CCIT Report #552
August 2005

Threshold-Related Throughput – A New Criterion for Evaluation of Sensor Network Performance*

Ilya Ledvich, Adrian Segall
Department of Electrical Engineering
Technion – Israel Institute of Technology
Haifa 32000, Israel
iledvich@tx.technion.ac.il, segall@ee.technion.ac.il

Abstract

Energy efficient and power aware protocols are of utmost importance in Sensor Networks. The most popular criteria, so far, for evaluating performance of energy-aware protocols are *lifetime* and *throughput*. One of the main contributions of the present report is to show that those criteria are often insufficient indications of the algorithm performance. Here we propose a new criterion, named *threshold-related throughput*, which provides a much better measure of the algorithm performance. The other main contribution is an extensive investigation of a large variety of routing protocols and routing cost metrics activated on a variety of Sensor Networks topologies and initial energy configurations. Performance of these protocols and configurations is studied and compared using the new criterion.

1 Introduction

1.1 Overview and Related Works

The research interest in different aspects related to deploying and further exploitation of Sensor Networks has been increasing in the few last years. A Sensor Network can be quickly and easily deployed and thus is suitable and very attractive for many environmental, commercial and military

* This research was supported by The Israel Science Foundation , Grant No. 148/03