Open Thesis / Project

Linux Kernel support for a Low-Cost Power Analyzer Tool

Motivation
Power analyzer tools are helpful to evaluate the performance of low-power embedded systems, as they allow a quantitative in-depth understanding of the energy-efficiency of communication protocols and hardware platforms. Commercial power analyzer tools are, however, quite expensive. When analyzing large-scale systems such as wireless sensor networks or Internet of Things applications, the use of several power analyzers becomes a very expensive endeavor. For this reason, at our Institute we have built D-Cube, a prototype platform to monitor current and voltage of low-power embedded systems with minimal costs. The prototype consists of a Raspberry Pi 2 or 3 and a TI LMP92064 module (see http://www.iti.tugraz.at/D-Cube/). Our goal is to optimize the hardware and software of our prototype in order to build an inexpensive power analyzer tool for the IoT that can be mass-produced and installed on a large-scale.

Thesis Type
Bachelor Thesis / Master Project.

Target Group
- Students of ICE/Telematics;
- Students of Computer Science;

Goals and Tasks
- Development of a kernel module/driver for the LMP92064;
- Test the driver on Raspberry Pi 2 and/or 3, as well as on newer hardware platforms (Orange Pi or similar).

Required Prior Knowledge
- Good programming skills (C/C++);
- Solid knowledge of Linux kernel and low-level development is a plus.

Used Tools & Equipment
- Raspberry Pi 2, Raspberry Pi 3, Orange Pi, or similar;
- LMP92064 simultaneous sampling, low-side, SPI interface current/voltage monitor.

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