ABSTRACT

The study designed an Internet of Things (IoT) based building monitoring tool to be able to provide information in early warning using the waiting protocol method. This research can minimize the occurrence of building damage, resulting in a decrease in resilience. Wireless Sensor Network (WSN) is a platform for sensor deployment in many applications where multiple sensors work together. A waiting protocol method is a test method using an ancillary system in which a package will be given time to enter so that it will alternately send data to solve a problem on the basis of data received by the master node that affects the acceptance of the IoT system. The research was conducted in the Jakarta apartment building with nodes between 500 m and 2500 m to determine the difference in the signal strength received in each condition by analyzing the noise that occurs on buildings, trees, and other signal interference. Multi-distance digging obtained an RSSI of -98 dBm at 500 meters and -126 dBm at 2500 meters, with a ToA result of 0.45s at 500 meters and 1136.58s at 2500 meters, thus obtaining a packet loss of 51.15% at 500 meters and 67.76% at 2500 meters. With each test, the farther the node distance from the master node, the weaker the weaker the LoRa signal strength, and the difference between packet loss and PRR will be visible compared to the reverse because the further the distance between the sensor node and the master nodes caused by the collision of the unknown signal and the height of the buildings at the location affects the communication distance between nodes and will result in a reduction in packet losses so that communication is disrupted.

Keywords: *Building,* IoT, RSSI, *Waiting protocol,* WSN