

Wireless Systems providing high QUALity Services

WISQUAS aims at playing a key role in providing the enabling technologies for the future wireless multimedia communications. This will be achieved by conceiving excellent fast physical layers as well as appropriate higher layers, which can bring the best possible performance out of the physical layers for providing services at minimum power and cost.

Main focus

The WISQUAS project aims at enabling multimedia services in future wireless networks. On the one hand, wireless bandwidth is a scarce resource. On the other hand, users want terminals to be light and consume minimal power. Within these constraints, a wide variety of multimedia services are desired. Thereto, current wireless systems need to be upgraded to offer:

- Higher data rates
- More flexibility
- Quality of Service (QoS) provisions
- Low energy operation and low power consumption
- High integration

To fulfil these needs, innovative research will be performed and demonstrated on the following topics:

- System specification and innovative design flow to allow cross-layer optimisation
 - Advanced physical-layer air interfaces, featuring flexibility, scalability, adaptivity, high capacity and bandwidth efficiency
 - Advanced protocols and architectures for QoS at higher layers
 - System integration and validation
- Low-energy and low-power consumption will be mainly investigated through functional models and across several communication layers.



W^(*)ISQUAS

WISQUAS

Project ID: CP2-035

Start Date: 1 May 2005

Completion date: 1 May 2007

Partners

Belgacom, Belgium

CEA - LETI, France

CTTC - Centro Tecnológico de Telecomunicaciones de Catalunya, Spain

IMEC - Interuniversitair Micro-Electronica Centrum, Belgium
Instituto de Telecomunicações, Portugal

Inventel (Thomson), France

Mitsubishi Electric ITE-TCL, France

Motorola SAS, France

SETELSA, Spain

Universidad de Cantabria, Spain

Université Catholique de Louvain, Belgium

Universiteit Gent, Belgium

Wavecom, Portugal

Co-ordinator

Sébastien de la Bastie

Inventel (Thomson), France

E-mail:

sebastien.delabastie@thomson.net

Project web site

www.celtic-initiative.org/projects/wisquas

Approach

WISQUAS will make substantial enhancements to the state of the art in mobile technology and wireless connectivity. It will produce disruptive new algorithms and protocol solutions with a view at the entire communication stack. WISQUAS will provide a thorough methodology that will guide the designer from service and user definitions towards system specifications.

It will enable mobile multi-media terminals capable of adapting their internal radio resources to suit the particular quality of service being requested at the time, and featuring the possibility to high-data-rate and mobility-using techniques, such as diversity and MIMO (multiple input multiple output).

The terminals will achieve levels of adaptive quality/power far beyond the current state of the art.

Intentionally, this project reuses existing platform architectures developed in earlier European projects to maximize the focus on novel algorithm, protocol, and methodology development. A parallel MEDEA+ proposal will investigate architectural and hardware design aspects for next-generation platforms and terminals. The project is organised in two phases:

🌐 In the first phase, WISQUAS will clearly focus on the development of new functionality and, through the reuse of existing platforms from earlier European projects, minimize the design effort to prove algorithmic and protocol concepts in realistic B3G scenarios.

🌐 In a second phase, WISQUAS may integrate the results of the first phase on algorithms and protocols and the results on more efficient, optimised platforms from MEDEA+.

Main results

The expected main results of the WISQUAS project are three-fold:

🌐 The validation and introduction of new air interfaces designed for realistic B3G scenarios is crucial to meet multimedia multi-modal communications of the user. These new air interfaces will easier adapt to realistic scenarios and services than existing solutions through the development and introduction of advanced algorithms and advanced protocols.

🌐 Cross-layer exploration improves system performance/cost at the expense of a more complicated design phase. WISQUAS will come up with a sound methodo-

logy for a systematic evaluation and optimisation of algorithms, protocols, and architectures.

🌐 The introduction of novel algorithms and architectures requires a careful validation on realistic platforms. A proof-of-concept phase using several existing platforms will make sure that the new algorithmic and protocol concepts represent indeed valuable solutions for realistic B3G scenarios.

Impact

New wireless technologies will touch every aspect of people's lives and will impact what people use (mobile devices, cars, home devices, etc.), the networks that connect user interfaces (GSM, GPRS, UMTS, Bluetooth, WLAN, UWB, satellite networks, etc.), the systems that will provide usefulness and efficiency (application servers, e-commerce platforms, middleware technologies or more accurate location sensing capabilities). The challenge clearly resides in the seamless integration of these different technologies to offer end-users a high performing end-to-end experience. The demand of mobility in conjunction with higher data rates and spectrum efficiency still requires huge R&D investments.

Funding R&D projects in the area of mobile multimedia, such as WISQUAS, will enable European market leaders to play a significant role in upgrading the standards to deliver the required quality of service for mobile multimedia at minimum power consumption.

Technologies developed by WISQUAS will target the wide wireless community, as the technology will support backward compatibility to a variety of existing and emerging air interface standards.

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
- Participants: small, medium and large companies from the telecommunications industry,

universities, research institutes, and local authorities from 33 countries

CELTIC Office

c/o Eurescom
Schloss-Wolfsbrunnenweg 35
69118 Heidelberg, Germany
Phone: +49 6221 989 372,
e-mail: office@celtic-initiative.org
www.celtic-initiative.org

