Thesis
(B.Sc./M.Sc.)

Quality of Service
Medium Access Control Protocols for
Wireless Sensor Networks

Motivation

Quality of Service (QoS) support in WSNs was neglected for a long time since it was assumed that applications for WSNs are very delay and fault tolerant. However, due to advantages in technology a large number of applications, e.g. multimedia, surveillance, industrial process control, **structural health monitoring** or health care, becomes interesting under economical aspects. Nevertheless, QoS support is very hard to achieve in WSNs as a consequence of the low data rate and the hardware limitations compared to mesh and ad hoc networks. In this thesis you will implement and evaluate different QoS mechanisms in terms of typical performance parameters, e.g. packet loss, delay, jitter, throughput and energy consumption.

Your Task

Your task consists of the following steps.

1) Get familiar with OPNET

2) Implement different QoS mechanisms

3) Develop new QoS mechanisms

4) Create challenging testbed scenarios

5) Perform simulations and evaluate the performance of the protocol

Depending on the project's scope, this part will be more (MSc, Diplom) or less in depth (BA)

Structural Health Monitoring

Requirements

Previous knowledge of communication issues and Discrete Event Simulation (DES) is useful but not required since you will be provided with the corresponding information and tutorials. Some knowledge of C will give you a clear advantage.
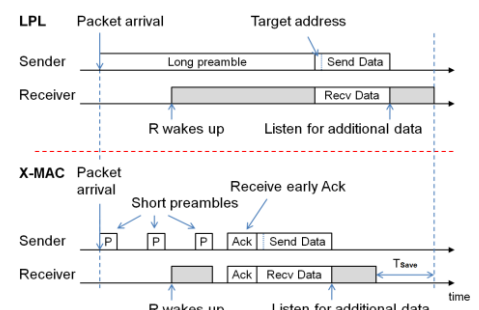
Medium Access Control

Keywords

Medium Access Control, Wireless, Sensor, Network, Quality of Service, Testbed, Simulation

Alexander Klein
{klein}@net.in.tum.de