

## ABSTRACT

The LTE technology is a developing technology in the cellular communication system. Nowadays the LTE technology is only used to access a faster internet data activity. While 2g or 3g is still used for making calls. VoLTE is one of the way to improve the service quality on voice call. The reason VoLTE is used on 4g network is because the voice quality based on IP.

The calculation of QoS on this research is done using the NS3 analysis software which is a software to simulate the network behavior through mathematical model to know the capacity of UE one enodeB can handle, where enodeB is the base station on LTE. The research starts with planning the LTE network with VoLTE implementation. Which consists of enodeB, UE, multimedia system IP in the LTE's core network.. The simulation analysis used 30, 50, 70, 100, 130 UE and so on until the expected result is shown and ue is located in the same cell. Using the G.711 codec which is a narrowband codec with data rate reaching 64kbps. The reason the G.711 codec is chosen because it is commonly used in the voice service. Based on previous research by Fanny Tarida Tampubolon with the title "Simulation And Performance Analysis End-To-End QoS Using G.711 and G.729 as Codecs On Voice Over LTE Service (VoLTE)" using codec g.711 has a better performance. The parameters used in this research are delay, jitter, throughput and packet loss.

The cell capacity measurement is seen from the service quality parameters value towards the traffic density with the number of users equals to 30 until 280 users. From the results, the delay parameter showed a capacity of 280 users with the value 402.66 ms, jitter showed a capacity of 250 users with the value 5.10 ms, packet loss showed a capacity of 200 users with the value 0.68% and throughput showed 230 users with the value 0.07 mbps. If involving all of the parameters, then the true cell capacity is 200 users with the delay value 36.92 ms, jitter value 1.52 ms, packet loss value 0.68% and throughput value 0.07 mbps, while using all parameters it still fullfill the ITU-T standard.

**Keywords: VoLTE, LTE, QoS, G.711**