

## ***ABSTRACT***

*Wireless Sensor Network (WSN) is embedded system equipment, which consists of one or even thousands of sensors. This equipment can be arranged to form nodes in the network that can communicate with each other. The WSN uses 802.15.4 WPAN network, which is also referred as low-energy wireless personal area network. One of the devices that use this 802.15.4 WPAN standard is ZigBee. However, one of the weaknesses of the standard routing on the layer Network WPAN is the fact that it is less supportive in the reliability and scalability. Moreover, it makes the existence of the isolated node possible if some of the router are off. Therefore, a method of routing that can seek for alternative route from sensor node to the coordinator is needed. To make the sensor nodes communicate properly, appropriate Routing Protocol is needed in order for the data communication delivered quickly and accurately while only using less energy from the battery. Protocol wireless ad-hoc routing is considered suitable for Wireless Sensor Network because of its dynamic topology and because it can also operate with limited energy.*

*This final project is intended to analyze the performance of the Greedy Perimeter Stateless Routing (GPSR), which is an energy aware routing protocol, when it is implemented in the Wireless Sensor Network (WSN) Zigbee for monitoring system in the case of agricultural land that needs lots of widely dispersed sensors and requires limited energy resources. The routing protocol will be compared with previous research on the 802.15.4 wireless sensor network using the Ad Hoc routing protocols On Demand Distance Vector (AODV), which is also a low-energy routing protocol.*

*The measurements will be proceed when the process of data transmission from the sender node to the destination node by calculating parameters such as End-to-end Delay, Packet Delivery Ratio, and throughput. The performance of the routing protocol will show good Quality of Service with the calculation of these parameters as expected. measurements of the Energy Consumption as indicators Low Energy Routing Protocol.*

*Keywords: Wireless Sensor Network, 802.15.4, ad-hoc, GPSR, AODV, Energy Aware, NS-2*