

ABSTRACT

Low Power Wide Area Network (LPWAN) is one of the studies that is currently being conducted. LPWAN has advantages including far area coverage, relatively low costs, less power, relatively good service quality, and high scalability. There are several LPWAN technologies, namely SigFox, Ingenu, Weightless-N, LoRa, etc. Of the LPWAN technologies, the most developed are LoRa. LoRa is a spread spectrum solution that uses wide bandwidth to help protect against accidental interference or environmental noise.

LoRa has a scalability problem when connected in thousands of nodes that access together randomly so that the node cannot receive data simultaneously. So in writing this Final Project the author applies the scheduling method with the Controlled Delay (CoDel) and PFIFO Fast algorithms. Through this method, the author applies scheduling each node in the NS-3 simulation and performs performance tests in real time.

Based on the results of measurements made, the maximum distance measured is 2 km with the highest loss of 50% in SF 11. In this measurement, the largest delay value is 1.2 ms in SF 11. While the highest throughput is 488 bps in SF 8, while the lowest estimated at SF 7 at 428 bps. In addition to the delay measurement simulation with the CoDel algorithm the highest delay value is 1548 ms while the PFIFO algorithm is the highest delay value of 4491 ms. Throughput in the simulation uses vertices with a number of 50, 100, 150, 200, and 250 while the highest throughput is at 160 bps.

Keywords: *LoRa, LPWAN, Scheduling, QoS*