

ABSTRACT

Application of Long Term Evolution (LTE) in Indonesia is not optimal because of the limitations of the Spectrum, to resolve the issue 3GPP issued the latest technology that supports LTE-Advanced carrier aggregation feature. Thereby providing higher throughput with more efficient use of spectrum.

At this project LTE-Advanced network planning using inter-band carrier aggregation there are using bandwidth of 5 MHz in 850 MHz bands and a bandwidth of 10 MHz in 1800 MHz bands. To see improved performance using carrier aggregation, designed by LTE network in 10 MHz bandwidth in the 1800 MHz bands. To get the maximum performance network planning LTE and LTE-A will be combined with the use of schemes PCI and SFR. Simulations performed using U-Net software v300 and the parameters measured and analyzed on network planning LTE and LTE-Advanced include: RSRP, SINR, Throughput and connected users.

By using the site selection and criteria obtained the number of sites = 241 sites LTE and LTE-A = 43 site. The prediction results for LTE network planning non-CA acquired RSRP value ≥ -94.87 dBm, dB SINR ≥ 3.77 , ≥ 7.6 Mbps Throughput and User connected = 99.75%, while LTE-A network planning with the obtained value RSRP $\geq$ CA -76.24 dBm, SINR ≥ 5.6 dB, Throughput ≥ 13 Mbps and User connected = 100.00%. To get the maximum performance combined with the use of the scheme and SFR PCI, PCI usage increases by 1 dB SINR and throughput increased by 200 Kbps, while the use of SFR scheme increases by 9 dB SINR and throughput increased by 13 Mbps. Based on the standard key performance indicators (KPI) of 3GPP, From the simulation results using the U-Net software version 300 non-CA network planning LTE and LTE-A with CA reached the standard KPI is ≥ 12 Mbps. Implementation aggregation carrier can increase RSRP, SINR, throughput and can overcome the problems of limited spectrum so that throughput increased with an efficient use of spectrum.

Keyword : LTE-Advanced, PCI, SFR, Carrier Aggregation.