

# Project Achievements



## Integrated Multiservice Architectures for next Generation Services

IMAGES focused on the evolution of the network architectures in the IMS and NGN scenarios, specifically considering the Quality of Service (QoS) requirements. The project provided a general framework in which different modules (services and application, broadband network infrastructures) were integrated with an innovative Network Control layer. The framework gives the possibility to test innovative convergent multimedia services, controlling the network resources allocation for the different media streams that are associated to a service request.

### Main focus

Network architectures are in a continuous evolution, and thanks to the widespread availability of broadband access, many innovative enhanced services are offered to IP-based endpoints. End users wish to obtain enhanced services, easy to be used, combining different media sources. Therefore, we have different kinds of services, with different requirements in terms of QoS and implemented using different signaling protocols.

Within the IMAGES project these issues were addressed and to overcome the existing limitations a Network Control layer able to provide network resource management was designed and prototyped. This layer is in charge of correlating specific service requirements and network

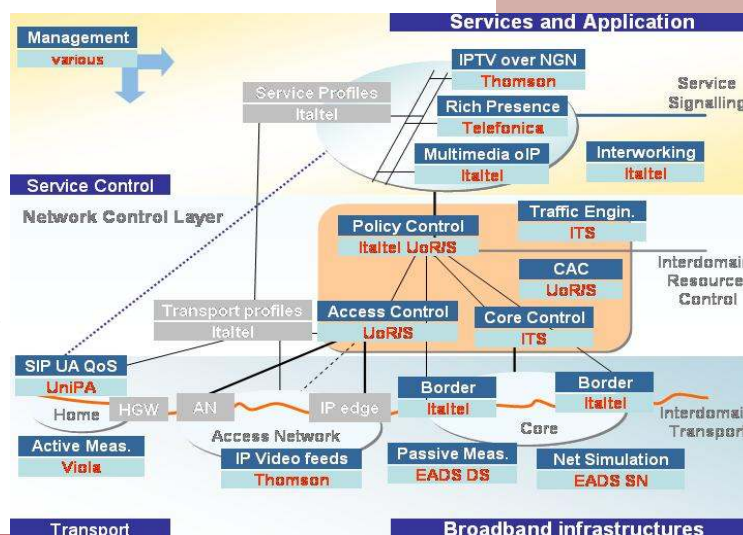
resources allocation. IMAGES also took into account several related issues, starting from techniques acting at transport layer that can improve QoS, with specific reference to the IPTV service and to QoS measurements techniques. The IMAGES approach considered also interoperability, service signalling interworking and service signalling improvements.

### Approach

The project provided a general framework (shown in the figure) in which different modules for the Services Control layer and for the broadband network infrastructure were integrated. These modules gave the possibility to test innovative services within the framework while additionally providing specific improvements in the service area.

The framework was conceived for convergent network architectures, composed of different network domains.

The project focused in depth on the network control architectures needed for controlling the different media streams



## IMAGES

Project ID: CP1-029

Start date: 1 July 2004

Completion date: 1 July 2007

### Partners:

EADS Defence and Security Systems, France

EADS Secure Networks, France  
Italtel, Italy

ITS - Information Technology Services, Italy

Telefónica I+D, Spain

Thomson, France

University of Palermo, Italy

University of Rome, Italy

University of Sannio, Italy

University of Valladolid, Spain

Viola Networks, Israel

### Co-ordinator:

Giuseppe Monteleone

Italtel, Italy

E-mail: giuseppe.monteleone@italtel.it

### Project Website

<http://projects.celtic-initiative.org/IMAGES/>

that are associated to a service request. Within the project it was possible to demonstrate how to achieve end-to-end interoperability in NGN providing the control of network resources.

At the Service Control layer the impact of innovative services in terms of requirements of network resources was investigated. Specific innovative services in the multimedia domain were used for experimentation (Multimedia over IP: session-based and content-based applications and services, enhanced Presence Service, IPTV services, QoS aware SIP UA).

At the Network Control layer it was investigated how to optimize the network resources utilization being able to fulfil specific service requirements (Policy Control, Access and Core networks Control, Traffic Engineering, Connection Admission Control, Resource Management algorithms).

## Achieved results

The Network Control layer was addressed from both a theoretical standpoint and an experimental approach. Experimentation was performed both for the resource management algorithms designed

and for the network architecture. The modules composing the architecture were implemented by the different partners (developing the Network Control Layer modules, such as the Policy Decision and the different Control Functions for the access and the core networks performing adaptive control algorithms). A preliminary "proof of concept" was performed, and a fully functioning prototype was developed. Network simulations and the prototypes were used to demonstrate the validity and the feasibility of the approach.

Considering the state of the art at the project starting date and also the recent achievements, it is possible to highlight the innovative aspects of the IMAGES approach and specifically the innovation in the designed network architectures. In particular, we can remark the Interdomain approach to achieve end-to-end resource management control; the introduction of the functional elements controlling the core network; the usage of the evolutionary resource management algorithms; the independence from the signaling network and the unified approach regarding service typology.

Other achievements are the prototype of the SIP Interworking function and the Control of Border Gateways to be performed at the border of different networks, QoS aware SIP UA, innovative SIP-based multimedia service, active QoS and passive QoS measurements.

IMAGES members took part in many dissemination and standardization activities to promote the IMAGES approach. Project results were presented at many congresses (Celtic Events, IEE 2005, SMAU 2006, IEEE ICCE, SMPTE, SIPit, etc.).

## Impact

The increase of knowledge in the observed domain has generated a great impact in terms of new commercial offerings and in product innovation.

In fact, new products and better products are going to be developed starting from the IMAGES prototypes and the partners have the possibility to deploy new network solutions. The partners have gained important knowledge in development and integration of innovative network architectures.

Italtel is active with a series of products in the IMS and NGN scenarios, new features are going to be available and new products are scheduled in the near future thanks to the IMAGES project. Thomson has enhanced their offering for the IPTV. Telefonica has achieved the possibility of new commercial offers.

Another important impact of the project was that the participants have increased their knowledge and their skills. Partners are convinced that the IMAGES approach will be the foundation for the new network architectures. New projects initiatives are going to start so to extend and improve the project results.

## 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.

## Celtic Office

c/o Eurescom, Wieblingen Weg 19/4,  
69123 Heidelberg, Germany  
Phone: +49 6221 989 405, e-mail:  
office@celtic-initiative.org  
www.celtic-initiative.org

