ABSTRACT

Sensor network technology has become a trend in recent times, research on WSN and IoT is also developing because many sensors require a wireless network to communicate data. To perform wireless communication, the sensor requires power in the form of a battery so that it can be placed anywhere without having to be near the power supply. From this background, a breakthrough is needed so that the sensors/nodes on the WSN network can extend their active period so that the exchange of information or the data transmission process does not experience many delays.

This thesis proposes a method to improve power efficiency in WSN, currently WSN uses an algorithm called LEACH (Low Energy Adaptive Cluster Head) which can distribute power load evenly on sensors in the network, but unfortunately the method used is to distribute power load is randomization without realizing the remaining energy in a node/sensor and the data transmission process is carried out continuously even though the data transmitted is the same data. Therefore, the LEACH algorithm requires improvement to include the remaining energy factor in a node to carry out the power load distribution process and transmit only when an anomaly or difference in observation data occurs, so it is hoped that it will improve power efficiency performance on the WSN network.

After modification, LEACH becomes an energy aware and event-driven protocol which is also known as event-driven T-LEACH. Then the simulation is performed 60 times to compare and analyze the power efficiency that occurs. The results obtained from the simulation show that the sensor device with event-driven T-LEACH has increased the average number of rounds by 119% with an average value of 2814.7667 rounds compared to the LEACH protocol which produces an average value of 2357 rounds, 217 and also there is an efficiency of using transmit power of 111% with an average value of energy used in one transmission of 0.091176 joules compared to LEACH which produces an average value of energy used in one transmission of 0.102404 joules

Keywords: *WSN, LEACH, event-driven LEACH, T-LEACH* .