ABSTRACT

The development of the 4G LTE network in Indonesia is still uneven, because the LTE network is still concentrated in urban areas, especially big cities in the province of West Java, while the palapa ring network has been completed, but there are still areas that have not received a good network in their area so that it is necessary to build a backhaul network as a medium that connects the access network devices to the core network.

In this final project, a network design is carried out by determining the location for eNodeB backhaul on a 4G LTE network based on geographical location and taking into account the user traffic needed to determine and determine the backhaul link using fiber optic transmission media, configuration of the eNodeB network system to be designed in Cikalong District.

The simulation results on the backhaul link using STM-4 for the best value, Q-factor 8.14, BER 7.51×10^{-17}*, and power received -20.32 dBm, for the worst value Q-factor 10.2, BER* 4.55×10^{-25}*, power received -22.972 dBm, the backhaul link uses a transmitter power of 1 dBm. On the access link with GPON on the uplink side for the best value of Q-factor 36.51, BER* 2.7×10^{-292}*, and power received -21.62 dBm, for the worst value of Q-factor 20.97, BER* 5.08×10^{-98}*, power received -24.98 dBm, on the link access on the uplink side using a transmitter power of 1.5 dBm. On the access link with GPON on the downlink side for Q-factor 37.41, BER* 9.7×10^{-307}*, and power received -20.72 dBm, for the worst value Q-factor 27.65, BER* 1.28×10^{-168}*, power received -22.93 dBm, on the access link side downlink uses a transmitter power of 1.5 dBm.*

Keywords: *backhaul*, eNodeB, *fiber optic*, 4G LTE, STM-4.