ABSTRACT

The communication of wireless network between coordinator and end device can approximate from data rate, coverage area, network topology, routing protocol and network size. Wireless network technology divided into two groups to solve this problems, they are WPAN (*Wireless Personal Area Network*) and WLAN (*Wireless Local Area Network*). Zigbee is one of kind of WPAN group that uses at sensor and control for home application that does not need any data rate but can reach the area.

In this final project, modeling Zigbee networking in Wireless Sensor Network (WSN) using Network Simulator-2 in the single-hop-star topology. The value of performance network uses three parameters such as throughput, delay and packet loss.

The simulation result this final project acquired that the different packet rate which is sent, increase device number and with routing protocol use can increase network performance like increasing throughput value and decreasing delay and also packet loss ratio. Zigbee/IEEE 802.15.4 is used in home application with routing process with packet rate 10Kbps is more suitable with 5 devices, but if without routing process with generating packet time is random and use packet rate more than 10Kbps then the network performance is decrease so selection without routing process isn't good choices in Zigbee/IEEE 802.15.4 network.

Keyword : Zigbee, IEEE 802.15.4, WSN, *home application,* QoS, Network Simulator-2