

## ABSTRACT

Internet traffic continues to experience tremendous growth due to the development of applications that require large bandwidths such as online gaming and video streaming, the significant traffic generated by mobile devices and the growing deployment of Internet of Things systems that require communication between devices. With the advantages of fiber network, such as unlimited bandwidth and immunity to electromagnetic interference, Fiber To The Home (FTTH) network based on Gigabit Passive Optical Network (GPON) technology has become the most attractive solution for network access. One of the fiber optic network service providers is PT. Telkom. In this Final Project, a Fiber To The Home (FTTH) network design has been carried out with a practical approach that is applied to buildings in the Ubud Village Cluster. This housing is a cluster that has been covered by fiber optic lines but is already full and causes passive accumulation problems. The research conducted is to design FTTH GPON with a practical approach, namely efficient cable lines to customers and selection of cable types for network installation areas. The discussion carried out is the design of the FTTH network to the allocation of ODP to the homepass and analysis of system feasibility tests by performing empirical calculations and simulations, calculating parameters in the form of Link Power Budget (LPB), BER and making a bill of quantity as an estimate of development costs in this final project. Based on the results obtained from the design, the closest Homepass distance from ODP is 10 meters and the furthest is 99 meters. The simulation results obtained the best LPB at a distance of 1.753 km which is at the nearest ODP point of  $-18,113$  dBm. The best BER obtained is 0.

**Keywords :** Triple Play, GPON, Fiber To The Home, Power Link Budget, Bit Error Rate