

## ABSTRACT

The need to access broadband Internet usage is currently increasing. Existing broadband access methods such as ADSL has a short transmission distance, access with limited bandwidth, low security level, unguaranteed QoS and other issues that make the technology increasingly unable to fulfill the needs of users. Therefore, GEAPON (Gigabit Ethernet Passive Optical Network) can be one solution that can solve these issues. GEAPON's speed with a symmetric downlink and uplink can achieve 1 Gbps with a maximum distances up to 20 km. With great speed access, broadband access needs can be properly fulfilled.

GEAPON relatively is one of new technology in Indonesia. One of the companies that implements GEAPON to provide Internet services in FTTH networks are PT. Cendikia Global Solusi. In this Final Assignment GEAPON technology implementation is done by giving bandwidth allocation and did a research on network performance when given traffic by *traffic generator* and when running FTP and VoIP applications (voice and video).

From the results of current research when the traffic is given by *traffic generator* the value of throughput is almost same with bandwidth that allocated before, even more. In FTP applications also almost same but there is limited throughput around 20 Mbps, this is not because of network conditions but rather because FTP server only can deliver a maximum speed around 20 Mbps. As for the retransmission percentage obtained value from 0.03% to 3.03%, delay RTT value obtained from 0.3248 ms to 5.7203 ms. In voice service the bitrate value is 20530.99 bps, without packet loss, delay 29.0169 ms and jitter 4.5988 ms. While the video service bitrate value is 384,414.707 bps, with 0.0014% packet loss, delay 33.5466 ms and jitter 15.2362 ms.

**KEY WORDS :** GEAPON, bandwidth allocation, traffic generator, FTP, VoIP