ABSTRACT

Newton Residence is a luxurious apartment, complex unit total are 875 units, located in Jalan Buah Batu No. 5 Bandung. In this modern time, surely this prestigious apartment need communication, information, and entertainment facilities with high performance. To fulfill those needs, a reliable network for best performance is required. The best network available today which can ensure the best qualities and performances is Fiber To The Home (FTTH) network.

FTTH GPON network design for Newton Residence started with defining the total customer based on total maximum units available. Network configuration, the devices used, quantity, specification, and placement are defined next. After that, inter-devices distance are calculated. Last, the result of FTTH network design feasibility is being analized based on power link budget and rise time budget parameters.

According to the result of FTTH network design with GPON technology in Newton Apartment (Newton Residence) Bandung, the OLT which placed on STO, using 1 OLT, 3 ODC, 80 ODP, 875 ONT, 3.45 Km G.652 72 core fiber optic, 3 Km G.657 4 core, 62 Km G.657 1 core, 41 *passive splitter* 1:2, 80 *passive splitter* 1:16, and 2269 connector. For the OLT placed in Apartment, using 1 OLT, 3 ODC, 80 ODP, 875 ONT, 3.45 Km G.652 4 core fiber optic, 3 Km G.657 4core, 62 Km G.657 1 core, 41 *passive splitter* 1:2, 80 *passive splitter* 1:16, and 2269 connector. Based on the calculation, the Power Link Budget when OLT placed in STO, the downlink is α_{tot} = 24.286 dB, Prx= – 25.286 dBm and power margin acquired is 3.714 dBm, for uplink, α_{tot} = 24.81 dB, Prx= – 25.81 dBm and power margin 3.19 dBm are acquired. From Power Link Budget calculation when OLT placed in Apartment, for downlink, the value of α_{tot} = 24.42 dB, Prx= – 21.42 dBm and power margin is 7.58 dBm, for uplink, the values acquired are α_{tot} = 24.46 dB Prx= – 21.46 dBm, and power margin is 7.54 dBm. It means that the link design could meet the power link budget feasibility set by PT Telkom, with the maximum value of α_{tot} =25 dB and ITU-T 28 dB. From the Rise Time Budget calculation when OLT placed in STO, for downlink, the rise time budget total is 0.25892 ns and for the uplink is 0.250252 ns. For the OLT that placed in the apartment, for downlink the rise time total is 0.2501 ns and for uplink is 0.2500 ns. It means that the link design that mention above could meet the rise time budget feasibility with NRZ code because the result still below the maximum limit of Tsystem maximum NRZ, which is 0.2917 ns for downlink and 0.5833 ns for uplink.

Keyword : FTTH, GPON, *Power Link Budget, Rise Time Budget, dan NRZ.*