

## ABSTRACT

To support triple play services, PT.Telkom replace all copper access network to a fiber-optic access networks through projects Trade In Trade Off (TITO)<sup>[6]</sup> who cooperate with PT.Inti. With the replacement of the entire copper access network to optical access network, certainly for the future PT.Telkom no longer build new copper-based access network. In addition, for optical fiber access network technology used by PT.Telkom today, especially Fiber to the Home (FTTH), which uses ZTE GPON technology, still has some shortcomings in the system Fiber Termination Management (FTM) that still traditional.

In this final project, conducted the FTTH access network design by software using the technology of Gigabit Passive Optical Network (GPON) Huawei for residential Pesona Ciwastra Village. The design begins with making the initial path, then the determination of the device, specifications, layout and volume used. Then to feasibility analysis system with parameter Link Power Budget (LPB) and Rise Time Budget (RTB), while for system performance parameters analyzed using Signal to Noise Ratio (SNR) and Bit Error Rate (BER). As well as the analysis capability FTM Huawei non-traditional (iODN) functions on the Huawei Network Management System (NMS) -GPON Huawei server.

Results of analysis for ONT farthest distance, downlink value of each parameter generating value  $P_r = -23.8683$  dBm, rise time of a total of 0.2514 ns using NRZ coding, amounting to 32.91 dB SNR, and BER of  $4.0943 \times 10^{-110}$ , while the uplink each parameter produce  $P_r$  value of -23.9913 dBm, the total rise time of 0.25 ns using NRZ or RZ coding, amounting to 36.79 dB dB SNR, and BER  $9.4477 \times 10^{-264}$ . These results demonstrate the feasibility of a link meets the ITU-T standard that is at the limit of  $P_r$  [-28; -8] DBm, SNR with minimum limit PT.Telkom is 21.5 dB, and the value BER also meet standards for maximum optical link 10-6<sup>[3]</sup>. Feasibility is also shown on the downlink simulation results with  $P_r$  of -21.291 and BER  $2.0476 \times 10^{-263}$ , as well as on the uplink, with  $P_r$  of -21.512 and BER Analysis 0. By using iODN, it showed a significant level of efficiency with no longer used labeling system initialization wirting manual for each port on the device. Through a iODN system, which already have a GUI, for certain time efficiency in the allocation of disruption will be faster because the access device information more easily and it does not take much time. Ease of perfection that increases the value of KPI related to the time value MTTR, MTTI, and GAUL.

Keywords: Design FTTH, GPON, *Huawei*, FTM, and KPI.