

WHITE PAPER

Extending Mobile Infrastructure Investment Benefits: A Backhaul Solution

Sponsored by: Memotec

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IN THIS WHITE PAPER

Mobile networks have been deployed in all corners of the world. It now serves over 4 billion subscribers and has become the most ubiquitous and important means by which human beings connect with one another. It is therefore no surprise that investments in the technology are substantial, amounting to in excess of US\$ 50 billion annually. Over the next few years, investment levels are expected to remain high as subscriber growth persists and mobile data traffic levels continue to explode. Beginning in 2011 and beyond, IDC anticipates a further upside to the infrastructure opportunity as a result of LTE, the latest generation of wireless technologies currently commercializing.

Amidst this enormous opportunity are mobile operators facing hypercompetitive markets, ever-changing customer tastes, and fast-evolving technology. This means mobile operators can never stand still. They must innovate, bring costs down and, given already significant investments made, leverage their networks as much as possible. To this end, a mobile operator is presented with a multitude of options and potential strategies from technology vendors. One such approach gaining increasing market acceptance is dynamic bandwidth optimization and compression. These solutions offer, with minimal capital investments, the potential for significant OPEX savings – OPEX savings achieved through increased capacity and efficiency in the existing mobile network.

One company hoping to capitalize upon this mobile opportunity is Memotec. The firm's Mobile DCME is a next generation voice compression solution that has been combined with advance packet processing capabilities. The combination delivers OPEX savings specifically to mobile operators managing subscriber growth and rapidly expanding mobile data traffic levels. It delivers the OPEX savings and capacity expansion without compromising voice quality.

This white paper examines current trends in the mobile infrastructure market space and Memotec's Mobile DCME solution.

METHODOLOGY

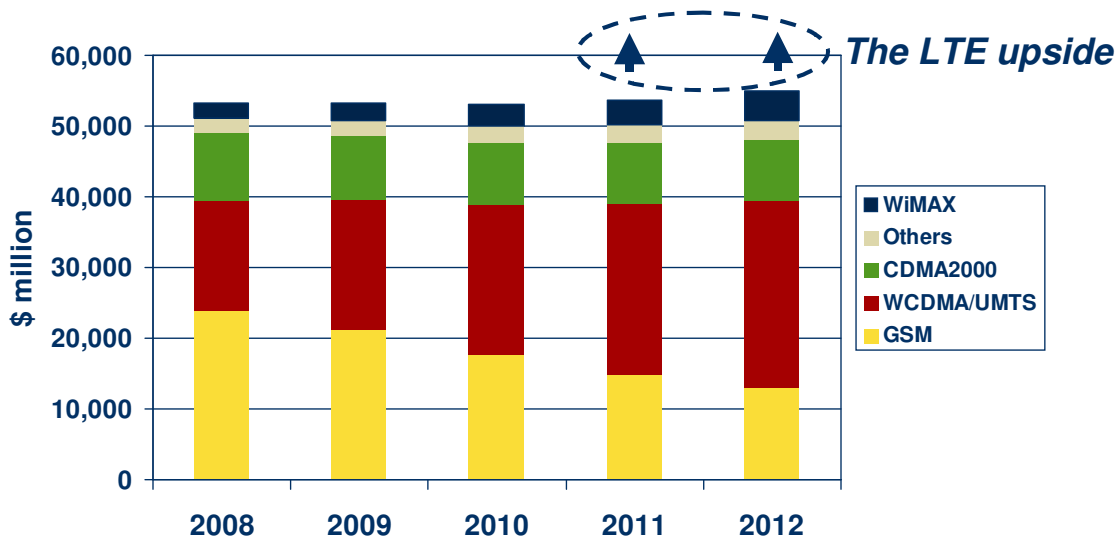
In preparing this study, IDC conducted interviews with the Memotec team. In particular, IDC examined Memotec's mobile backhaul DCME solution. The information gathered through the interviews was supplemented with IDC's in house resources of wireless infrastructure market information and analysis. Various secondary sources, including press releases, marketing and technical literature, white papers, filings with Securities and Exchange Commission (SEC), quarterly conference calls, and reports published in trade and business journals were also consulted.

SITUATION OVERVIEW

Wireless infrastructure is a sizeable and steady industry. Spending will amount to in excess of US\$ 50 billion in 2009 and is expected to remain steady in the coming years. A further upside to the market is offered by the entry of next generation technologies such as LTE (see **Figure 1**).

