

Project Achievements



Mobile Networks Evolution for Individual Communications Experience

Mobile broadband networks are expected to face dramatic growth, up to 1000 times more, of user traffic for increasing popularity of data-hungry services. The radio systems LTE and LTE-Advanced, complemented with Wi-Fi systems, will provide high radio capacity to meet the need. Celtic project MEVICO studied the evolution of the Evolved Packet Core (EPC) networks to enable very high capacity mobile networks for the support of LTE-Advanced mobile networks.

Main focus

The main focus of MEVICO was to enhance and optimize the mobile core network, the EPC, to provide the sufficient capacity, intelligent resource utilization and service experience for the end-users in an economically efficient way. The two-node network architecture of an EPC network with IP routable transport architecture for the project baseline is shown in the figure. It consists of Mobility Management Entity (MME) for subscriber and mobility management and Gateways (Serving Gateway SGW, Packet Data Network Gateway PGW) for packet forwarding, The PCRF and HSS support the EPC with QoS & policy control and subscriber data storage respectively.

A full network and end-to-end view onto

the network evolution was adopted. For this, research for innovations in the following areas was carried out:

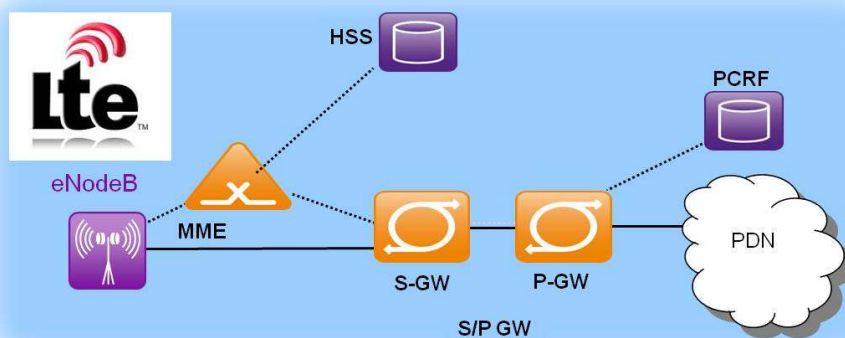
- ◆ Mobility management, routing optimization and protocols evolution
- ◆ Packet transport network technologies and architectures
- ◆ Traffic management methods and tools
- ◆ Network management methods and monitoring tools
- ◆ Cost models for network Capex and Opex

Approach

Each of the main research areas, performed conceptual research and the results were validated by simulations or prototype implementations. This resulted in a high number of technology proposals.

The architecture design followed a phased approach for guiding research and consolidating the research results. The technology proposals were compiled, evaluated and consolidated into the EPC network architecture.

The validation results, as well as the CAPEX/OPEX evaluation results, provided the basis for aligning and mapping the



Mevico

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Partners:

AALTO University/ School of Science and Technology (AALTO), Finland
Alcatel-Lucent Bell Labs France, France
Artelys, France
Avea, Turkey
Budapest University of Technology/ Mobile Innovations Center, Hungary
Commissariat à l'énergie atomique et aux énergies alternatives (CEA), France
Deutsche Telekom, Germany
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Montimage, France
Nokia Siemens Networks Oy, Finland
Nokia Siemens Networks GmbH, Germany
Nokia Siemens Networks Hungary, Hungary
O2 Germany, Germany
RAD Data Communications, Israel
Technische Universität Berlin, Germany
Technical University of Chemnitz, Germany
Turk Telekom, Turkey
University of Vienna, Austria
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Project Websites

www.celticplus.eu/Projects/Celtic-projects/Call7/MEVICO/mevico-default.asp

<http://www.mevico.org/>

technologies & solutions onto the system architecture. As the result, a total of 18 technologies were prioritized for the evolution of EPC by applying a set of Key Performance Indicators (KPIs). They are mapped onto the EPC network architecture, thus providing an Architecture Design as a consolidated project result.

Achieved results

The project developed system optimizations in four key areas for LTE mobile networks.

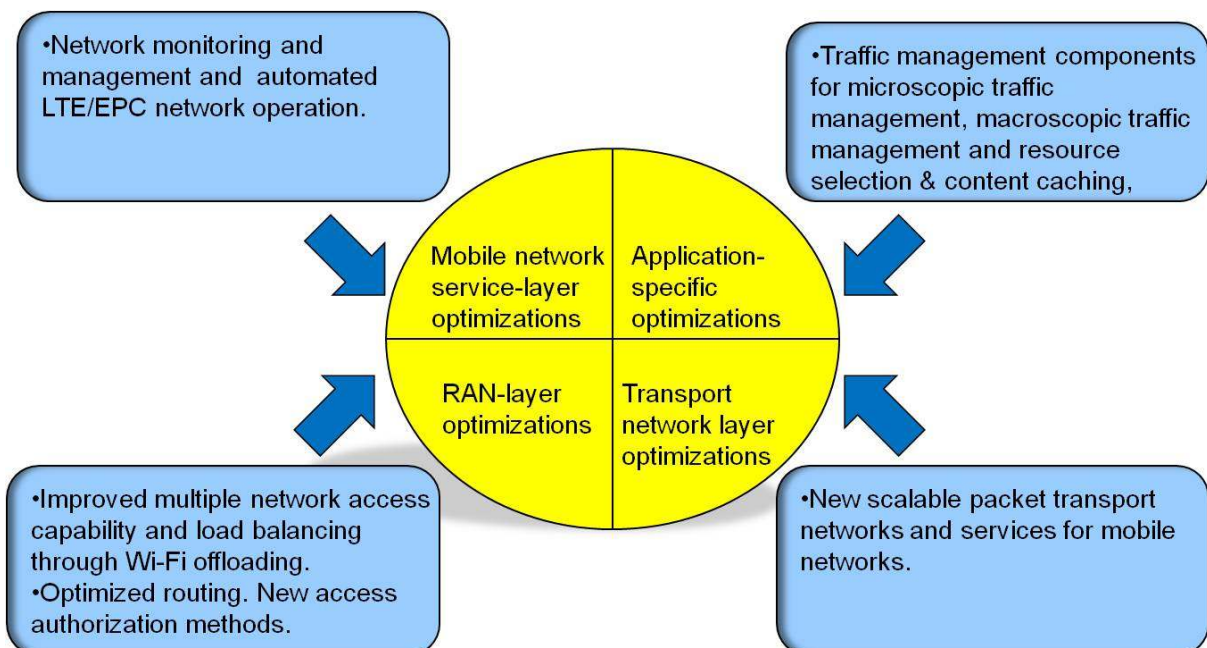
Demonstrated new solutions are:

1. Video Streaming QoE Monitoring Solution
2. Broadband Reporting Tool
3. IPTV and VoD QoE monitoring
4. Video server selection via ALTO
5. Ethernet-based mobile access network
6. Customer Edge Switching
7. Wireless Mesh Network (WMN) - small cell back-haul

8. Generic SCTP-based session layer for mobility
9. Operator Managed Wi-Fi Access Point
10. Host-based IP Mobility
11. Routing Optimization for Proxy Mobile IPv6

Impact

The project results have enabled development a total of 16 either new or improved products which are targeted for deploying mobile broadband networks infrastructures for LTE, as well as for planning, optimization and managing



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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the mobile networks.

The research results were used for standardization contributions to IETF and 3GPP.

A total of 21 prototypes and field trials were implemented by the Work Packages.

The innovations in the research results produced a total of 15 patent applications.

A number of PhD thesis (total 7) and Master thesis (total 16) contributed to and used the project results.

Project results have been internationally published in 9 journal publications and in 47 conference papers.