

ABSTRACT

The development of 5G New Radio technology has been commercialized by cellular operators in several countries with their own strategies. Meanwhile, with the implementation of 5G in Indonesia, the frequency spectrum resources owned by each operator have been allocated for existing 2G, 3G and 4G technologies. Therefore, each operator has a strategy for managing its own frequency spectrum allocation so that the presence of new technology does not reduce the quality and capacity of the existing network. The frequency spectrum is a limited and expensive resource. Thus, radio frequency planning is an important step to maximize the quality and capacity of the network. Based on 3GPP release-15, 5G NR technology has a Dynamic Spectrum Sharing (DSS) feature that supports 4G and 5G technologies to use the same frequency spectrum allocation. In this final project planning and simulation is carried out in the city of South Tangerang at a frequency of 900 MHz and 1800 MHz.

In this research, the 5G NR network planning was carried out using the Dynamic Spectrum Sharing technique at the existing LTE technology frequency. Network planning calculations and parameters analyzed include coverage and capacity. Then simulated with Atoll 3.4.0 software with the Urban Macro (UMa) propagation model which has been standardized by 3GPP TR 38901.

Based on the results of planning calculations and simulations, the number of site requirements is 72 sites to accommodate coverage and capacity requirements in the city of South Tangerang. By using the DSS technique, the simulation results of 5G radio frequency coverage with the SS-RSRP test parameters obtained an average of -91.25 dBm. Meanwhile, the results of the 5G quality simulation with the SS-SINR test parameter obtained an average of 12.99 dB. Meanwhile, the simulation results of network access speed with the data rate test parameter reach an average of 90.24 Mbps.

Keywords: 5G NR, LTE, DSS, UMa