LabSMILING

A framework, composed of a remotely accessible testbed
and related SW tools, for analysis and design of low data-rate wireless personal area
networks based on IEEE 802.15.4

Marco Santic*[+], Luigi Pomante*, Walter Tiberti*, Carlo Centofanti*, Lorenzo Di Giuseppe*

*Center of Excellence DEWS, Università Degli Studi Dell'Aquila, ITALY
[+] Main contact: marco.santic@univaq.it

Introduction

Low data-rate wireless personal area networks (LR-WPANs) are even more present in the fields of IoT, wearable devices and health monitoring. The development, deployment and test of such systems, based on IEEE 802.15.4 standard (and its derivations, e.g. 15.4e), require the exploitation of a testbed when the network is not trivial and grows in complexity.

This demo shows the framework of LabSmiling: a testbed and related SW tools that connect a meaningful (but still scalable) number of physical devices (sensor nodes) located in a real environment.

The framework offers the following services:

- program, reset, switch on/off single devices;
- connect to devices up/down links to inject or receive commands/msgs/packets in/from the network;
- set devices as low level packet sniffers, allowing to test/debug protocol compliances or extensions.

Advanced services are:

- possibility of design test scenarios for the evaluation of network metrics (throughput, latencies, etc.);
- custom application verification.

Goals

The main goals of this demo are to describe the proposed *LabSMILING Framework* and to show its application by means of some basic examples.

Demo description

This demo illustrates the architecture of the remotely accessible testbed (fig.1), describing and putting in evidence the elements that compose the whole system. The basic services present on a Gateway element are discussed (fig.2), giving the audience the possibility to understand the capabilities of the framework. On the client (or final stakeholder) side, it is shown how it is possible to use the service elements to program motes, to get and view their output, and to compose testbed configurations by the use of scripts (fig.3). Basic examples for network throughput evaluation are illustrated.