ABSTRACT

Wireless Sensor Network (WSN) is a collection of nodes such as sensors connected via Ad-Hoc network. The main function is to collect data WSN spread through a network sensor that can be sent via Ad-Hoc communication to the Base Station for further processing.

One of the main problems in the implementation of WSN is energy consumption and the lifetime of the sensor nodes. Energy consumption and the lifetime of the WSN sensor is limited due to the power supply sensor node is only supplied by the battery for operation. One solution to overcome this problem is to design WSN with hierarchical method, that is by including communication node into the cluster and perform aggregation to transmit data to the Base Station.

In this thesis, simulated two types of hierarchical routing protocols ie Low Energy Adaptive Clustering Hierarchy (LEACH) and Hybrid Energy Efficient Distribute (HEED). The difference between LEACH and HEED is LEACH use a random method to determine Cluster Head (CH) CH while HEED determine based on two parameters: the residual energy and Analysis of intracluster communication cost comparison between the two protocols include energy consumption and the lifetime of the network by using Matlab R2012a ,

For the conversion of the number of nodes scenario, total consumption to its lowest LEACH 0.64 joules while HEED only requires 0.38 joules. For the highest energy consumption, consuming LEACH 13.73 joules while HEED lower at 6.89 joules. For the fastest total mortality, experienced by the Protocol LEACH with total mortality in round 212, while the most rapidly HEED protocol total deaths in the round to 603. For the longest life span, experienced by HEED is at the round to 759, while LEACH experiencing the longest life span the round to 468.

For the initial energy conversion scenario, a maximum energy consumption on LEACH Protocol magnitude is 5.93 joules while the HEED magnitude is 3.79 joules. For minimal energy consumption, LEACH protocol consumes 4.7 joules while the HEED of 3.26 joules. The fastest total death occurred on LEACH Protocol is at 129 while the HEED round round to 250. The longest life span of the network on which the Protocol HEED 2246 LEACH round and round in 1093, or approximately 50% of all lifetime HEED Protocol.

Keywords: *WSN, Routing, LEACH, HEED*