ABSTRACT

In the province of South Kalimantan, especially in the Aluh – Aluh sub-districts, there is no adequate 4G LTE network infrastructure. The Palapa Ring network infrastructure development project has been completed but the internet network is still not fully accessible in remote areas, so a backhaul network is needed as a liaison between the base transceiver station and the base station controller.

In this final project, do the design by determining the area where the backhaul network will be designed as a 4G LTE lastmile based on geographic location and taking into account user traffic and ensuring that the service/signal can be spread throughout the targeted area to determine the design of the backhaul link using fiber optic media. . Network design uses capacity planning and coverage planning parameters to determine the number of sites and to determine the configuration of the eNodeB network system designed in Aluh – Aluh District.

The simulation results on the backhaul link using STM-4 transmitter power of -3 dBm get a Bit Error Rate value of $2{,}123 \times 10^{-11}$. On the access link using GPON with a power transmitter of 2 dBm on the upstream side for the best value, the Bit Error Rate value is $6{,}310 \times 10^{-30}$. Meanwhile, for the worst value on the upstream side, the Bit Error Rate value is $6{,}105 \times 10^{-10}$. While on the downstream side for the best value, the Bit Error Rate value is $5{,}060 \times 10^{-48}$. Meanwhile, for the worst value on the downstream side, the Bit Error Rate value is $9{,}809 \times 10^{-23}$.

Keywords : 4G LTE, Backhaul, Capacity Planning, Coverage Planning, eNodeB, Fiber Optic, GPON, STM-4