

## ABSTRACT

The development of wireless communication (wireless) allows many standard or platform used. One of the evolving wireless technology today is the Wireless Sensor Network. Wireless Sensor Network (WSN) is a network that consists of a series of nodes that are interconnected with one another. Nodes are equipped with sensors to monitor physical and environmental surroundings such as temperature, sound, vibration, electromagnetic waves, pressure, movement, and others.

Research which is done recently is about a mechanism that works at the data link layer in WSN. One mechanism is the mechanism currently used CSMA / CA. In this final project I will discuss about the influence of the mechanism of CSMA / CA in WSN based on network performance based on influenced BE parameter. In addition to the value of BE, in this study we will also see the influence of network topology, the distance between nodes as well as background traffic to see the impact on network performance WSN.

From the simulation data results of this final project showed that the best network topology is a star topology. This is because it obtained the smallest delay. Also a small packet loss in the range of 35.62 bits / s to 39.64 bits / s. While throughputnya has the highest value is: 186.28 bits / s to 198.96 bits / s. While in the distance, the smaller the distance between the nodes then the network performance even better. This is seen in the data delay at a distance of 10 m has range of up to 0.068513915 0.063681181 s s. packet loss while it has a range of 35.62 bits / s to 39.64 bits / s. Throughput at a distance of 10 m is also the highest of the range of 186.28 bits / s to 198.96 bits / s. BE parameters also greatly affect the performance of WSN network, the higher the value the smaller lossnya BE packet is in the range of 35.62 bits / s to 39.64 bits / s. While more greater BE has the highest delay with a range up to 0.068513915 0.063681181 s s. On the throughput, the greater the value of BE then the throughput more greater in the range of 186.28 bits / s to 198.96 bits / s.

**Keywords : IEEE 802.15.4, WSN, CSMA/CA, ZigBee, LR-WPAN**