

## The Future for GSM/EDGE in Latin America and the Caribbean

a report by

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New market conditions are combining with old realities to enhance the attractiveness of Enhanced Data rates for Global Evolution (EDGE) as a preferred solution to feed the appetite for advanced communications in Latin America and the Caribbean. With operators struggling to provide profitable services to a growing and highly segmented customer base within existing spectral bands, EDGE provides a highly cost-effective option for both the increasing number of GSM™/GPRS operators in the region and for those Time Division Multiple Access (TDMA) operators not yet committed to an evolved network. With GSM growing to be the region's dominant technology by 2006, and EDGE commitments elsewhere providing commercial volume pricing, the decision to adopt EDGE as the next step towards evolved networks in the region is becoming ever more attractive.

### **New Market Conditions – Redefining Competitiveness**

Latin America came late to the communications revolution and the demand for new and cost-effective wireless services remains strong. The total number of wireless subscribers is rising at an annual rate of 25% as of June 2002 and is forecast to reach over 186 million subscribers by the end of 2006 – an increase of 95 million subscribers. Wireless penetration has surpassed fixed-line penetration in the region as a whole and wireless subscribers already surpass fixed-line subscribers in at least Chile, Mexico, Panama, Paraguay and Venezuela. Several new operators are currently deploying networks in Brazil, Central America and the Caribbean, and regulators in Chile, Colombia, Ecuador and Nicaragua have recently either awarded or are contemplating auctions or spectrum allocations for expanded service options that will undoubtedly increase competition and stimulate even more new waves of wireless users.

In a September 2002 presentation in Mexico – where wireless subscribers stand at 25 million, fully double the number of wire-line subscribers – the nation's Under Secretary for Communications forecast a 21% increase in mobile subscribers in 2003 and another 20% increase for 2004.

Without exception, new operators entering the arena are choosing GSM as their network technology, leading to an impressive growth in the number of GSM operators in the region. Operating in only six nations in the region in 1998, GSM now has a presence established or planned in 21 countries or island territories. At least one major operator – Telecom Italia Mobile (TIM) – has announced its intentions of establishing a 'Pan-Regional GSM Network' to take advantage of GSM's qualities, and four major TDMA operators in the region – Entel Movil (Bolivia), TelCel Radiomovil (Mexico), Telecom Personal (Argentina) and Cable and Wireless (Panama and the Caribbean) – are implementing GSM overlays to their TDMA 1,900MHz or 850MHz networks.

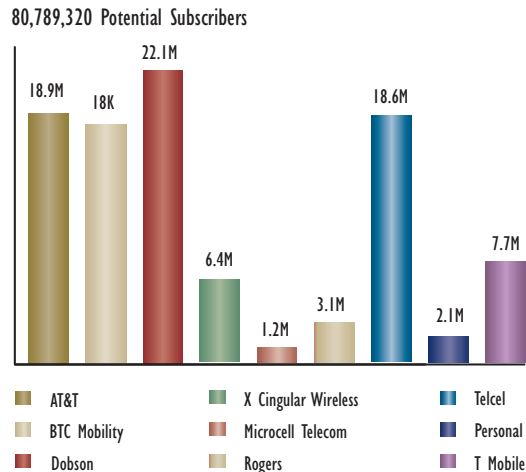
The number of GSM subscribers registered an impressive 59% annual growth in June 2002 and absolute numbers will grow quickly with the commercial launch of TIM Brazil in late 2002. According to Pyramid Research, this trend will lead to GSM's emergence as the pre-eminent wireless technology in the region by 2006.

Even while growth continues, some operators are already introducing a new element of competitiveness in the form of high-speed mobile data networks. Several GSM and Code Division Multiple Access (CDMA) operators are installing next-generation networks – GPRS and CDMA 1X respectively. They are undoubtedly responding to the promise of revenue from the wireless data market in the region, which is also expected to grow significantly. According to recent calculations by a major consulting firm, wireless data revenue in Latin America will rise from US\$200 million in 2002 to US\$5.3 billion by 2006. The Brazilian market alone will offer an estimated US\$1 billion in revenue from wireless data that same year.

