

## ABSTRACT

The needs of fast internet access and multimedia services are quite high these days, considering that in 2015, PT Telkom is targeting the entire network of copper wires will already being replaced by fiber optic network. *FTTH (Fiber To The Home)* is a network infrastructure that will be developed in all parts of Indonesia without exception in the boarding house Sukabirus Telkom University, Bandung region. This FTTH will be implemented with *CWDM (Coarse Wavelength Division Multiplexing)* technology.

In this essay, the researchist designed a FTTH network using *CWDM multiplexer*, with reference to the location of the OLT-STO in Cijaura and ODCs lie behind Syamsul Ulum Mosque, Telkom education area with tehe number of suscribers are 32 units. The design begins by locating, collecting data. Design of FTTH is the determination of the form of the specification, layout and number of devices used. Then the design will be analyzed based on predefined parameters such as *link power budget, rise time budget, the signal to noise ratio and bit error rate.*

The device that needed in this design are G.652.D *fiber* cable along 0.5198 km, G.657 *fiber* cables along the 2.9 km, 68 pieces of SC connector, 2 pieces of ODP aerial 1:8, and ONT with specifications: *Optical power:* max 4 dBm; *Receiver sensitivity:* -28 dBm; *Insertion loss:* 4 dB; *Wavelength spacing:* 20 nm. From the calculation of the farthest distance with wavelength attenuation / km greatest  $P_{Rx}$  is obtained at -23.418 dBm for *downstream* whereas *upstream* is -22.4993 dBm. The Result of *link power budget* is still above the standard of CWDM receiver sensitivity which is -28 dBm. The calculation result of the *rise time budget* for the *downstream* and *upstream* on the farthest user generates a total time of 0.25 ns. The time period is below the value of NRZ coding which is 0.28 ns for the *upstream* and *downstream*. For S/N the results are 27.31 dB and BER of  $1.72 \times 10^{-30}$  for *downstream* and are 29.09 dB and the BER of  $2.25 \times 10^{-45}$  for *upstream*. System design has a very good performance as the S / N is still above standard owned by PT. Telkom which is 21.5 dB, and also the BER is smaller than  $10^{-9}$ .

Keywords: FTTH, CWDM,, *optisystem*, PLB, RTB, S / N, BER