FIGURE 1

Worldwide Wireless Infrastructure Markets, 2008 - 2012



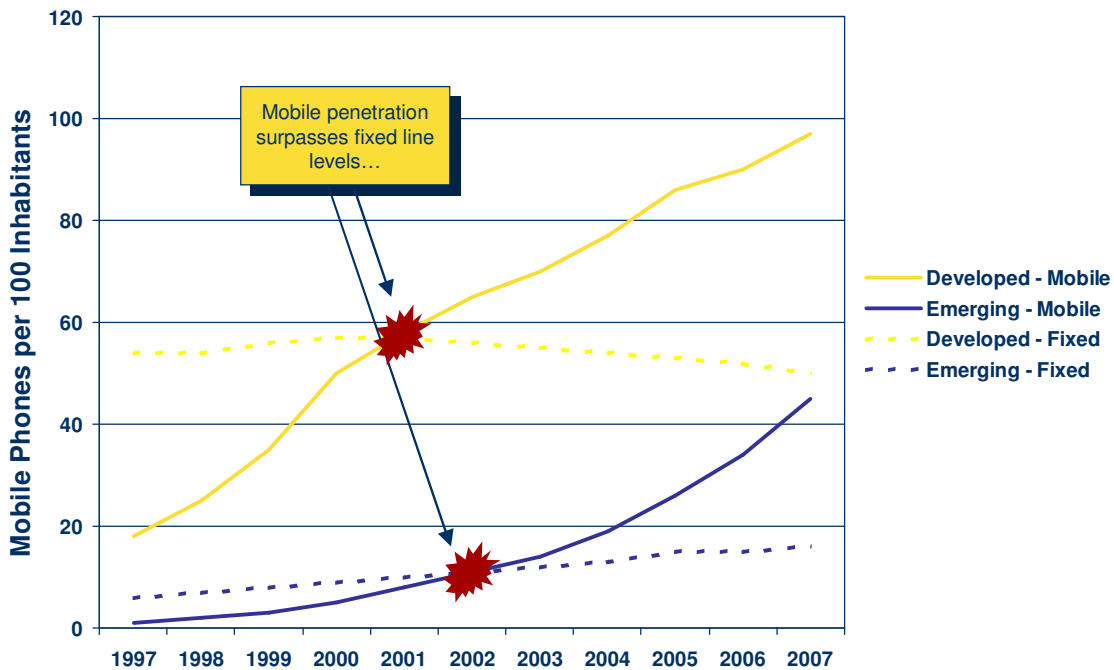
Source: IDC, 2009

The sizeable opportunity is a result of tremendous growth since the 1990's. Networks have been deployed in all corners of the world and now serve over 4 billion subscribers. Mobile communications has become the most important and ubiquitous

means by which human beings connect with one another. One country after the other, since the turn of the millennium, has seen mobile penetration surpass fixed line levels. By 2002, the world had more mobile phones than telephone lines in service (see **Figure 2**).

FIGURE 2

Mobile Communication Connects the World (Developed and Emerging Markets)



Source: IDC, 2009

Amidst the widespread adoption of mobile technology, the industry continues to grow and transform. Discussions have shifted from whether another billion subscribers will arrive – in many respects that is a given and just a matter of time – to the possibilities presented by tens of billions of devices connected to the network. A world, as noted by some wireless infrastructure vendors, with as much as 50 billion connected devices.

The opportunities and challenges for a mobile operator are enormous. In addition to the scale, markets are hypercompetitive, technologies changing fast, and consumer tastes evolving. This means operators can never stand still. They must innovate, bring costs down and, given the already significant investments made, leverage the network as much as possible. Leveraging the network entails exploring ways in

which, with minimal investments, it can be optimized to accommodate further subscriber growth. Voice compression technology, an approach that has long intrigued mobile operators around the world, is one such solution.

Memotec, through its Mobile DCME solution, is a company seeking to capitalize upon the opportunities in this area. The Montreal based technology firm has delivered over 100,000 products and solutions to customers in some 100 countries across the globe (see **Figure 3**). Specializing in optimization solutions for wireless networks, the company has taken digital PCM voice compression technology, which has long been used in the telephone network, to the next level for application to fast congesting mobile networks.

FIGURE 3

Memotec's Global Presence



Source: Memotec, 2009

EXAMINING THE MEMOTEC SOLUTION

Memotec's Mobile DCME

Mobile operators face two major challenges in their effort to cope with growing voice and data traffic. First is the reality that not all base stations have access to fiber based transport for connectivity to a BSC/RNC or the core network. In these situations, carriers must rely on leased lines, microwave or even satellite based solutions. In North America for example, IDC sees significant use of leased lines while microwave and fiber based backhaul are growing rapidly. For the rest of the world, microwave technology is the most common solution. While fiber alternatives are effective, they

can be costly and face problems of geographic scalability, particularly as mobile data traffic continues to explode. Second is the infrastructure challenge presented by mobile data traffic itself. Prompted by changing customer usage patterns and enabled by the ongoing transition from 2G to 3G, the amount of data traffic in mobile networks is expanding rapidly. This new network paradigm often requires operators to utilize TDM and packet based backhaul solutions concurrently – a costly and ultimately inefficient utilization of resources.