Wireless data growth will build on the explosion in short message service (SMS) usage, especially among GSM operators, the evolution of the SMS content industry, and wireless penetration rates that exceed teledensity in multiple countries, as noted above. Operators will offer wireless e-mail, m-commerce, corporate applications and Internet access. Wireless



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**Figure 1: EDGE Commitments in the Americas**

carriers will benefit from offering an attractive means of accessing the global information infrastructure in a region where personal computer penetration rates remain in the single digits.

Continued absolute growth, the increasing adoption of GSM and the onset of high-speed data capabilities have fundamentally altered the challenge facing the operator reviewing network capabilities. The primacy of subscriber growth is increasingly being supplanted by the need to differentiate to retain or grow market share. As coverage, pricing, quality of service (QoS) and application availability gradually become standardised, operators will need to look creatively at new ways of differentiation. Even GSM/GPRS operators will be confronted with the challenge of differentiating their brands among the heavy-user elite.

#### **Old Market Realities – Dealing with Structural Limitations**

Finding the means to differentiate is enough of a challenge but operators will simultaneously have to do so while facing perennial market realities that push everyday creativity and flexibility to the limits. Market demographics drive all operators to serve a small elite of heavy-user contract customers seeking new services as business facilitators and status symbols, coupled with a high percentage of prepaid users on limited budgets. Highly skewed income distribution patterns leave over 60% of many nations' disposable income in the hands of the top 20% of the population, while the bottom 20% controls as little as 3.5% of the income 'pie'. This reality, along with the desire to control monthly spending and the widespread adoption of 'calling-party pays' in the late 1990s, has encouraged consumers to adopt prepaid as the preferred billing method.

Between 67% and 75% of subscribers are prepaid, with some operators reporting as much as 90% of

their customer base as using prepaid. Consequently, average revenue per user stands at US\$25, lower than all of the rest of the world's regions except Africa, and as low as US\$8 per pre-paying user. Creating revenue thus becomes a challenge of providing applications, whether voice or data, consistent with the economic capacities of widely segmented customer groups.

Further complicating the drive for advanced wireless services is a spectrum policy uncertain about the designation of new bands for advanced services, which remain undefined for the region as a whole. Despite the valiant efforts of the regional telecoms co-ordinating body, the Organization of American States Inter-American Telecommunication Commission (OAS/CITEL), towards co-ordinating the designation of new spectrum, five separate pairing schemes remain under consideration for the 1,710MHz to 2,200MHz bands. Clearly, in-band evolution from current to advanced services will remain a more desirable option in the near future without the designation of common new spectrum on a regional basis.

#### **Redefining the Supply Equation – The Role of New Commitments to EDGE**

In the face of new and old market realities in Latin America, multiple North and South American operators have ratified EDGE as their technology of choice for advanced wireless services, with multiple effects. EDGE has arrived on the scene because of the confluence of several factors. The fragmented spectrum allocation policy in the US forced US operators to consider solutions that could deploy high bandwidth mobile data services within existing spectra. Also, new subscriber acquisition is slowing and mobile data services are perceived as a continuing revenue growth driver. The attractive demographics of the US market, based on both size and affluence, stimulated vendor interest and corollary investment in research and development (R&D).

The commitment devolves from the compatibility of EDGE with North American market requirements and has resulted in the ratification of EDGE as a commercially deployable choice for providing advanced services, despite predictions to the contrary by advocates of competing technologies.

EDGE deployments in 2003 will provide clear evidence that it has a positive future as a wireless services platform. Moreover, because the commitments involve major operators, including AT&T Wireless, Cingular, Rogers Wireless (Canada), T-Mobile (the US) and TelCel Radiomovil (Mexico), EDGE technology will become available in the near and medium term to a critical mass of customers – currently totalling more than 80 million.

