

## ABSTRACT

The use of the internet is increasing, especially among productive age groups during the Covid-19 pandemic, such as among students who conduct school online, and workers who are working from home so they need adequate internet services that support residents' activities and time effectiveness. However, the internet needs have not been met by providers of Taman Asri Indah Housing Complex because of the unavailability of an optical network, so a Fiber To The Home network design and analysis using GPON technology is carried out for triple play services at Taman Asri Indah Housing Makassar.

In this final project, network design is carried out using simulation and calculations of the feasibility and performance parameters of the system implemented at Taman Asri Indah Makassar Housing Complex are carried out. The design is carried out based on measuring the closest OLT distance to the customer side, then determining the distance from ODC to ODP. The design of the FTTH network at Taman Asri Indah Housing uses 2 methods, namely the design of Single Stage and Two Stage.

In designing the FTTH access network with GPON technology using the One Stage method, the BER performance results for the closest downstream manual calculation are  $2,170 \times 10^{-10}$  and the simulation is  $3,181 \times 10^{-10}$ , the manual calculation results for the farthest downstream are  $2,386 \times 10^{-10}$  and a simulation of  $4,343 \times 10^{-11}$ . Whereas in the Two Stage method, the results of the BER performance in manual downstream calculations Nearest are  $4,034 \times 10^{-12}$  and simulations are  $3,730 \times 10^{-12}$ , the results of manual calculations on the furthest downstream is  $4,455 \times 10^{-12}$  and the simulation is  $4,109 \times 10^{-13}$ . Based on the results above, the BER value meets the ideal standard, namely  $\leq 10^{-9}$ .

**Keywords: FTTH, GPON, BER**