ABSTRACT

Rapid technological developments led to the development of transmission technology is also evolving. The current transmission technology makes it possible to transmit information with speed and large capacity. Therefore, with the emergence of a model of telecommunication network called standard 3GPP LTE (Long Term Evolution) or so-called LTE with speeds up to 100 Mbps data rate on the downlink direction and 50 Mbps for the uplink direction, the need for technology that can support the needs of the datarate and high capacity LTE network, then the required network interface (backhaul) adequate and with the minimum possible cost.

In this final project, discussed the comparative analysis of LTE network backhaul using microwave and fiber optics, as well as a link budget calculation, fading prediction, link power budget and rise time budget. At this final point after eNode B obtained from a previous study, carried out a comparative analysis of network usage as well as microwave and optical backhaul LTE network has been designed previously.

Backhaul is designed using microwave and fiber optic access, with a capacity of 152.46 Mbps each node. After performing various calculations and simulations, microwave planning using a tree topology with 50 hop backhaul for 51 eNode B. Antenna height 30 m, 16.5 dBm transmit power, and average received power level is -43,3 dBm, average BER 10^{-6}. In planning to use fiber optic ring-star topology with 6 rings and 56 hop backhaul, with 0 dBm transmit power levels obtained an average received power of -21,33 dBm, the average t_{system} 248,057758 ps and the average BER $2{,}5959 \times 10^{-18}$ using RZ or NRZ line coding. Judging from BER and power level parameters receipt, then the use of optical networks is better to use as a backhaul network.

Keywords: backhaul, microwave, fiber optics, LTE, link budget, rise time budget