Semester Thesis:

A Protocol Gateway for the Internet of Things

Motivation and Informal Description:

The Low-power Wireless Bus (LWB) [1] is a state-of-the-art protocol that provides robust and energy efficient data dissemination through arbitrary multi-hop wireless sensor networks. The unique properties of the LWB make it ideal for supporting the low-power communication demands of emerging Internet of Things (IoT) applications. However, in order to provide interaction between the wireless sensor network and the end-user, a protocol gateway between the LWB and a smart-phone compatible communication interface, such as the BlueTooth Low Energy (BLE) protocol stack, is needed.

The goal of this semester thesis is to design, develop and evaluate a protocol gateway that supports the exchange of messages between the LWB and BLE protocol stacks. The proposed system architecture is illustrated in Figure 1. Message exchange between the LWB and a BLE-enabled processor is facilitated by the recently developed BOLT processor interconnect [2].

Your Project: Your tasks of this thesis will include the selection of an appropriate BLE-enabled development board, interfacing the module to the BOLT processor interconnect, and the implementation of message exchange between the LWB and BLE protocol stacks. You will then validate your approach using a BLE-enabled smart-phone and evaluate your prototype using appropriate performance metrics. If time permits and motivation is high, a custom PCB for your BLE module may be designed and manufactured.

Requirements: You should be highly motivated, have experience with embedded system programming in C, familiarity with the SPI interface, and be comfortable working with lab equipment such as oscilloscopes and logic analyzers.

Interested? Please have a look at http://www.tec.ethz.ch/research.html and contact us for more details!

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References: