



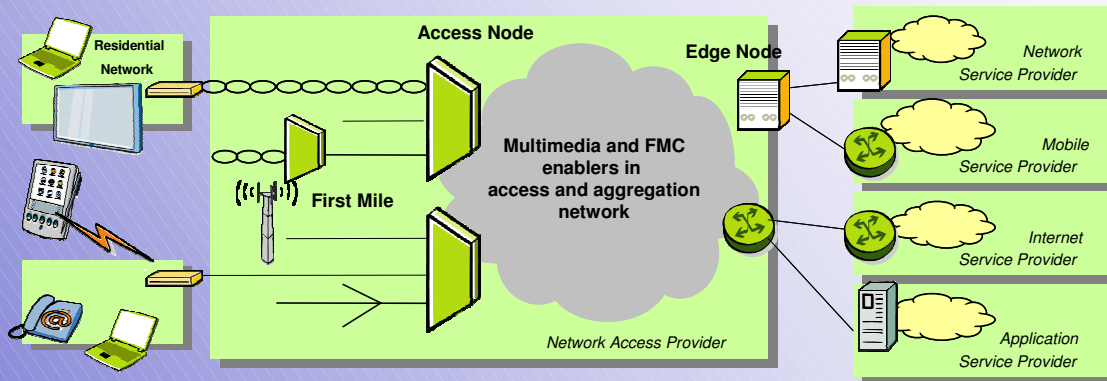
Multi Service Access Everywhere



*Information Society and Technology
6th Framework Programme
Strategic Objective "Broadband for All"*



MUSE covered the research and development of a future, low cost, multi-service access network. The access network should provide secure connectivity between end-user terminals and edge nodes in a multi-provider environment. It should be suited for the ubiquitous delivery of broadband services to every European citizen.



The integrated project addressed the network architecture, access and edge nodes, first mile solutions and interworking with the home network.

In **Phase I** during 2004-2005, MUSE defined a general multi-service access architecture and successfully realised three lab trials.

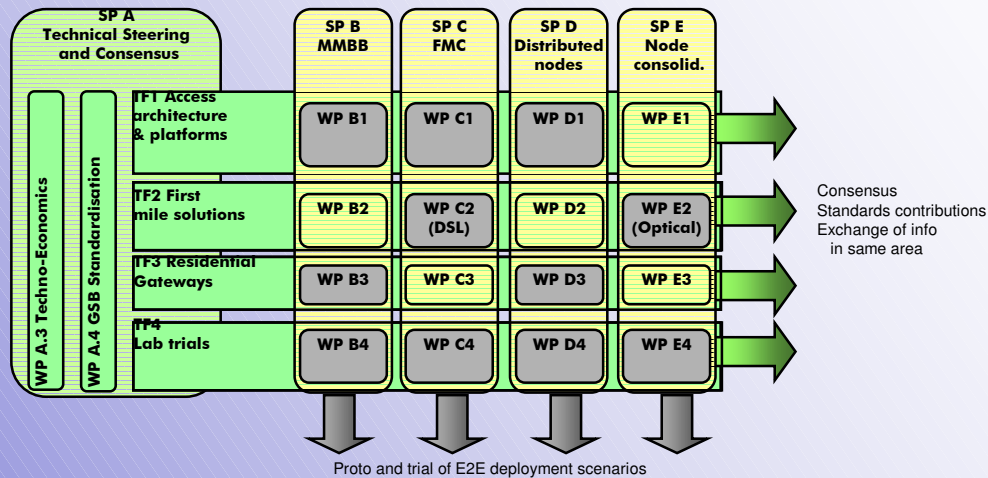
In **Phase II** during 2006-2007, MUSE enhanced the access network by embedding more service intelligence, preparing it for the support of fixed mobile convergence, and comparing new architectural concepts.

MUSE was organised in a matrix with Task Forces and Subprojects.

The **Task Forces (TF)** in MUSE addressed studies of common interest and involved experts in a same technical area from all subprojects. The task forces were aiming at a consensus about the reference architecture and requirements. Deliverables and white papers with the outcome of the task forces are available about the following topics:

- ▶ Generic access architecture (addressing e.g. quality of service, authentication, business models)
- ▶ Multimedia rich architecture (distributed service intelligence, quality of experience)
- ▶ Fixed mobile convergence architecture (nomadic services, session continuity, roaming between fixed and mobile providers)
- ▶ First mile solutions (DSL spectral management, noise modelling, zero-touch service provisioning for remote VDSL nodes, optical access)
- ▶ Residential gateways (multi-play gateway model, remote management by multiple providers)
- ▶ Lab trials and testing (common specification of test objectives and methods, cross subproject trials).

The partners in each task force made co-ordinated contributions to DSL Forum, ETSI, HGI (Home Gateway Initiative), and ITU-T.



