

ABSTRACT

Millimeters Wave is a wave that works in the frequency of 30-300 GHz. In these frequency bands, Millimeter Wave can provide better network quality for use in 5G technology. Voice and video services are services that are often used by users to communicate with each other. In this study, we analyzed the performance of voice and video codecs in 5G millimeter wave networks for non-standalone schemes (Core Network uses Evolved Packet Core). Previously, an analysis of voice codec performance had been done but on the LTE network. As is known, millimeter wave is a standardization that will be used in fifth generation of cellular technology (5G), for this reason, it is also necessary to conduct research on the performance of voice and video services on the millimeter wave. This research was conducted by running a millimeter wave algorithm with several voice and video traffic based on the codec in Network Simulator-3.27, then analyzed and compared the results of QoS which included delay, throughput and jitter from each codecs. The results of this study are expected to conclude whether millimeter waves are capable of producing network quality as targeted for 5G networks or not.

Based on the simulation results, for the best voice quality the G.711 codec gets the lowest delay and jitter value, which is equal to 1.008 ms for delay and 0.002 ms for jitter. G.723.1 codec on voice traffic is the best codec for bandwidth efficiency because it has the lowest throughput value of 0.207 Mbps. G.723.1 codec can save 5x bandwidth capacity compared to G.711 codec and is able to save 43% bandwidth capacity compared to G.729 codec for voice service. On video traffic, for the best video quality the H.264 codec gets the lowest delay and jitter value of 0.96 ms for delay and 0.079 ms for jitter. The H.265 codec is capable of 51% saving bandwidth capacity compared to the H.264 codec.

Keywords : 5G, Milimeter Wave, Voice Codec, Video Codec, QoS, Network Simulator-3.

