ABSTRACT

The 5G technology requires network devices capable of accommodating large amounts of data at high speeds. Therefore, the use of small cell antennas is considered one of the solutions to address these challenges. However, there are several obstacles in implementing this technology, one of which is the incomplete compatibility between small cell antennas and 5G technology. Additionally, there are issues related to system security and interoperability.

To overcome these challenges, this document proposes a solution design using Open Air Interface technology for the Core Network and RAN (Radio Access Network). The Core Network technology is employed to enhance network performance and security, while RAN ensures interoperability among various devices involved in the network. By adopting this solution design, it is expected that the implementation of 5G technology on small cell antennas can be carried out more effectively and efficiently, thereby improving network quality and provided services.

During the implementation, speed testing was conducted on the smartphones used, yielding a download speed of 74.95 Mbps, upload speed of 13.62 Mbps, and latency of 33 ms. Quality of Service testing was performed in four scenarios, resulting in an average throughput of 9.82 Mbps, 0% packet loss, and delay of 25.5 ms in one scenario due to an idle position, while one scenario was below 1 ms, and two scenarios were close to 1 ms. Jitter was observed to be within the specified parameters for all scenarios.

Keywords : 5G, Core Network, Radio Access Network, Quality of Service, Antenna Small Cell