Europe's next-generation broadband

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An enormous research effort by Europe's leading broadband players has helped accelerate dramatically the rollout of next-generation broadband services reaching speeds in the 10s of Mbit/s in many European countries. That is just the start.

The deployment of broadband services in the 10s of megabits per second (Mbit/s) is accelerating across the continent, thanks to the research efforts of Europe's main broadband players. Even 100Mbit/s has become economically feasible and deployments have started.

Two years ago Europe's leading telecoms, ISP companies, and its top technology vendors and research institutes finished their work on the first phase of the MUSE project. That effort led to a new set of standard specifications for broadband technology branded as the Global System for Broadband (GSB).

"The MUSE project did not start the push for next-generation broadband technologies and services," notes MUSE project coordinator, Peter Vetter. "Many companies and institutes were working on it already. But MUSE certainly helped to establish a consensus on what it should look like and what it consisted of, and that accelerated the deployment of a new architecture and better access technologies."

Risk-free roadmap?

By helping to establish standards, and by defining a roadmap that gained industry consensus, the project limited the risks faced by the main

stakeholders, and boosted stakeholder confidence. Increased broadband investment is the result.

Already in Belgium, the Netherlands, the UK, Germany and other countries, providers are deploying services with vDSL (Very High Speed Digital Subscriber Line), an access technology that offers up to 100Mbit/s.

“Our project responded to some of the obstacles facing Broadband4All, a major strategic thrust of European policy under the Sixth Framework Programme. There are many elements needed to make Broadband4All a reality, so it took a large integrated approach to tackle all the technical issues,” Vetter reveals.

EU-funded MUSE, which stands for Multi-Service Access Everywhere, tackled those issues. It was a huge project. It had €60 million, half of which was funded by the European Commission, and a research agenda that looked into every aspect of broadband access technology.

Broadband access architectures, access and edge nodes, dsl, fibre optic, fixed wireless, back-end integration, interconnection between public networks and home networks, and generic test suites, are just a few of the issues that the MUSE team looked at.

“There is often misunderstanding; people think we were just looking at improving the access bit-rate, but that aspect of the project accounted for only 20% of our budget. The main challenge was to enable multi-service delivery through an integrated end-to-end approach,” Vetter explains.

Complementary phases

The MUSE project was organised into two, complementary phases of

two years each. Phase one focused on the technical architecture for next-generation broadband networks. This architecture was dubbed the Global System for Broadband (GSB) and it is this work that is responsible for the accelerated broadband deployments.

The second phase of the project (developed further in a follow-up story on 28 July: 'Next-gen broadband at your service') looked at upgrading this architecture with network intelligence to facilitate the support of fixed-mobile convergence, multimedia and IPTV, or television transmitted via the internet, among others.

While the second phase offered enhanced services and integration, the first phase tackled the fundamental network issues. It was a big job.

"There was an obvious technology already available to improve metro and access networks," points out Vetter. "It was Ethernet, which was designed for IP networks and promised low cost because it was already widely used in data networks."

Serious problems

But serious problems existed with the technology. Ethernet was designed for local area networks with trusted users and lacked security when used in a public network. Also the support of Quality of Service (QoS), which is essential to handling multiple services, like voice and video, as well as the internet, a combination of services often referred to as 'Triple Play'.

"There were some fragments and different approaches out there, responding to some of these problems," says Vetter. "But the real issue was to develop consensus around a complete solution."

Thanks to good pre-standardisation studies and consensus building, MUSE made many contributions to the standards at the DSL forum,

ETSI-TISPAN, Home Gateway Initiative, and ITU-T, the relevant official standards bodies.

This led to a set of specifications and standards for Ethernet-based metro, access, and home networks with enhanced quality of service, security and bandwidth. Altogether, the architecture is the GSB.

Though the most visible result of this work is the upgrades of DSL networks for Triple Play and their increased deployments, the generic architecture and platform technology apply to all of the main and emerging access technologies, like fixed wireless and optical fibre.

Just the beginning

“Eventually all networks, including cable networks, will evolve to optical fibre, that will be the standard physical technology. And it is already happening: fibre is deployed in France, Sweden and other countries. But in the meantime, the most widespread technologies, DSL and fixed wireless, can move to GSB.”

And this is just the beginning. The fundamental architecture is in place with MUSE phase I finished in February 2006. Now phase II has started with the intention of developing the enhanced services enabled by the GSB architecture.

But two years after completion of the first phase, its results are already responsible for faster, better broadband near you, sooner than anyone expected.

This article is part one of a two-part feature on MUSE.

ICT Results