ABSTRACT

Technology is continously developed, especially telecomunication and information. Telecomunication and information is not only sound, but also video and data. With the development of technology, we need a good access speed. Buah Batu Park apartment *which located in* Yayasan Pendidikan Telkom *area is a great estate for Fiber Optic To The Home* (FTTH) *for triple play service (voice, video, data). Gigabit Passive Optical Network is a technology that used by* PT. Telkom*.*

In this final project, researcher going to design three alternatives of Fiber Optic To The Home network access using Gigabit Passive Optical Network technology, which is the OLT located in Cijaura *central office*, OLT *located inside the building with 4 units of* ODC*, and* OLT *located inside the building with 1 unit of* ODC. *The design begins with deciding the location, gathering building information such as floor plans and service needs, and* FTTH *design begins with deciding the tools such as the tools spesification, the layout, and the amount of the tools. Then the design will be analyzed based on parameter that have been determined which consist of link power budget, rise time budget, signal to noise raito, and bit error rate.*

The design result shows that the design for Buah Batu Park Apartment *that used* OLT *located in* Cijaura *central office, 1* ODC *unit, 59* ODP *units with 1095* ONT *users produces the smallest attenuation and the best system performance. The calculation result for link power budget with the Prx -17.1059 dBm and with the distance of 0.017 Km for uplink and -17.1048 dBm for downlink. Those power link budget results are still below the standard that set by* PT. Telkom*, which is -28 dBm..The rise time budget calculation in uplink and downlink for the farthest user is 0.25ns. that time is still below the standard of* NRZ *coding which around 0.5833 ns for uplink and 0.2917 ns for downlink. The system calculation result of* S/N *is 31.243 dB and* BER *of 1.167 x* 10^{-54}*. So that we can conclude that there almost no dispersion from this design.*

Keyword : FTTH, GPON, *Link Power Budget, Rise Time Budget, Bit Error Rate*