Paving the Way to Volume LTE Adoption

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Consider any downtime you've had recently while commuting –any time spent waiting in an airport lounge, or even walking down a busy street. There will have been people looking at messages on their phones, catching up with their email, watching videos on their tablets, perhaps even engaging in a little video conferencing. All of them are taking advantage of the benefits of high-speed broadband on the go. This demand for mobile connectivity is showing no signs of slowing down.

In the near future, we'll start to see a new world of features and applications that take greater advantage of mobile broadband. We'll increasingly see the virtual world of multi-player games going mobile on smartphones and tablets, while social networking will continue to drive the exchange of user-created content and mobile video blogging going mainstream. Further, phones and tablets will lead the way in devices that will be connected as car infotainment systems. Consumer electronics and all manner of embedded Internet systems will start to take advantage of the opportunities presented by broadband on the go.

This insatiable demand for high-speed mobile broadband poses a significant challenge for the industry. The available bandwidth is limited. That is to say the amount of bandwidth is going to be spread more thinly as the demand for high-speed Internet on-the-move grows. The answer is relatively simple. The next generation of mobile Internet will be based on Long Term Evolution (LTE), a new technology designed to increase the speed and capacity of mobile networks.

Pressure points

For the industry to benefit from the greater efficiencies presented by LTE, the next generation of phones and other mobile devices that enable available bandwidth to be allocated more efficiently has to arrive very quickly. How this happens affordably is significantly more complex.

Inevitably LTE handsets have started to emerge. It is now perfectly feasible to go and find a selection of LTE-capable handsets (although you won't find an LTE network in all countries just yet) – but the problem at the moment is that they are all above $600. This will keep the price of LTE services artificially high as well as the price of the handsets. It works like this: expensive handsets mean only a minority will take up the service, so economies of scale fail to materialize, and the service remains expensive. It was this vicious circle that contributed to the slow adoption of UMTS in Europe.

More importantly from an industry point of view, this will limit innovation and the development of the new services that make a fully connected world viable. Jobs as

well as technology making customers' lives easier will depend on this. Research firm Gartner says that approximately 10 percent of global wireless subscribers will have LTE by 2015, but if this is to benefit them and the people to follow, then the barriers to entry – particularly the handset costs – need to come down to around $200-$400 – bringing LTE to the real volume segment.

Market drivers

As long as the affordability issue can be addressed – and Renesas Mobile is one of the companies with a coherent strategy to make this happen – LTE will be driven by two overarching trends. First, smartphones will become mainstream after a time spent as a niche, as all technologies do. Second consumer electronics devices will continue to become smarter and more capable, seamlessly integrating services and applications that today seem complex.

The demand for LTE – in an environment in which even new televisions are being sold as "connected" – is certain. It will be a business necessity in the near future. The opportunity for the expensive handset and other equipment will be narrow because customers, whether in business or the consumer market, will expect the technology to be mainstream very quickly.

There are however a number of barriers to achieving the right price point and functionality that will allows devices to go mainstream as quickly as they need to.

Blocks

Most of these involve the complexity of the chipsets and indeed the number of components in the electronics needed to make an LTE device work. Many of the offerings currently on the market are based on multichip architectures, and the LTE component is added as a separate modem – so it has to be paid for in addition to, rather than instead of the existing communications components. Two-chip architectures represent the early entrants to the market where speed is of the essence, and inevitably these are more expensive than single-chip solutions. The separate modem arrangement also consumes a significant amount of power and of course, additional space. Just like the first 3G handsets, early LTE devices tend to be expensive, larger and consume significantly more power than their predecessors as they are essentially two handsets in one.

Renesas Mobile has a solution to address these issues, and to help accelerate the uptake of LTE with the introduction of its MP5232, the first integrated multi-mode LTE smartphone platform optimized to meet the exacting demands of the fully featured smartphone volume market. At its heart, the Renesas Mobile modem, with

over 2 billion deployments, is the most frequently used modem in the world. The MP5232 platform combines this modem technology with a state-of-the-art multi-core application processor. The result is a highly integrated multimode single-chip Communication Processor platform, combined with unique power saving technologies, making it an ideal solution for designs requiring true broadband connectivity and high performance in low power devices.

Furthermore, the inherent flexibility of the MP5232 allows each OEM customer to select whicheverfeature sets each market segment requires. Time to market is shortened as the need for re-certifying and re-inventing prior work is minimized. As a result, handset manufacturers are well placed to create and deliver multiple differentiated LTE handsets to market quickly and at an attractive price point.

Volume market
If LTE is going to reach its potential – and for the ongoing investment in the technology to pay off, it has to – then it will have to bethe volume market rather than the higher end market that adopts it. This is where affordability becomes an issue. There is a need for high performance multi-core processing, high-resolution multimedia, and stereoscopic video support.

The next stage of adoption is going to be crucial in taking the market forward. Gartner says LTE is the fastest growing technology ever and this means the devices will have to be ready sooner than in any previous technology cycle. This is why a scalable modem common to all of the devices will be essential to bring the price point to $200-$400 during 2012. It needs a rich function set, low power and total scalability. The opportunity will be huge, and standardization plus scalability and low power consumption are going to be the drivers that make it happen. As with previous technologies, the essential thing is to make proven technology available at new price points – the difference being the speed at which this needs to happen.

Within a few years one in ten of us will be using this without even thinking about it, and will have long forgotten the complexity it took to make it work universally. In the meantime, the minimalist, single-chip approach appears to be the best means of allowing the technology to become established.

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