# UMA Testing Facility

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**Abstract.** UMA (University of Malaga) is developing a testing facility to provide support for the complete development process of Internet services in mobile networks. The platform enables the execution of data services on instrumented mobiles and will offer a remote access to carry out unattended measurement campaigns in commercial and emulated cellular networks. The facility mainly targets data connectivity and performance over cellular networks (GSM, GPRS, UMTS, HSPA and LTE), mobility procedure analysis, IP traffic monitoring, energy consumption and location.

**Keywords:** cellular networks, performance measurements, quality of service, experimental testbed.

## 1 Introduction

In this paper we introduce the experimental testbed implemented by our research group[1] to carry out mobile experiments in a real context and to extract the correlation between radios access configurations and QoS parameters perceived at the application level. The execution of exhaustive measurements campaigns using this testbed will enable the identification of specific performance counters and used cases for QoS and QoE optimization in mobile networks [1].

Concretely UMA testbed is expected to be used in the following scenarios:

- to measure KPI (Key Performance Indicators) related to radio access, applications performance and QoS perceived by final users
- to support the testing of new radio access configurations
- to deploy experiments in live cellular network to test the performance of new services, applications and mobile application protocols
- to evaluate the performance of LTE as radio access technology in FI-PPP scenarios.

## 2 Testbed Configuration

As we can see in Figure 1, the testbed include an eNodeB emulator which provides high performance protocol and radio capabilities to emulate a LTE access

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network, COST mobile devices where new applications, services and protocols can be deployed, servers for deploying services, monitoring tools and post-processing facilities.

The emulator supports the connections of real LTE devices and the transport of IP traffic generated by commercial applications.It also includes features such as emulation of channel propagation that allows modeling fading and additive white gaussian noise impairments and configuration of cell load, in addition to a high degree of configurability of the LTE stack. The COST devices includes monitoring tools developed by UMA. The monitoring software is available for Symbian [2], Android[3] and Blackberry OS platforms. Current functionality focuses on the monitoring of network parameters, data traffic, battery and location. Mobile devices can be connected to commercial cellular networks deployed in Spain or to the LTE base station emulator.

Post-processing tools available at the UMA facility enable the testing and identification of IP connectivity issues in cellular connections, objectives and subjective performance parameters.

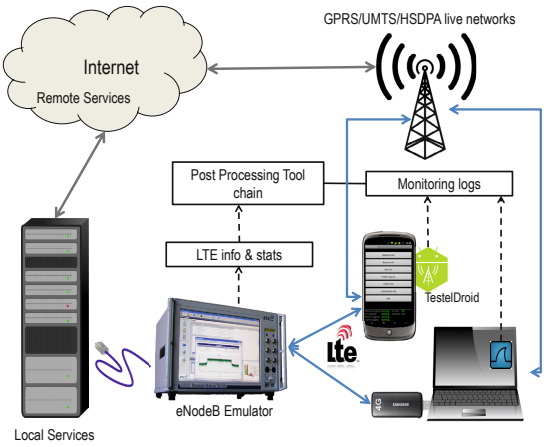


**Fig. 1.** UMA testing facility setup

## References

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