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Lab/Semester/Master Thesis

IPv6 for Wireless Sensor Networks

Wireless sensor networks are a valuable tool to gain a digital representation of the physical world. Sensor nodes are equipped with a radio module to exchange messages with other nodes or a base station. Nowadays most sensor networks employ proprietary communication protocols, e.g. the Active Message scheme of the TinyOS operating system. This makes it difficult to build a sensor network consisting of a large number of different sensor nodes. The vision of a *Internet of Things* requires a large address space and autoconfiguration capabilities. However, sensor nodes differ greatly from normal Internet hosts due to their limited computation power and energy constraints. Recent research has shown that it is feasible to bring the IPv6 protocol and the hardware constraints of sensor nodes together. The 6Low-PAN (IPv6 for Low-power Wireless Personal Area Networks) working group standardized a header structure for IPv6 on IEEE 802.15.4 enabled sensor networks.

The goal of this thesis is to survey the current work on IPv6 for sensor networks. Furthermore, a small testbed of sensor nodes should be connected using the IPv6 protocol. The *Pixie* sensor node developed at TIK is already equipped with a IEEE 802.15.4 enabled radio module. This work can build on existing protocol implementations already available today for TinyOS and should extend them where necessary. Finally, it should point out the current limitations of this technology and give a starting point for further research in this area.

Required Skills

You should already have some skills in software development and you should be familiar with the C and JAVA programming language.

Are you interested? Please contact us by email or phone.

Advisors

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