

## Integrated Multiservice Architectures for next Generation Services

**IMAGES focuses on network architectures and signalling protocols for controlling media streams. The goal is to achieve end-to-end interoperability in Next Generation Networks, providing Quality of Service control and security. The project integrates results provided in related areas and considers network solutions in which multimedia softswitches play the main role in network resource control and allocation.**

### Main focus

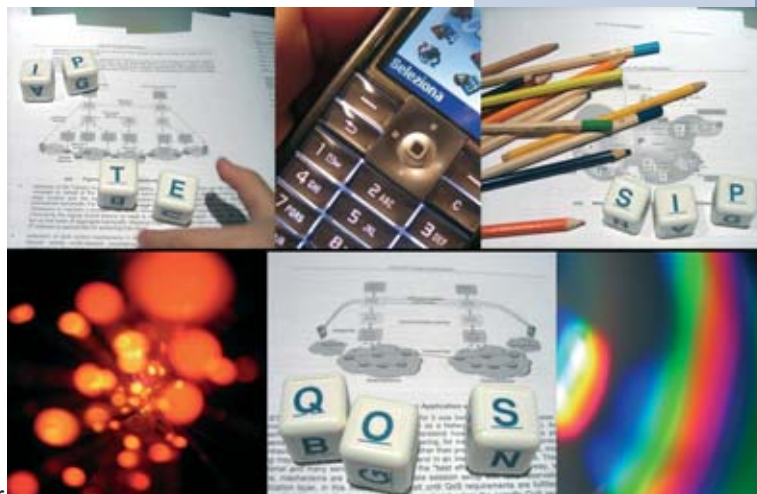
Moving towards Next Generation Networks (NGN), many limitations remain unsolved. They are related to Quality of Service (QoS) requirements, bandwidth availability, and, generally, to enhanced services interoperability. These limitations constitute a serious drawback for the quick deployment of the new technologies.

The factors limiting widespread availability of Next Generation Services are mainly due to the different mix of network solutions that will coexist in the near future. They are also related to the work in progress and the consequent evolution in the design of net-

work architectures and in the protocols area. Many applications based on the ITU-T multimedia standard H.323 are already in operation, while SIP is emerging as the protocol for implementing next generation services. It is clear that interoperability is a great issue, which affects not only call/session control signalling but also end-to-end QoS signalling and Service Level Agreement (SLA) management.

These items are of great importance for a timely deployment of services that are now achievable thanks to the open service architectures and programmable platforms. There is also a strong need for integrated management techniques in order to realize a commodity pricing based on QoS. It will be required to establish media streams according to precise QoS requirements with the opportunity

to change them during the call or session mapping them into QoS classes, ensuring end-to-end negotiation.



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### Partners

EADS Telecom, France  
Thomson, France  
Italtel, Italy  
ITS - Information Technology Services, Italy  
University of Palermo, Italy  
University of Rome, Italy  
University of Sannio, Italy  
Viola Network, Israel  
Telefónica I+D, Spain  
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### Project web site

[www.celtic-initiative.org/projects/impulse](http://www.celtic-initiative.org/projects/impulse)

## Approach

IMAGES aims at analysing, designing and developing innovative network solutions at prototype level in accordance with the Converged Network concept. This concept is defined as the possibility to unify "classical telephone network, mobile networks and the Internet in a single infrastructure, which offers Quality of Service (QoS) and high reliability" (Celtic Purple book).

IMAGES starts from the NGN model, which is based on the decoupling of services and networks, allowing them to evolve independently in a seamless fashion.

Within NGN, all the applications will converge to a broadband access based on the Internet Protocol (IP). In this scenario the previous networks architectures will be gradually replaced with open and distributed solutions based on the separation between service logic and the transport infrastructures. As a consequence, IP based Multimedia systems will be the means to handle communication sessions using the packet-switched domain. Application servers will be the key elements in providing the service logic and execution for a number of enhanced services. The main strategic relevance in the NGN area is related to a widespread deployment of NGS (Next Generation Services) and to the fulfilment of the expectations for a timely market availability of these enhanced services.

## 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 the only European R&D programme fully dedicated to end-to-end telecommunication solutions.

**Timeframe:** 5 years, from 2004 to 2008

**Cluster budget:** in the range of 1 billion euro, shared between governments and private participants

The IMAGES approach consists in controlling multimedia flows specifying and monitoring the required bearer QoS classes. To achieve this purpose it is necessary to investigate and design network architectures and the related control signalling procedures in order to fulfil the requirement coming from Next Generation Services, providing QoS and optimising the resource management issues.

## Main results

This project is based on a convergence approach, which takes into account IP multimedia on fixed networks as well mobile and future wireless services.

The main achievements and main results to be expected from the project will be related to the design and prototyping of an intermediate "network resource control" level, in order to manage, from the service domain, the transport domains involved in a session. This will allow specifying and monitoring the required bearer QoS classes.

Particularly, this project is aimed to design and prototype session control policies with the following objectives:

- Bandwidth management with the ability to determinate if a new session can be established, according to QoS requirements supporting mechanisms to determine if the e2e QoS classes preferences can

be fulfilled given the present level of resource availability;

- QoS signalling mechanism through inter-softswitch message exchanging, capable to cover inter-domain environments considering both a per call/session basis approach and per SLA and static pre-provisioning;

- Session control signalling inter-working and adaptation (with reference to SIP and H.323 video communications in separate service/transport domains);

- Inter-working mechanisms with "network resource control" level (control mechanism for middle-box, control mechanism for QoS control).

The project aims also at analysing the convergence between "session-based" and "content-based" services. Therefore, a specific effort is devoted to the technology for enabling Broadband IP Television over NGN.

Besides, the project will define and prototype the traffic engineering and QoS routing techniques needed to achieve the desired optimisation in network resources usage, while respecting the QoS requirements.

## Impact

The IMAGES project will enable telcos to add value to their networks by creating new opportunities for deploying advanced services.

New opportunities will arise from the full exploitation of convergence and from a large number of applications, which will be available thanks to the widespread use of IP-based networks.

Quality and security issues for real-time services and video streaming over IP networks must achieve comparable levels as for public switched telephone networks (PSTN).

In this scenario QoS is often seen as an opportunity for generating revenue for service providers. Needless to say, it is also a necessity for guaranteeing service availability at satisfactory level. This justifies the investments needed to handle the problem in NGN. Furthermore, service accessibility must be ensured from different networks, thus allowing different service providers to obtain a widespread use for new applications.

**Participants:** small, medium and large companies from the telecommunications industry, universities, research institutes, and local authorities from 33 countries

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