Abstract

The Wireless Sensor Network (WSN) consists of a large number of sensor nodes that are limited in energy, processing power and storage. The efficient use of energy of nodes is one of the most important considerations as the lifetime of a Sensor Network is limited by the energy available in the nodes. While energy consumed in computation and processing is almost negligible, most of the energy consumption is during radio transmission and reception of packets. LEACH is one of the most well known hierarchical data gathering protocols for WSNs that uses clustering mechanism for energy efficiency; it elects a cluster head (CH) based on a probability model. In this report, we present a survey of LEACH and one of its improvements LEACH–C highlighting their features. We also survey the challenges of cluster based routing protocols that need to be considered in future designs.

We have performed a simulation study in ns2 environment to analyze the energy efficiency of the above mentioned hierarchical data gathering protocols in wireless sensor network (WSN). Based on the experimental results we have devised an enhancement in the protocol in respect of cluster-head selection. The proposed scheme is based on having a centralized cluster-head selection. It focuses on reduction in energy loss over long distance paths.

Simulation of the proposed enhancement of the protocol for sensor networks indicates initial reduction in energy consumption of the network as compared to LEACH and LEACH -C which may further reduce on introduction of more levels of clustering hierarchies .