

The road to 40G

More bandwidth hungry applications means network providers must move quickly to 40Gbit/s systems. By **Eric Gregory**.

The buzz in telecommunications today is all about the rapid shift towards session based communications and the unrelenting growth of bandwidth hungry applications.

Accompanying this is the increase in the number of 'apps' available on smartphones. In the typical 'build it and they will come' philosophy, users and application providers continue to maximise all increases in speed that are offered.

From a technical perspective, the growing industry push behind the deployment of 4G and WiMAX networks is responding to customers' demand for more and more high bandwidth applications, specifically video. This next generation of networks will not only provide improved spectral efficiency, it will also provide increased throughput and decreased latency; items that are very beneficial to video.

Today, the majority of the telecommunications industry operates on 10G systems. Now, however, the industry is looking to 40G systems to support higher bandwidth applications in video, 3G and 4G wireless and security applications.

Mobile growth has been truly phenomenal, especially during the last five years with the global mobile subscriber base reaching 4 billion in



GREGORY: "THE SHIFT FROM 10G TO 40G xTCA PLATFORMS IS EXPECTED TO

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December 2008. Though voice has been one of the drivers fuelling this revolution, data usage has also seen impressive growth. Mobile subscribers are already changing the way they use the internet, as they look to access much more diverse content on their handsets, including a heavy dosage of video. Today, a single high end smart 'phone – such as an iPhone or a Blackberry – generates more data traffic than 30 basic feature mobile phones, while a laptop air card generates more data traffic than 450 basic feature mobiles.

Another market driver for 40G is Deep Packet Inspection (DPI). As data traffic explodes through

the service provider network, DPI functionality allows service providers to offer a wide variety of value added services. These premium services require traffic management, monitoring and content modification at the application layer. With these capabilities, service providers monitor and bill for advanced value added service usage contributing to increased Average Revenue Per User (ARPU).

However, what DPI is best known for is enabling advanced security functions in the network. Investment in DPI and demand for DPI capabilities is expected to grow as these high

bandwidth applications become more complex.

In addition to mobile video applications and DPI, equipment manufacturers and operators are also expecting to continue to access existing I/O speeds. However, with ever increasing subscribers and associated bandwidth use, they will need more I/O. This is where increased fan out will also play a role in driving the transition to 40G. One of the benefits of 40G is increased switching capacity and this increased capacity allows additional I/O ports, enabling more revenue generating opportunities for service providers.

All of these factors have a tremendous impact on network elements and platforms such as ATCA, which network operators will employ to deliver the higher speed applications. The commercially proven ATCA open hardware specification was designed to meet the demanding needs of evolving networks. Not only is the ATCA specification continually updated to include higher speed backplane technologies, such as 10G-BASEKR and 40G-BASEKR4, it also enables the ATCA ecosystem to take advantage of the next generation of processors as a result of the modularity of ATCA.

The shift from 10G to 40G xTCA platforms is expected to start to gain momentum in 2010 as network equipment providers deploy new network elements, with 10G systems giving way to 40G systems as early as 2011. However, in order to meet those aggressive timelines, network equipment providers must make technology decisions today because the typical rollout of an ATCA based application is roughly 12 to 18 months.

10GBase-KR technology, which is 10G serial and forms the basis for 40G, will be the first technology to come to market in 2010. This will be followed by 40GBase-KR4 systems, which are anticipated to begin appearing in the market from 2011 onwards. Both the 10GBase-KR and the 40GBase-KR4 technologies are expected to be ratified by PICMG in 2010 as new additions to the ATCA specifications.

As the industry transitions from 10G to 40G, there are four key requirements for developing a 40G platform that should be considered. Network equipment providers should also look at these requirements when evaluating a 40G ATCA system:

The first requirement is investment protection. There are many ATCA platforms currently in the market and the 40G platform



The ATCA-4500 is RadiSys' seventh generation single board computer. Based on the Intel Xeon processor, the single slot ATCA module is suitable for control plane and server functions in LTE wireless infrastructure, deep packet inspection, IPTV and IP multimedia subsystems.

must be backwards compatible with existing boards. This will guarantee network equipment providers a smooth and easy transition from their current 10G platforms to 40G platforms.

The second requirement is the 40G backplane itself. The backplane should have full node connectivity to all of the slots that support 10G KR as well as 40G KR4.

The third requirement is a switch. The switch must be capable of delivering both 10GBASE-KR and 40GBASE-KR4 switching to the node slots.

The final requirement for 40G platforms is that

there are node slots capable of supporting next generation packet processing and cpu processing capability.

The RadiSys ATCA 4.0 initiative is the company's fourth generation of ATCA products designed to support the next generation of high bandwidth applications such as LTE, WiMAX, DPI and Mobile Video. The fully integrated 40G ATCA platform features the latest technology in the industry, incorporating 10GBASE-KR and 40GBASE-KR4 capable backplane and 40G switching capability.

RadiSys' ATCA 4.0 products provide scalability and density in an ATCA form factor with a fourfold performance improvement in both switching and processing capabilities over 10G components. These fourth generation ATCA platforms combine a 40G chassis, a 40G switch and other 10G and 40G assets in a preintegrated platform that enables the deployment of next generation 4G applications such as LTE and WiMAX.

4G wireless, mobile video and security applications will all have a widespread impact on the network, not only in terms of the type of applications that customers will be using, but also in terms of the increased bandwidth required. That, in turn, affects what network equipment providers demand in terms of the kind of platforms needed to run their applications. Network equipment providers will begin the major transition from 10G to 40G with the deployment of new network elements in 2010, but must be able to make technology decisions today in order to start hitting those market targets.

RadiSys' 40G platform provides a step increase in performance and it provides investment protection, so customers can either port from what they have today or they can start off the bat with 40G to meet next generation bandwidth demands. ATCA 4.0 enables RadiSys' customers to make those technology decisions today so that they can roll out those platforms in accordance with the generally accepted timelines for deployment.

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