

## ABSTRACT

The need for cellular data usage is starting to grow rapidly along with the increase in mobile communication devices such as mobile phones and tablets. In its implementation to implement fifth generation cellular technology still difficult because it requires more money and time. Therefore, before replacing the existing architecture completely with 5G, the 5G mmWave architecture can use the Evolved Packet Core (EPC) which is the core network of 4G LTE technology as a backbone network so that 5G implementation can be quickly realized.

Mobile users themselves move at varied speeds. Transmission Control Protocol (TCP) as a transfer protocol for performance will be affected by this varied user speed by creating the possibility of congestion. But TCP itself has a congestion control method that is useful for overcoming congestion problems on the network. This congestion control can be used to maximize TCP performance in scenarios that still use the core network of 4G LTE as a backbone with users who have varied speeds. TCP has several algorithms that handle congestion control. The algorithms are then better known as TCP variants.

In this study, TCP CUBIC and YeAh variants were used to analyze the 5G mmWave and EPC network conditions as core networks. with Network Simulator-3. Quality of Service (QoS) parameters to be analyzed include delay and throughput.

**Keywords:** 5G, Milimeter Wave, EPC, TCP, Network Simulator-3, QoS.