Operator commitments to invest in EDGE networks are generating a corresponding commitment to EDGE equipment. EDGE terminals will be commercially available from multiple sources by 2003 and, by 2004, EDGE will be incorporated as a standard feature into all new GSM terminals and it will gradually be phased in as a feature in UMTS™ terminals. Likewise, EDGE capabilities are an integral part of new GSM base stations, making an upgrade to EDGE dependent primarily on installation of a new channel card in the base transceiver station and new software installed in the Base Station Controller/Packet Control Unit.

### **Building on GSM Market Dominance**

The 'generational compatibility' of EDGE with other elements of evolved GSM networks adds to its attractiveness as a solution for Latin America's highly segmented markets. Building upon massive economies of scale that yield handset prices up to 30% less than other technologies, as well as reduced capital costs, tens of billions of dollars in roaming revenues and priority status among the developer and vendor communities in general, GSM will grow to occupy a 41% market share in the Americas by 2006.

On a global basis, GSM-based solutions (GSM, GPRS, EDGE and UMTS) will dominate mobile handset sales in 2006. Adoption of EDGE allows for the creation of a GSM/GPRS/EDGE network with segmentation of subscribers into low, mid and high-end user groups with technologies that will not face obsolescence. Compatibility with GSM networks represents a tremendous upside relative to economies of scale, continuing R&D and international roaming. The compatibility of GSM/EDGE and UMTS systems will also protect investments in EDGE.

EDGE also conforms to the realities of the Latin America and Caribbean spectrum distribution, further contributing to its attractiveness for widespread adoption in the Americas. EDGE will be first deployed in the standard American frequency bands (first 1,900MHz and then 850MHz) and at least one major vendor will begin producing EDGE equipment in the 900MHz and 1,800MHz bands in early 2003. Without the requirement for additional spectrum and benefiting from its ties with the market dominance of GSM-related technologies, EDGE offers a cost-effective choice for delivering advanced data services.

### **Sustaining Higher Levels of Quality Service**

EDGE's technical endowments are on a par with its commercial attributes, allowing EDGE to provide diverse high-speed applications suitable for

entertaining and informing the most demanding customers. EDGE boosts GPRS capabilities through modulation techniques, adaptive coding schemes, incremental redundancy and several protocol and QoS enhancements. EDGE produces realistic data throughput rates between 80Kb/s and 130Kb/s, with peak data rates up to 240Kb/s for four time slot mobiles. EDGE modulation improves the GPRS data rates threefold and produces actual throughput rates from two to four times that of GPRS. Other enhancements, such as the adaptive multi-rate codec will add still more capacity. These will translate into increased capacity and capital expenditure savings for the region's voice-centric operators, yielding in turn long-term revenue gains from mobile data services. By providing the delivery mechanism for multimedia and enhanced message services, streaming content and high-speed Internet access, EDGE allows Latin American and Caribbean operators to make major strides towards closing simultaneously the digital divide and the revenue gap.

### **Looking Towards the Future**

For all its attractiveness, EDGE is not a panacea. There continues to be an urgent need to re-examine the fiscal and regulatory burdens that fall disproportionately on the communications, and especially the wireless, sectors through Latin America and the Caribbean. Economies still challenged by underdeveloped communications services cannot thrive with policies that tax wireless and wireless services more heavily than they tax alcohol, for example. The industry overall needs to make its case more clearly, overcoming inherent divisions created by different origins of investment capital and linkages, or the lack thereof, with wire-line investment.

Finally, in the content arena, there are at least two critical requirements. First is the need to develop culturally sensitive and practical software solutions that will apply the rich capabilities of the latest wireless developments such as EDGE to the daily information needs of the marketplaces. Simultaneously, but with no less sense of urgency, national governments need to commit themselves to harnessing the capabilities of the wireless technologies like EDGE to resolve pressing public service needs.

As part of an enhanced public-private partnership in the region, and fully supported by a vibrant software development programme, EDGE will make great strides towards providing the quality and quantity of wireless services demanded by the region's long-pending social and economic needs. ■

*A version of this article, which includes three additional graphics, can be found in the Reference Section of the CD-ROM accompanying this business briefing.*