ABSTRACT

BPS Indonesia states that the highest growth of land transportation in the Java region 2012-2016 is trains. PT Kereta Api Indonesia has not provided Internet services on the train. This Final Project designed a Wi-Fi network on the Jakarta-Surabaya fast train using the IEEE 802.11n standard. On the network there is a server that functions to accommodate user traffic, and connects internal networks (on the train) and external networks (outside the train). In the network servers, scheduling is needed to regulate user traffic.

Network simulation is done using NS-3 software. The QoS parameters used are throughput, delay, and packet loss, for video streaming services. Internal network testing is done in phases of 1-5 carriage, using scheduling 10 ms, 100 ms, 250 ms, and 500 ms. External network testing is done by comparing simulation data with calculations using the capacity planning method.

Testing of 1 carriage has a user average throughput of 0.426 Mbps, approaching the result of bandwidth calculation which is 0.487 Mbps. The more number of users, the network throughput will decrease, and the longer the scheduling is used, the delay will be higher. Testing scheduling 100 ms has relatively more stable throughput and low packet loss compared to scheduling 10 ms, but has a higher delay. In the simulation of the worst case on external network, the throughput on the downlink side is 34.24036 Mbps, meets the calculation result of 36.39212 Mbps, then the delay obtained meets the standard used which is 40 ms.

Keywords: Wi-Fi, server, access point, high speed train