

ABSTRACT

Providing good quality data communication services is a challenge for telecommunication operators to increase the need for data communications services especially in the city center such as Kudus city. Kudus has an area of 10.47 km² with a population of 97961 inhabitants. With the large number of inhabitants, it affects the number of mobile phone users in the Kudus City Center. In the Kudus City Center there are 4 NodeB to serve data communication services using 3G technology, but there is one NodeB is unable to serve the data communication needs because of its full traffic capacity. In addition to full traffic capacity, high payload demand, the number of handset users who already support LTE and the number of customers who already use USIM.

In this Final Project discuss about migration planning analysis from 3G network to Long Term Evolution (LTE) network. Discussion on this Final Project focus on radio network planning is planning on the side of capacity and coverage. The LTE technology planning process takes into account the number of productive age populations used for the estimated LTE service users in the Kudus City Center, then estimates the estimated 5 years LTE technology users. After doing the planning then done the simulation using Atoll software and conducted analysis to result of planning.

LTE network migration planning has better cell throughput quality and capacity compared to existing 3G network conditions. Where the existing condition of 3G networks in 2017 there are 4 sites as soon as done planning migration to the LTE network the number of sites required is 7 sites with a radius of 0.532 km. The result of migration planning to LTE network obtained average RSRP value or signal level received by each user with estimated number of user / km² is 2133.98 user equal to -64.79 dBm, for existing 3G network condition average RSCP value or signal level accept with estimated number of user / km² as much as 1301.1 users for -108.15 dBm. The average SINR value obtained is 5.42 dB, in the existing condition Ec/No value of -36.68 dB. For the average throughput after migration to LTE of 19672 Kbps, while the existing conditions average throughput of 1255 Kbps. In the simulation of traffic with monte carlo when the existing conditions of the number of users connected to the network by 20% and the number of users who can not connect to the network by 80%. Meanwhile, after the migration of the number of users who connect 99% and the number of users who are not connected 1%. Aggregate throughput value of uploaded and downloaded cell after migration to LTE network of 9 Mbps and 41.72 Mbps and when existing 3G network condition is 3.49 Mbps and 9.96 Mbps. With this, the signal levels received before and after migration to the LTE network increased by 45.16% and the aggregate throughput of upload and download successively increased by 157.87% and 318.87%.

Keywords: Migration, 3G, Planning, LTE, Coverage, and Capacity.