

Convergence – Miles to Go***Why so slow, when everyone agrees it's a good idea?***

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Most people in telecoms agree that data/voice/video convergence has just got to happen sometime. All-IP architectures offer economies in the networks as well as new service opportunities, so everyone says. Why are we not moving more quickly to this new world? It's a big job, and there is still lots of room for technology improvement. But above all, carriers have to make money.

Talk to anyone in telecommunications, and they agree that “convergence” is going to happen. By “convergence”, we all mean the move towards a single transport and switching network carrying data. This is contrasted with the old world of telecommunications in which voice and data are carried on separate networks. In the converged world, voice and video become just services carried on an infrastructure optimized for data.

For years now, big carriers have been building *core* networks that are essentially data networks that also carry voice traffic. This is a simple matter of economics. Where voice and data travel along the same routes, it makes sense to consolidate traffic to make best use of the infrastructure investment. Digital encoding of voice enabled this to be done, and it was being done, long before IP came along.

Internet Protocol (IP) provides a tool that enables this convergence to extend beyond the core network, across the access networks, into the customers' premises. Given access to an all-IP network at a high enough bit-rate, all current communications needs can be satisfied for all customers – real-time voice, data transfer, video broadcasting, video-on-demand, interactive gaming, videophone, audio streaming, video conferencing...

From the perspective of the customer, service possibilities are unlimited. From the point of view of the telecommunications carrier, there is only one service – transporting the bits.

So where are we today on the road to convergence? For most telecommunications end users, voice and data are still presented as separate services. And for most consumers and small business, high speed Internet access is not available, at least not at a price they are prepared to pay.

There are two steps needed to get to convergence. First, users need high-speed access to a high-capacity, reliable IP global network (the Internet, or rather an improved version of it). Second, to complete the picture, customers and carriers will migrate voice traffic onto the IP network. For the purposes of this article, let's focus just on step one, which is challenging enough.

Who is working on the challenge of providing high-speed access?

In the USA, the cable TV companies initially set the pace. By the end of 2001, cable modem services were available to 70 million US homes, and 7.2 million households subscribed to the service (NCTA figures). The cable TV industry's research and development consortium, CableLabs, has created an industry standard, DOCSIS (Data over Cable Service Interface Specification). The latest release (1.1) addresses some earlier problems by providing a more solid platform for Voice over IP and enables cable operators to sell tiered levels of Internet access based on bandwidth. DOCSIS 2.0 is under active development and will offer faster speeds upstream: many customers are limited to 128Kbps upstream now, but the new standard will, it is claimed, offer the capability to offer symmetric services up to 30 Mbps in each direction. This will make cable modem access a realistic option for data-intensive businesses and will increase the revenue opportunities for cable operators.

In general the big incumbent access providers have been criticized for being slow to act (that is, to spend their money). Clearly, they have been torn, realizing that the objective sought by so many is a future in which their ability to make high profits will be constrained. IP connectivity will be commoditized, and voice traffic will be just another application.

However, after a slow start, companies are starting to talk more aggressively about IP-everywhere networks. BT, NTT, and BellSouth are just three examples. The big telco access providers now all offer xDSL services, and some are building out fiber service areas to increase their DSL reach. Some companies are considering reorganizing into wholesale and retail businesses, as the only way to maximize return on sunk network investment without being bound to out-of-date service business models. BT has taken this path, and rapidly acquired more than 60 resellers of their UK-wide xDSL services. In the US, ADSL service can now be supplied to more than 50% of households, but the actual uptake is less than 10%.

The cable companies and the big telcos are clearly the dominant players in the broadband access business. But there are other players who have the technology to make a difference in some markets:

- Building developers are starting to bundle the cost of fiber-to-the-home into the cost of new houses. When the infrastructure is installed at the outset, the capital cost is relatively low, and furthermore, it can be recovered up front.
- Municipal authorities may step in if commercial operators are not prepared to build infrastructure. They view high-speed access as simply infrastructure supporting a utility service, like water or drainage, and they

are accustomed to a financial model based on cost recovery over a long term.

- Electricity companies are already in the Gig-Ethernet business, and it's not a stretch to conceive of them providing fiber-based services to consumers too, eventually. In the nearer term powerline technology may provide even more cost-effective ways for electric companies to deliver high-speed access. It has already been deployed in rural areas in several European countries.
- There is a long list of companies developing "breakthrough" fixed broadband wireless access technology. We shouldn't overlook the possibility that despite the dashed hopes of the last three years, someone will come up with a solution that can provide the speed, reliability and low cost that will transform the access business. Finally, let's not forget 3G (cellular) wireless. As a technology, it works. As a business, it still faces a challenge.

So much for deployment: the industry is not inactive. But let's go back to those take-up rates... In the US only around 10% of homes that could subscribe to cable modem service chose to do so. The proportion of households that subscribe to DSL is even smaller. Market studies show that the majority of households simply do not consider the benefits of high speed internet access to be worth paying a lot of money for.

What is the prospect that any of the high-speed service providers, using any of the available technologies, can bring down the price of the service to make it as ubiquitous as – for example – the telephone? Or as common as television? Frankly, for most people, those who don't do on-line work at home, or who are not passionate on-line gamers, the price isn't worth the benefit, especially when they're already paying for a phone, and for cable TV.

High-speed might be more attractive if it could be used to access broadcast TV, video on demand and audio on demand, but established cable company business models, and the kind of adherence to copyright law favored by media companies, make that problematical. Or it would help if high-speed access could be used to access carrier-grade telephony at much lower cost: but the telephony industry is not going to redesign itself to make that happen, not until it has to.

It is almost certainly true that by combining all services onto one IP connection, a carrier unencumbered by a legacy business could sell the combined service at a price that people are prepared to pay, and still make a profit. But the players best positioned right now do have significant legacy considerations. They must take into account the fact that the combined revenue streams would be much lower than the sum of the present streams from cable TV, telephony and Internet access. It's not surprising that they are trying to minimize cannibalization of their current revenues for as long as possible.

So while technological convergence is entirely possible, and convergence of services is entirely conceivable, don't expect it to happen fast. This is a situation where even if everyone agrees where we will end up, not everyone is enthusiastic about making the uncomfortable journey needed to get there. Perhaps it will take a newcomer – a player not hidebound by the legacy conventions of telecoms and media distribution – to disrupt things and accelerate the process. It wouldn't take much: just a willingness to deploy new access technology, rewrite the rule book on telephony, and to turn the media distribution business upside down. Plus a sound bank balance and lots of nerve.

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