

## ABSTRACT

Nowadays, the optical network has been dominating the access of network rooms because it is able to give all kind of services such as IPTV, VoIP, and internet data basses in *bandwidth* and larger *bit rate*. *Ethernet Passive Optical Network* (EPON) is one of technology that can give those application services in only *single fibre optic*.

EPON is some kind of optical network *point-to-multipoint* that has 1 Gbps speed for *upstream* and *downstream* transmission. For allocating *bandwidth* in an upstream transmission to every ONU, then EPON uses mechanism from *Multipoint Control Protocol* (MPCP). That *upstream bandwidth* is divided again to become several *bandwidth* units by using *Time Division Multiplexing* (TDM). Those units which allocated by ONU, are decided by OLT by using *Dynamic Bandwidth Allocation* (DBA) *algorithms*. *DBA algorithm* supplies *statistical multiplexing* for each ONU, with explanation if there is one ONU that doesn't have some data to be transmitted, then *timeslot* which has been allocated for one ONU can be used by other ONU with some class priority. *Statistical multiplexing* defines maximum size of a *frame* which has some permission by ONU so that every ONU can have a chance to transmit its data.

The main purpose of this final task is for knowing the performances of *DBA algorithms* mechanism to some *scheduling discipline* that has been determined to every ONU such as *fixed*, *limited*, and *elastic services*. The performances that I would like to analyze in this final task are *delay*, *average queue size*, *packet loss*, and *throughput*.

The result of this final task analytical is for showing that *elastic* and *limited services* are much permitted to be used for VoIP service and multimedia. The reason is because both services are able to fulfil the needs of each Qos parameter from VoIP service and multimedia based on ITU G. 114 and G. 107 standards. However, *fixed service* can not fulfil the ITU standard because of having high *burst delay* on every *load area* (even on a *low load area*).

**Key words: DBA algorithm, EPON, IPACT, *fixed*, *limited*, and *elastic services*, ITU-T, QoS.**