ABSTRACT

QUALITY OF SERVICE (QOS) WIRELESS SENSOR NETWORK BASED ON ZIGBEE PROTOCOL

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Wireless Sensor Networks (WSN) working with limited energy and bandwidth, it needs a performance measurement to determined the level optimal reliability. The focus of this research is to measure and analyze the performance of Wireless Sensor Networks (WSN) based on ZigBee protocol. The Quality of Service (QoS) parameters are measured average delay, average throughput and packet loss percentage. This experiment is done by varying the values of packet length, transmitting time interval, distance, Line of Sight (LOS) transmission and Non Line of Sight (NLOS) transmission. The wireless hardware for experiment used XBee S2 (ZigBee) modules from Digi International. X-CTU software is to configure the XBee module. Docklight software is to simulate WSN in real time by setting the variable such as data packet, transmitting time interval, transmitting and receiving time, also log data result. The result shows that average delay and throughput increases as value of packet length increases. Difference transmission time interval isn’t impact to average delay and throughput for each packet length transmission. Packet loss percentage of LOS transmission is 0% for each data packet transmission to maximum transmission distance of 120 meters, although at NLOS transmission largest packet loss percentage value on the 80 bytes data packet transmission on position 4th sensor node, reaching 95.31%. The result of mesh (2 hop) network experiment shows that’s value of average delay more then point to point (1 hop) network and average throughput less then point to point (1 hop) network.

Key words : Docklight, Wireless Sensor Networks, Quality of Service, XBee, ZigBee