The **Subprojects (SP)** in MUSE elaborated detailed solutions in line with the common specifications provided by the task forces and integrated them in end-to-end lab trials. Each subproject gathered a subset of partners and was focused on a specific deployment scenario. Subprojects were further organised in Work Packages (WP) according to the same areas as the Task Forces.

Subproject A was an umbrella that co-ordinated the technical direction and standardisation strategy. It also evaluated the techno-economic feasibility of studied concepts.

Subproject B aimed at solutions for **multimedia rich access**. In phase I, an IP forwarding access network architecture that supports migration from a legacy network was realised. In phase II, higher layer service intelligence was embedded in multi-service edge nodes and in access nodes by means of a service plane concept. The residential gateway developments concentrated on the support of multi-play capabilities and remote management by multiple providers.

SPC focused on capabilities for **fixed mobile convergence** from a fixed network perspective. A lab trial of multi-service, multi-edge Ethernet access network was integrated in phase I. In phase II, the platform was enhanced in order to support nomadic services and session continuity. A DSL loop qualification and monitoring tool was studied and integrated with the subproject's network and service management platform.

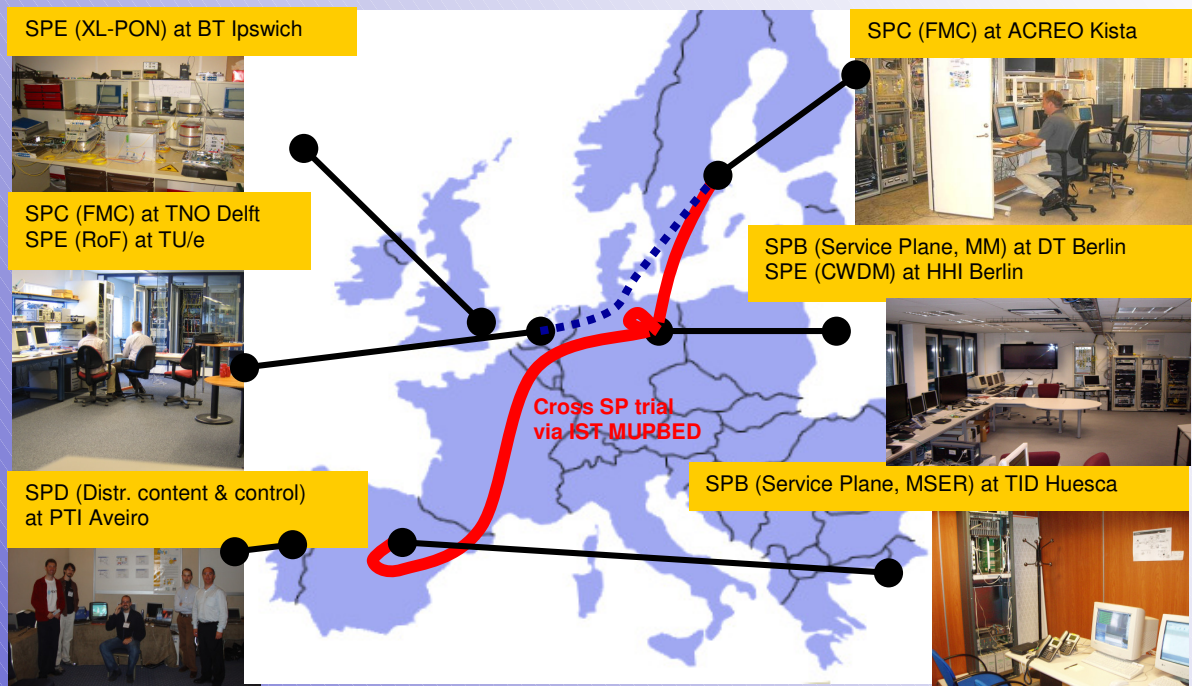
SPD dealt with **distributed high speed access architectures**. It first developed high bandwidth access solutions based on fibre in phase I. The resulting lab trial platform formed the basis to evaluate the distribution of various functions into the access, such as self-organisation and content caching. The subproject also realised a mock-up of a residential gateway suited for operation at high speed.

SPE investigated solutions for **node consolidation**. An XL PON (eXtra Large Passive Optical Network) multiplexes the signals from many subscribers by an amplified optical splitter, which is connected via an optical feeder to the edge and replaces the conventional access node. Also other optical access technologies such as CWDM (Coarse Wavelength Division Multiplexing) and RoF (Radio over Fibre) were addressed.

Deliverables and white papers of the TF and SP can be requested via www.ist-muse.eu.



MUSE Lab Trials



Vendors	Operators	Research Institutes
Alcatel-Lucent ERICSSON Nokia Siemens Networks Infineon technologies ST THOMSON images & beyond	BT Telefonica &france telecom TeliaSonera TNO P T TELECOM ITALIA &tp BredbandsForeningen Åhus regionen	IBBT INRIA Budapest University (BUTE) ICCS/NTUA HHI Lund Institute of Technology (LTH) TU Eindhoven ACREO Univ. Carlos III de Madrid University of Essex Robotiker

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