ABSTRACT

Pangalengan District has an area of 272.94 km2, this area covers 11.09% of Bandung Regency. In addition, Pangalengan District has a population of 154.29 thousand with a population growth rate of 1.07% per year. Seeing these conditions, the need for internet continues to increase. This design is also intended for underdeveloped, frontier and outermost areas and can be applied to the plantation, industry, trade and tourism sectors.

Gigabit Passive Optical Network is an access technology developed by ITU-T with the ITU-T G.984 standard as Broadband Access based on fiber optic cables. Optical fiber can be divided for downstream data with a wavelength of 1490nm and upstream with a wavelength of 1310nm. The Gigabit Passive Optical Network architecture runs with a point-to-multipoint system using passive splitters to divide the network. The upstream speed is 1.2Gbps while the downstream is 2.4Gbps.

FTTM is a specialized form of optical network with outputs that cover cellular subscribers and is designed for areas of need. FTTM is based on the nearest central STO. The wavelength of the FTTM network for downstream is 1490nm at OLT and on the upstream side 1310nm by applying WDM at ONT. FTTM is designed with two ENode-B design models namely twostage and singlestage. From the two designs, mathematical and simulation twostage results were obtained, Prx values of -19.36 dBm and -13.913dBm, SNR of 23.86dB, Q-Factor of 7.79 and 6.16, BER results of 3.4x10-15 and 3.5x10-10. Singlestage mathematical and simulation respectively obtained, Prx values of -8.03 dBm and -13.688dBm, SNR of 26.58dB, Q-Factor of 10.66 and 6.21, BER results of 7.8x10-27 and 2.5x10-10. The power received, Q and BER of the twostage singlestage design are ideal ITU-T G984. The total cost of implementing this Final Project design is IDR 2,997,841,859.88.

Keywords : *GPON, FTTM, ENode-B, twostage, singlestage.*