ABSTRACT

The increasing people needs for Internet, multimedia access and cable telephone communication, so we need a revolution in telecommunication technology. A technology to be the solution and can complete all the needs in the world of telecommunications is a technology of Fiber to the Home (FTTH). FTTH technology that use an optical fiber as a transmission media that is able to transmit data with a large bandwidth. PT.Telkom as a telecommunications service provider recommend access network Fiber To The Home to using Gigabit Passive Optical Network (GPON) technology to complete the needs of the service. GPON is one of the high-speed access technology which has the advantage of multiple services, and the availability of large bandwidth that support to triple play applications (voice, data, and video).

This final project is to design the access network Fiber To The Home (FTTH) using Gigabit Passive Optical Network (GPON) technology in Garden Villas Residence Bandung. In this project make two different design scenarios and selected the best designs result. In doing design, made the determination device specifications, layout, and number of devices to be used. And to determine the feasibility of the system, will be calculated on the parameters of feasibility and performance of the system. Those parameters are Power Link Budget and Rise Time Budget for the feasibility of the system. The parameters manually counted and compared with the results of the simulation design using software Opti System which will also feature parameter Bit Error Rate (BER) for system performance.

The results of manual power link budget calculation in scenario 1 is the total attenuation that is produced to ONT farthest distance for downstream link amounted to 21.303734 dB and for the upstream link is 22,31903 dB. As for the second scenario design values obtained downstream link power link budget in the farthest ONT amounted to 20.23965 dB and for the upstream link is 20,45688 dB. The results of both of these calculations are still above the standard specified by ITU-T and PT. Telkom, which amounted to -28 dBm. For the calculation of rise time budget in scenario 1 t_{system} link value obtained of 0.278105 ns for downstream link and t_{system} value of 0.25111 ns for upstream link. And for the second scenario t_{system} values obtained of 0.25135 ns for downstream link and t_{system} value of 0.250051 ns for upstream link. So the calculation of feasibility the system's rise time budget on the downstream and upstream links in both scenarios design has fulfilled feasibility with NRZ coding.

Keyword : FTTH, GPON, Power Link Budget, Rise Time Budget, BER