

Project Achievements



Multilink Architecture for Multiplay Services



MARCH investigated both technical and economic aspects of multilink network, focussing on wireless solutions. The project has demonstrated new multilink technology particular useful for providing broadband real-time services deploying simultaneously several physical networks that may have limited individual capacity. The project resulted in solutions that improve user's quality of experience (QoE) through higher capacity and more robust connections.

Main focus

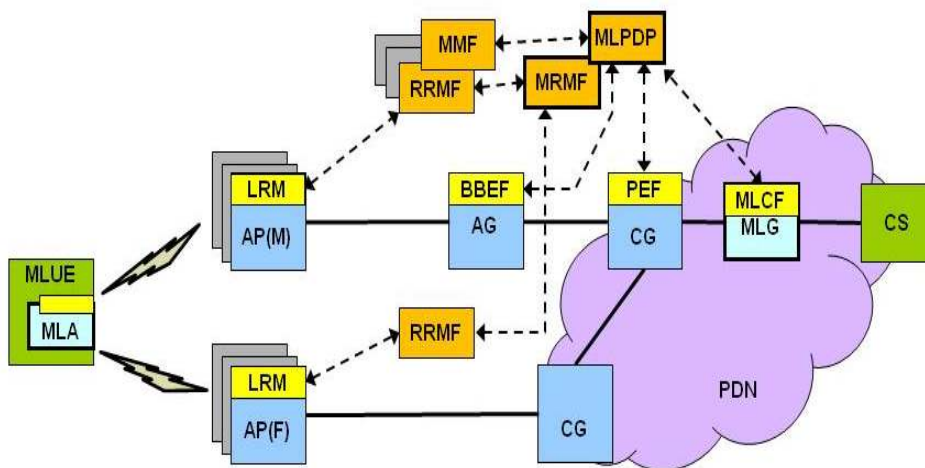
Broadband for everyone has been a major goal since more than a decade, and now mobile data is increasingly being the new service. Important drivers are video, but also other broadband content, media and traditional Internet browsing. Both fixed and mobile traffic are growing exponentially. Currently, mobile data grow twice as fast as the fixed. MARCH investigated and

suggested practical multilink scenarios, analysed market development until 2015, devised business models and presented quantitative analyses for some cases.

The combination of mobile data and wireless local area network (WLAN) are of particular interest, due to their widespread availability and the fact that many mobile terminals are available with the necessary physical interfaces included.

Approach

MARCH organised the work in five main areas: multilink network scenarios, business and economics of converged networks and services, multilink network techniques, multilink network architecture, and technical demonstrations. The work consisted of items requiring competence in telecom network technical aspects as well as end user behaviour, business aspect and markets. It was necessary to



UE – User Equipment
 AP – Access Point, (M – Mobile, F – Fixed)
 AG – Access Gateway
 CG – Core Gateway
 CS – Content Server
 MLG – Multilink Gateway
 MLA – Multilink (ML) Adaptor
 MLIC – Multilink Interface Controller

RRMF – Radio Resource Management Functions
 LRM – Local Radio AP Management
 MMF – Mobility Management Function
 MRMF – Multi RAN Management Function
 MLPDP – ML Policy Decision Point
 PEF – Policy Enforcement Function
 BBEF – Bearer Binding Enforcement Function
 PDN – Packet Data Network

MARCH

Project ID: CP5-013

Start Date: 1 June 2008

Closure date: 30 September 2011

Partners:

- Budapest University of Technology & Economics, Hungary
- Bitnet CCSS, Romania
- Gravity R&D Kft, Hungary,
- INDRA Sistemas SA, Spain
- LiveU, Israel
- Lividi, Norway
- Simula Innovation, Norway
- Technical University of Cluj-Napoca, Romania
- TELECOM-CLM, Spain
- Telenor ASA, Norway
- Telvent Global Services, Spain
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Project Websites

www.celticplus.eu/projects/celtic-projects/call5/MARCH/march-default.asp
<http://projects.celtic-initiative.org/MARCH/march/>

combine these types of skills to reach the project goals.

The business aspects made use of statistical information and knowledge from the partner's own markets to estimate the trends, in particular for Western Europe. Then forecast models were developed to show the broadband access trends and support of multilink usefulness for future access networks.

MARCH research provided multilink techniques and developed multilink network architectures. Part of this was demonstrated for services also addressed in economic analyses. The solutions were put into context of current international standardisation.

Achieved results

MARCH worked along two axes, market and business aspects of broadband access, and multilink techniques and architectures for heterogeneous multilink networks.

The main results from MARCH are:

- ◆ Economic and business assessment for multilink actors

The economic analyses results indicate it is possible to get positive business cases, such as a multilink network service providing higher bandwidth and more robust networks for an additional fee, or an operator bundling in multilink technology to increase network utilisation, provide better services

and serve more customers with none or small increases in the fee.

- ◆ Multilink network techniques

MARCH results make it possible to provide multilink applications as over the top of existing networks without any change to existing infrastructure; companies are already making business of this option.

- ◆ Multilink network architecture

The figure showing the MARCH reference multilink network architecture illustrates a combination of mobile and fixed wireless access points. Highlighted MARCH investigated network elements are multilink gateway (MLG) supporting splitting and merging per service data flow, multilink adaptor (MLA), multi radio access network management function (MRMF), and multilink policy decision point (MLPDP). One of the MARCH options is an improvement of the solution by the international standardisation organisation ETSI/3GPP.

- ◆ Public network and application demonstrations at several occasions addressing capacity increase, connection robustness, and scalability

The results of MARCH are both described in the literature, and deployed in new and existing products. Ideas have been contributed to the international standardisation organisations ETSI/3GPP and IETF.

Impact

MARCH results contribute to network operators understanding of the broadband market and hence allow them to more precisely target the roll-out of service and network. The result on business transitions between traditional ways of offering media, content, and telecommunication services enable operators to adjust the strategy for existing and new services. Multilink solutions allow operators to increase the return on investments.

New products are needed for both the terminals and the network. It will basically be software products, but can include hardware products for new releases, for example from ETSI/3GPP, including multilink technology such as split and merge of single IP flows.

Advanced network services, such as for emergency situations or education purposes, are possible allowing system companies to develop new business. Also new network capacity providers are possible providing quality of experience enhanced services on top of existing networks, for example in connection with major live events, e.g., bicycle race in a region or country. It is possible to set up new business with small investments.

The new knowledge allows academia to engage new doctor and master degree students, and develop new or update existing courses with first hand knowledge on multilink networking.

About Celtic

Celtic is a European research and development programme, designed to strengthen Europe's competitiveness in telecommunications through short and medium term collaborative R&D projects. Celtic is currently the only European R&D programme fully dedicated to end-to-end telecommunication solutions.

Timeframe: 8 years, from 2004 to 2011

Clusterbudget: in the range of 1 billion euro, shared between governments and private participants

Participants: small, medium and large companies from telecommunications industry, universities, research institutes, and local authorities from all 35 Eureka countries.

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