

# GOLLUM

## Generic Open Link-Layer API for Unified Media access

**KEYWORDS:** link-layer API, link-layer triggers, operating system independent, cognitive radio support

### Introduction

The GOLLUM project aims at studying and creating key parts of an embedded, open, operating system independent link-layer API to unify the various methods for accessing different wired and especially wireless links. The aim is to remedy the current, very difficult situation where a separate programming interface exists for almost every wireless technology. The existence of such an API and corresponding middleware would greatly improve interoperability between various technologies. It would enable better portability of applications between devices using different, usually wireless, communication interfaces.

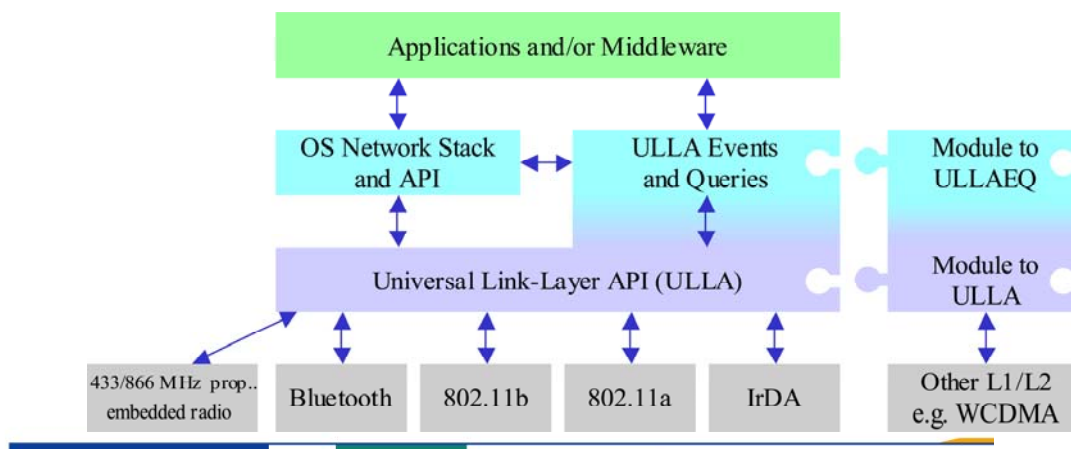
### Objectives

The GOLLUM API is aimed to simplify the wireless access programming as seen by programmers, and same time providing more flexibility and new features for innovative application. This would potentially enable operators and software vendors to provide new kinds of services and greatly enhance the user experience. Applications could properly adapt to

changes in the network connection, allowing for smart applications to be developed. An API of this type is also a building block for middleware and embedded systems for intelligent, networked devices. The project will provide not an openly available API specification, but also is doing practical, partial prototype implementations on various commercially viable technologies and different operating systems.

### Expected Results

- A solution to the complexity and interoperability problem related to the large number of different APIs and methods used for accessing communication interfaces, especially in the embedded domain.
- Providing triggers, handles and APIs for different smart, context sensitive and link/network aware applications, enabling the development of “cognitive applications”.
- A solution to the abstraction and extensibility problem related to different underlying wireless interfaces and networking technologies.
- Design and in part implementation of a solution to hide the embedded



communication network problems from the middleware, application and operating system programmers.

- Results will be applicable to, for example, wireless controls, industrial processes, automotive applications, mobile and wireless terminals etc.
- A wireless interface description method that can be used as a tool and as a framework for presenting and extending the API support for current and future wireless interfaces.

## Partners and their role

The university partners RWTH and UC have a substantial collection of WLAN and WPAN related equipment and technology as well as experience with both Linux and Windows-based platforms that will be leveraged during the project. RWTH will also make its sensor network testbed available to the project

EMIC/MS will use Windows-CE and Pocket-PC as the main development and target platforms. MS has also access to SmartPhone kits and hardware at the intimate level.

STM has developed an embedded platform called "Nomadik", which is a multimedia oriented system-on-chip targeting the mobile multimedia market with an adapted the Linux OS. The platform can use WLAN or Bluetooth cards.

TID will provide access to 2.5G and 3G networks by providing SIM-cards to the consortium for testing and prototyping purposes. The testing can be done by using PC-daticards in Windows and Linux.

TREL has been working on an open reconfigurable protocol stack framework that supports dynamic insertion and configuration of protocol components. It supports a configuration management framework and platform (operating system) independence is provided by a lightweight virtual operating system concept.

MA has an extended test-environment for their SMS and MMS infrastructure solutions and service portfolio. This testbed includes access routers for CSD dial-in, connectivity to the German GPRS networks, interfaces to the signaling networks of the mobile operators and a highly scalable load-testing environment.

## GOLLUM

### CONTRACT NUMBER

IST – 511567

### FULL NAME

Generic Open Link-Layer API for Unified Media access

### TYPE OF PROJECT

Specific Targeted Research Project

### PROJECT PARTICIPANTS

Rheinisch-Westfaelische Technische Hochschule Aachen (RWTH) Germany  
Europäisches Microsoft Innovations Center GmbH (EMIC), Germany  
Universidad de Cantabria (UC), Spain  
STMicroelectronics S.r.l.(STM), Italy  
Telefonica Investigacion y Desarrollo Sociedad Anónima Unipersonal (TID), Spain  
Toshiba Research Europe Ltd (TREL), United Kingdom  
Materna GmbH Information and Communications (MA), Germany

### CONTACT PERSON

Prof. Petri Mähönen  
Department of Wireless Networks  
RWTH Aachen  
Kackertstraße 9  
D-52072 Aachen, Germany  
Tel: +49 (2407) 575-7032  
Fax: +49 (2407) 575-7050  
Email: [pma@mobnets.rwth-aachen.de](mailto:pma@mobnets.rwth-aachen.de)

### PROJECT WEBSITE

<http://www.ist-gollum.org>

### BUDGET

Total cost: 3 MEuro  
Funding: 1.8 MEuro

### TIMETABLE

Starting date: 1. September 2004  
Duration: 24 months

This project is part of the portfolio of the

Embedded Systems Unit – C3  
Directorate General Information Society

For more information please check:

[http://www.cordis.lu/ist/directorate\\_c/ems/](http://www.cordis.lu/ist/directorate_c/ems/)