To help mobile carriers with these challenges, Memotec offers its Mobile DCME solution. Key features of the Mobile DCME include bandwidth compression of up to 16:1 and up to 8:1 SS7 traffic optimization. This means that it can take a 64 kbps voice channel all the way down to 4 kbps. The Mobile DCME also aggregates voice and data traffic. By coupling voice compression with advance packet processing technology, the Mobile DCME is able to bridge the gap between the 2G and 3G worlds. The solution is therefore 3G ready. Finally, a mobile technology friendly codec is utilized to ensure voice quality levels are maintained. Other key attributes of the Mobile DCME include:

- ☒ Codec choice: Memotec utilizes the toll-grade G.729 voice codec. This ensures higher voice quality, particularly when used in tandem with existing GSM codecs. They are particularly effective for long delay backhaul links (such as satellite).
- ☒ Transcoder free operation: Memotec utilizes a proprietary voice trunking protocol that delivers a single, end-to-end compression cycle. This means a voice call does not run the risk of quality degradation resulting from multiple compression and decompression cycles.
- ☒ Echo cancellation: The DCME's echo canceller is built upon Memotec's years of experience providing voice compression solutions over satellite links. These links provide some of the most challenging environments for preserving voice call quality. Memotec's solutions have also won numerous awards.
- ☒ Data interfaces: The Memotec solution full recognizes the growing role of data services in the mobile network. To this end, the Mobile DCME is designed with full support of the various data services and interfaces present in the MSC or BSC.
- ☒ Real-time network management: Memotec's CXMON is a software based probe that is embedded in the Memotec device. This allows the operator to monitor network conditions and performance, and troubleshoot the DCME system in real time.

According to Memotec, installation of the Mobile DCME can be done in a couple of days. Validation and trouble checking lasts two (2) to three (3) weeks. The overall process requires less than a month.

CHALLENGES/OPPORTUNITIES

Memotec collateral states that DCME bandwidth optimization and compression is "the best kept secret in mobile networking and telephony." While an effective tagline, it also captures the fundamental challenge and opportunity faced by the company.

Continued growth in subscribers (the next billion) coupled with exploding data traffic (50 billion devices connected to the network) means that pressures to the mobile network will persist. It will be critical that as mobile operators create a logical transformation path towards next generation technologies that they also leverage the existing infrastructure as much as they possibly can. Memotec's Mobile DCME solution affords mobile operators with an effective means to address these very challenges. Mobile DCME expands the capacity of the existing network and does so without any penalty to the quality of the voice call. In addition, the system fully recognizes the ongoing transition numerous carriers are going through as they move networks from the 2G to the 3G world. Memotec's Mobile DCME is future-proof, capable of handling and managing traffic in both environments. It prolongs the usability of the existing infrastructure while at the same time assisting in the migration towards the next generation network. Consequently, implementation of the Mobile DCME is potentially a "win-win" scenario.

The biggest challenge, on the other hand, is a matter that is also captured in Memotec's marketing tagline – that of voice compression technology being a "best kept secret." To be sure, the concept of voice compression is well recognized by mobile operators around the world. Its acceptance however requires further momentum building. Market education is critical. While every mobile carrier recognizes the need to maximize returns from their network and voice compression is a natural and logical strategy to explore, trepidation remains over its effectiveness. Over two-thirds of a typical mobile operator's revenues are still comprised of voice related services. Consequently, carriers have little to no tolerance for any effort that could potentially jeopardize voice call quality. Past experience has heightened carrier concerns. For example, several years ago, a major South American carrier sought to address capacity pressures through this very approach. While the solution delivered additional network capacity, voice call quality was severely degraded (customer's noted an "echo and hollow" sound to their calls). The end result was lower customer satisfaction and, since the solution had to be removed from the network, no real increase in network capacity. The operator lost time and, even more critical, market momentum to its competitors.

Voice compression technology has progressed significantly the past couple of years. Memotec's DCME solution is part of this next generation. The firm's roster of clients includes major mobile operators such as the Orange Group, Orascom, Telefonica, BSNL, Vimpelcom and China Mobile. This is already an impressive and significant list. Still, it will be imperative for Memotec to educate the broader marketplace. A comprehensive and aggressive go-to-market strategy will be essential. Client testimonials will be important for early credibility building. Memotec must also carefully manage resources and deploy them effectively across a customer base that is not only growing but also spans the entire globe. While Memotec has greater resources than the competition, including the ability to leverage the worldwide presence of its parent company, ComtechEFDATA, it will still be important to

strategically locate its team of experienced applications engineers. Existing and new customers must be served in the most efficient manner possible. Partnerships with big box vendors and systems integrators can also broaden the firm's marketing scope, reach, and capabilities. Such partnerships can provide a means to spread knowledge of its technology to a larger audience in a lesser amount of time.

CONCLUSION

Mobile communications continues to grow and transform. The pressure for mobile operators to leverage their networks further, while at the same time creating a cohesive and logical transformation path towards the next generation, is at an all time high. Creativity and effective thinking "outside the box" will be what distinguishes operators from one another. Compression technologies offer a creative means by which to extend the life of the existing network and, if the proper solution is chosen, a means to help manage the transition to the next generation network. In pursuing this strategy however, mobile operators must be cautious. Potential partners must possess a proven track record and demonstrated capabilities. The right partner choice will be critical to success.

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