ABSTRACT

Entering the information era, wireless network keeps constantly evolving to meet the needs of information exchange to be easier and practical. Wireless network based on IEEE 802.11ah is an evolve of IEEE 802.11. A node in wireless network is a telecomumunications device that is very limited in resource such as the extent of the transmission range, battery power, and bandwidth. IEEE 802.11ah standard is created to resolve this issue because it supports wireless network scenarios such as arranging the large number of device, extensive large coverage, and the mechanisms of power consumption on a finite energy.

In this final project, the Doppler Effect against MAC layer in the IEEE 802.11ah standard, especially in available RAW (Restricted Access Window) are simulated and analyzed. Design of a simulation system is done with two scenarios, which are the changing of nodes density and changing of RAW slot. Then, network performance is measured using the results of the simulations generated by the Network Simulator 3 with focus on IEEE 802.11ah. the output of the simulation is QoS parameters, such as delay, throughput, and packet delivery ratio.

It can be concluded that the overall performance of the network using is getting lower along with increasing user speed, RAW group, RAW slot duration, RAW slot number, and bandwidth. In the node density scenario RAW accompanied by the changing of RAW station and RAW group, utilizing 2 group MCS 5 gain average delay value which is 0.060366 s, gain average throughput value which is 0.328120 Mbps, and gain average PDR value which is 99.8902 %. As for the RAW slot changing scenario, 0.020 s slot duration resulting worst performance which gain average delay value which is 0.135581 s, gain average throughput value which is 0.286828 Mbps, and gain average PDR value which is 99.3165 %.