THROUGHPUT AND DELAY ANALYSIS IN WIRELESS SENSOR NETWORKS

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Abstract

A typical wireless sensor network consists of sensors powered by small batteries that are difficult to replace if not impossible. In this paper, we propose a detailed energy survey of the physical, data link, and network layer by analytical techniques. We also show the impact of regular sleep periods on node energy consumption and present a comparison analysis of single-hop vs. multi-hop communications in the energy realm. A detailed energy expenditure analysis of not only the physical layer but also the link and network layer provides a basis for developing new energy efficient wireless sensor networks. Regular, coordinated sleeping extends the lifetime of sensor nodes, but systems can only benefit from sleeping in terms of transmitted packets if the data arrival rate to the system is low. Energy efficiency is the driving motivation for it can be considered the most important factor for wireless sensor networks because of the power constraints set by battery operation. From the analysis we extract key parameters of selected MAC protocols and show that the simulation result for throughput and delay some traditional mechanisms, such as using modulation techniques.