

ABSTRACT

Long Term Evolution (LTE) is a fourth generation cellular communication technology that has experienced an increase from the previous generation. In addition to increasing bit rates, LTE also offers other advantages such as low latency and high mobile speed. The emergence of the need for access to voice services on a mobile LTE network supported by VoLTE services, is expected to be able to provide better service quality than the previous generation.

In this study a simulation was conducted on the effect of user speed and the effect of the number of users on VoLTE service performance using the G711 voice codec. Simulation uses NS-3.27 software by testing or measuring QoS parameters in the form of delay, packet loss, throughput, and jitter. The simulation in terms of mobility using user speed starts from 30 km/h up to 440 km/h with the number of users 10. While the simulation in terms of capacity uses speeds of 430 km/h with the number of users from 20 to 300 users. In addition, simulations were carried out on 1 user, which was viewed from the side of mobility, but with conditions there were 30 users on both eNodeB.

The test results based on mobility, obtained the ideal speed on VoLTE services for 10 users who are still in the proper category based on the four QoS parameters is 430 km/h with a delay value of 18.22 ms, throughput of 0.14 Mbps, packet loss of 1.44%, and jitter equal to 0.93 ms. The ideal number of users on VoLTE services for speeds of 430 km/h based on the four QoS parameters is 20 users with a delay value of 24.73 ms, jitter of 9,36 ms, packet loss of 1,46%, and throughput of 0, 14 Mbps. While the ideal speed of the test results on 1 user is 180 km/h with a delay of 31.91 ms, jitter of 13.49 ms, packet loss is 1.42%, and throughput is 0.14 Mbps.

Keywords: VoLTE, Mobility, QoS, G.711