ABSTRACT

The majority of the optical fiber access network is currently dominated by Gigabit Passive Optical Network (GPON) technology, which is able to provide various services such as video, voice, and internet data in the network. Time Division Multiplexing (TDM) is used to control the upstream bandwidth and divide it into smaller units on each Optical Network Termination (ONT). This allocation mechanism use Dynamic Bandwidth Allocation (DBA). DBA provides a statistical multiplexing algorithm for each ONT where the Optical Line Terminal (OLT) will allocate a timeslot that is not used to another ONT with a particular priority. Statistical multiplexing set the maximum permitted length of frame to be transmitted so all ONTøs have equal opportunities in the delivery of data.

Development of the DBA algorithm was done by adding or modifying one or more parameters to get better results. Bipartition Dynamic Bandwidth Allocation divides one transmission cycle time into two groups and dynamically adjust the bandwidth between the groups with other groups in order to minimize idle time. The maximum transmission time of the two groups should not exceed the standard of maximum cycle time on GPON. The division of the transmission time will affect the network performance especially the performance of delay.

We proposed to modify Group Based Bipartition DBA into Multi partition DBA by adding partition into four groups. Simulation was conducted using matlab to compare the performance of delay from Multi Partition DBA with previous method for two different traffic proportions. Multi partition DBA can improve 11% for average total delay performance for both traffic proportions because the addition number of partitions can resolve the idle period and makes DBA Time more effective which will reduce the total delay.

Keywords : *DBA, GPON, Bipartition, Multi partition*