

## ABSTRACT

People need for services in the field of information and communication technology increases every year. Type of service required is no longer limited to voice but blossomed into service tripleplay (voice, data, and video). Newton's Buahbatu Apartment Building B as one apartment in the Buahbatu in hope to have the technology to support information needs for tripleplay services and communications. Apartment Newton who was in Buahbatu it was the location of the Research Project.

The methods used in the design of the survey, namely location, request customer service, design, as well as research results with analysis (power link budget, rise time budget, as well as bit error rate). This analysis is used in addition to the manual calculation also used simulation Optisystem7, then compared the results obtained.

The results of the design on this final Project obtained the value of the downstream power link budget for the farthest distance is -21.38 dBm while at the farthest distance is for upstream -5.62 dBm. This value is still below the receiver sensitivity of -28 dBm, so this design is considered feasible. As for the Rise Time parameter of the Budget obtained NRZ deadline delivery downstream and upstream ns 0.56270096 obtained 0.56270096 ns. Where the results of calculation of  $t_{sys}$  acquired is 0.2503 ns.  $t_{sys}$  value is still far below the value of the encoding so that the limit is still disqualified pass. In addition the simulation used in the analysis are Optisystem BER downstream  $7.48 \times 10^{-29}$ . While the results of the BER upstream obtained 0. Both of these values are still far below the  $10^{-9}$  so it's still good.

**Keywords : FTTB, GEAPON, *Power Link Budget, Rise Time Budget, BER***