

ABSTRACT

Train transportation is one of the inter-city transportation options for which development continues. The design of a wifi network on a train is one part of developing a high speed train service. However, in the WLAN communication system there are problems that can reduce the quality of internet network performance, one of which is the hidden node problem. Hidden node problems cause collisions that also affect network performance to decrease. IEEE 802.11n utilizes the RTS/CTS mechanism used to minimize collisions on the network due to hidden node problems.

In this final project, a hidden node analysis is performed on IEEE 802.11n WLAN in a fast train car. Tests carried out in the form of simulations using the NS3.26 simulator. In the simulation process, four scenarios are used, namely hidden nodes when passengers make VoIP services, data, video streaming, and mixed services. The parameters analyzed in this Final Project are throughput, delay and PDR using the RTS/CTS mechanism to improve network performance due to hidden node problems.

Hidden node testing performed on the payload size of VoIP services, data, and video streaming with a minimum value of the ITU-T standard affects the results of throughput. Based on the hidden node test results of VoIP services, data (web browsing), video streaming, and mixed services show the composition of testing 1 (48N + 2HN) results in throughput, delay, and PDR that are relatively good because the resulting high throughput, the delay obtained is ≤ 150 ms and PDR for RTS/CTS conditions enable 100%. Meanwhile, the composition of tests 2, 3, and 4 results in poor network performance because it does not comply with ITU-T G.1010 standards. The use of the RTS/CTS mechanism enables hidden node testing to improve network performance. However, the use of the RTS/CTS mechanism allows the testing of the number of 4, 8, and 12 hidden nodes is not effective to minimize collisions that occur because of the higher transmission demand on the network

Key word : IEEE 802.11 WLAN, Hidden Node, Access Point, RTS/CTS, NS3