements—namely, extremely high throughput rates of up to 1 Gbps peak in very wide radio channels of up to 100 MHz.

As for where to expect 2G vs. 3G globally, most developed countries now have 3G networks in place, with UMTS enjoying a wide lead over EV-DO. UMTS is common throughout the Americas, Europe, and Asia, while EV-DO is also available in the Americas and Asia, as well as Eastern Europe. In countries with high population densities, it's not uncommon for 3G to be available throughout the cellular coverage area, but in the United States, it favors urban locales. And while China has awarded licenses for 3G, deployment to date has been limited to trials.

A word on WiMax: There are relatively few WiMax networks today, and many of them are fixed. In the United States, Clearwire operates a network that will transition to WiMax, but its subscriber count is modest. The biggest hope for widespread

deployment is with Sprint Nextel, so keep an eye on what the company does. If it deploys nationwide this year, the service could be an attractive alternative, especially if it delivers promised speeds two to four times faster than current cellular data services.

However, while 3G networks are getting faster, mileage varies, so do your own tests.

While the percentage of cellular carriers' revenue from data plans remains relatively low—less than 20%, even including lucrative text messaging services—the expected year-over-year growth rate is high. Primary drivers are higher data throughput, averaging close to 1 Mbps for many networks; low latency of around 100 milliseconds; availability in most major metropolitan areas; multiple device options, including smartphones, PC Card modems and embedded options for laptops; flat-rate pricing; and an increasing selection of mobile applications and middleware.

Barriers include relatively high pricing, up to $60 per month for unlimited data plans for laptops and $20 to $40 for smartphones; confusion stemming from the large number of carriers and swiftly evolving technology options that now include WiMax; and the fact that radio is not wire, meaning that the most effective wireless applications are the ones specially designed for that medium.

Carriers recognize that lower prices would bring increased usage, but that's precisely what they would like to avoid: 3G networks have relatively limited capacity, so carriers are keeping prices at a level that limits traffic volume. We don't expect substantive cost decreases over the next couple of years.

Another challenge for wireless carriers: The broadband market has become a moving target. Five or 10 years ago, a 1-Mbps wireless-data service would have been most welcome, but with wireline services now five to 10 times faster than mobile offerings, and affordable 100-Mbps throughput forthcoming through fiber-to-the-home services, wireless-data rates will continue to lag wireline services. This shouldn't impact most business applications, for which 1 Mbps or so is more than sufficient. Still, many applications on 3G wireless networks will "feel" slower to users than on high-speed LANs.

SUNNY LONG-RANGE FORECAST

Long term, we're bullish on mobile broadband for both business and consumer markets, despite the relatively slow adoption thus far. With Internet and media companies increasingly targeting the mobile market, and strong pressure to open up carrier networks to more devices and

Mobile's Alphabet Soup

The wide area wireless industry is divided into three major technology groups: GSM, CDMA2000, and WiMax. GSM and CDMA span 2G to 4G, while WiMax spans 3G to 4G.

Technology Group	Data Technology	Availability	Typical Downlink Rates*	Typical Uplink Rates*
GSM, UMTS, LTE	Edge	Now	100 Kbps to 130 Kbps	100 Kbps to 130 Kbps
	Evolved Edge	2008 to 2009	1 Mbps	500 Kbps
	HSPA (assumes HSUPA uplink capability)	Now	600 Kbps to 1.4 Mbps	500 Kbps to 800 Kbps
	HSPA+	Late 2008 to 2009	3 Mbps to 5 Mbps achievable	1 Mbps to 3 Mbps achievable
	LTE	2010 or later	10 Mbps or higher	5 Mbps or higher
CDMA, CDMA2000, UMB	1xRTT	Now	50 Kbps to 70 Kbps	50 Kbps to 70 Kbps
	EV-DO Rev A	Now	600 Mbps to 1.4 Mbps	500 to 800 Kbps
	EV-DO Rev B	2009	3 Mbps to 5 Mbps achievable	1 Mbps to 3 Mbps achievable
	Ultra Mobile Broadband	2010 or later	10 Mbps or higher	5 Mbps or higher
WiMax	Wave 2 in 10 MHz	Now	3 Mbps to 5 Mbps	1 Mbps to 3 Mbps

*Quoted by carriers or expected

applications, we see a bright future—but one that will take a lot of work for carriers and IT groups alike.

While most enterprises have designs for their enterprise networks that include comprehensive security policies and management, the same can't be said about their wide area wireless implementations, which today remain relatively ad hoc.

In a reader poll we conducted last fall, some 70% of respondents report that they're using mobile or wireless apps, but only 18% say that this is widespread within their organizations. Most usage, 40%, was an isolated tactical adoption, perhaps because of price: 65% of respondents say that current unlimited usage plans are too expensive.

As far as whether today's networks are meeting expectations, slightly more than half say yes, with the balance asking for throughput rates of 2 Mbps or more. It's also important to understand what platforms companies are using. Our poll shows about half of current deployments to be on laptops, a quarter on handhelds, and the rest on a combination of the two. E-mail remains the dominant application, as it has been for years, followed by general-purpose Internet access, instant messaging (a surprise to us), Web-based applications hosted at the enterprise, field service, CRM (including sales force automation), and dispatch.

WHAT CAN YOU DO FOR US NOW?

The table on p. 42 shows both advertised and expected user throughputs for the major wireless technology groups, GSM/UMTS, CDMA, and WiMax. What is quickly apparent is that there's relative parity across these technologies.

In the 3G world, neither HSPA (AT&T and T-Mobile) nor EV-DO (Sprint, Verizon) has a clear advantage over the other; in fact, the operators quote identical throughput capabilities. Still, there are differences. For example, UMTS/HSPA allows simultaneous voice and data sessions, whereas EV-DO doesn't. But from a raw throughput perspective, there isn't significant variation.

The same is true for WiMax. Vendors are positioning WiMax as a next-generation technology

Mobile Broadband Balance Sheet

	THE GOOD	THE BAD
1	Broadband speeds with high throughput and low latency	Relatively high usage costs, up to $60 per month for a typical unlimited plan
2	Good coverage with 3G in most major metro areas	Patchwork of 2G and 3G makes it difficult to know what to expect in nonurban areas
3	Wide device choices, including smartphones and laptops with PC Card and USB modems	Confusion factor with multiple 3G technologies and now WiMax in the mix
4	Many enterprise applications work well over today's faster wireless networks	But then again, some critical apps are woefully unsuited to wireless connections
5	Number of mobile middleware options is rapidly increasing	The only thing trickier than picking the right mobile middleware is learning how to use it

that outperforms 3G networks. That may be true of initial WiMax networks, but enhancements will allow 3G capabilities to largely match WiMax by the time it's widely deployed, and the evolution of cellular beyond 3G will be based on technical approaches that are almost the same as WiMax.

Bottom line, wireless technology has become pervasive, especially for voice communications, but wireless data still has a long way to go before it's an essential component of most companies' networking infrastructures. But despite the challenges that are inherent in implementing a comprehensive mobile computing policy, we don't see any significant roadblocks that could stall continued business adoption, especially as an increasing number of enterprise applications either come with "off-the-shelf" mobility extensions or will function via mobile middleware systems facilitated by developments such as Web services.

Companies able to integrate wireless technology on a strategic basis for key job functions are likely to achieve a competitive advantage through greater responsiveness and efficiency.

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