

## ABSTRACT

The Fiber To The Home (FTTH) communication with optical network media is not so expensive anymore. Personal users can now use the fiber transmission media to pass the triple-play services, for video, internet data, and telephone. These three services have different characteristics in terms of consumption of bandwidth demand. Therefore, it needs different scale setting on the data sent for each service in which the optic technology did not apply the fairness standardization yet among the delivered services.

Previous researches tried to maintain the fairness among the users with Optical - Orthogonal Frequency Division Multiplexing (O-OFDM) + Time Division Multiple Access (TDMA) in which there were two offered main techniques, namely burst and circuit modes. Fairness among different users has been set up through the service level agreement for each user. However, triple-play subscriber need to optimize their bandwidth allocation within different services.

The importance of maintaining fairness among the services with this FDMA is to provide the portion of bandwidth for every service as needed. By giving different portions scale, it is expected that the services will get better throughput. This research simulated on different numbers of users with the scenario when the number of user is normal and when the number and consumption of bandwidth of these users exceed the provided line-rate. It proposed to modify current burst methods to scheduling distribution SubCarrier (SC) on system OFDM from Optical Line Termination (OLT) to Optical Network Unit (ONU) by utilize FDMA to allocating SubCarrier based on the services.

The result shows that the proposed system can improve the BW efficiency by 36.17% during congestion. The proposed system, in addition, can increase the number of users that need HD video quality by 66%.