

## **ABSTRACT**

*Capacity is a very important thing in operator, because the capacity is a factor that determines the number of user and the quality of service. Beside capacity, the quality of service is also affected by the coverage area and the types of services that used by the user. Problems encountered at this time is an increasing the number of users, but it does not proportional to the number of NodeB. Therefore, upgrade capacity was an optimization step NodeB without adding new NodeB.*

*3G network upgrade can be done by adding the spreading factor, the power supply or the channel element. As consideration of a need to upgrade or not NodeB, seen by the value of the congestion statistics on the number and type of NodeB via RNC. In addition, consideration upgrade is also seen the quality of the condition RF by doing walk test based on parameters RSCP (Received Signal Code Power) and  $E_c / N_o$  (Energy Per Carrier Noise). At this final project, type of congestion that exceeds the standard KPI is a channel element, so that the optimization needs to be done based on the maximum amount of traffic using the formula Erlang B. After the upgrade process, to see the results of it's performance to be able through statistical and test drive. As for changes in the quality of data received service user seen from the throughput parameter.*

*As before expandable, the maximum amount of congestion 53 and maximum data dropcall 3.3%. As for the quality of the coverage obtained  $RSCP_{max}$  -52 dBm and  $RSCP_{min}$  -83 dBm with  $E_c/N_{o_{max}}$  -7 dB and  $E_c/N_{o_{min}}$  -16.5 dB. In addition the quality of capacity shows the throughput of the average is 99.06982 Kbps. After the upgrade, the value of congestion is 7 and decrease until 76,67% with data dropcall value 1.93%. While the quality of the coverage shows  $RSCP_{max}$  -62 dBm and  $RSCP_{min}$  -76dBm with  $E_c/N_{o_{max}}$  -4 dB and  $E_c/N_{o_{min}}$ -13dB. The average of throughput increase 94,95% and become 1.98 Mbps the average throughput for the quality of capacity.*

*Key Word : Channel element, walk test, congestion, dropcall of data,  $E_c/N_o$ , RSCP, throughput, 3G network , Erlang B*