

ABSTRACT

Based on data from PT. Telkom in Gorontalo City in 2017, 91% of telecommunications services in Gorontalo City still use 1P (One Play) and 2P (Two Play) services that support voice and data services, and only 9% of their telecommunications services use 3P (Triple Play) services that supports voice, data and video services. So it takes a design of customer migration to 3P (Triple Play) for all services needed in the region. In this Final Project, the author designs the migration of Fiber To the Home (FTTH) networks in Gorontalo City, especially in the Dulalowo region by using 1 ODC and 22 ODP for 164 ONT customers. The design of this migration is divided into 4 lines, namely Jl. Irian, Jl. Madura, Jl. K.H. Agus Salim and Jl. Sulawesi. This final project reviews the feasibility of the design based on theoretical calculations for Power Link Budget and Rise Time Budget, and the simulation results for Min.BER and Max.Q-Factor values. Based on the results of theoretical calculations for 4 lines, namely Jl. Irian, Jl. Madura, Jl. K.H. Agus Salim and Jl. Sulawesi obtained total attenuation values for downlink of -18,984 dBm, -19,051 dBm, -19,092 dBm and -19,215 dBm. while the uplink is -19,060 dBm, -19,147 dBm, -9,199 dBm, -19,357 dBm. Based on theoretical calculations for Rise Time Budget, the downstream is 0.2609 ns, 0.2658 ns, 0.2716 ns, 0.2897 ns. Based on the results of network design simulation using optical software for BER values obtained downstream of $5,929 \times 10^{-49}$, $2,396 \times 10^{-47}$, $2,142 \times 10^{-46}$, and $1,172 \times 10^{-43}$. While upstream is obtained at 3.116×10^{-106} , 8.973×10^{-102} , 3.750×10^{-99} , and 1.081×10^{-91} . From theoretical calculations and simulations it can be concluded that the design of FTTH networks is in accordance with the ITU-T G.984 standardization.

Keywords: FTTH, GPON, Rise Time Budget, Power Link Budget, Bit Error, Migration,