ABSTRACT

Communication technology has developed very fast. Third Generation Partnership Project (3GPP) has introduced LTE as the next generation of mobile networks which can fullfill the demand of mobile communications. With the increasing demand for faster access, the new system was developed. LTE-Advance system (LTE-A) was released by the fourth generation (4G) mobile system. 3GPP introduced a new technology using Carrier Aggregation (CA) to support wider transmission bandwidth and spectrum efficiency. CA becomes the new standard LTE-Advanced system.

With the CA systems, each user can be scheduled on different number of multiple carriers. Because of the differences for each carrier frequency, then the fading characteristic and coverage for each of the carrier are different. Fairness in the resources block allocation can not be achieved with conventional proportional fair (PF) scheduling algorithm, because the PF algorithm assumes all users can be scheduled on the same number of carrier. The modified PF algorithm was made by grouping the user according to the number of carriers that can be given to the user first. There are user grouping-PF (UG-PF) algorithm, which adds distance ratio in the allocation process, and modified user grouping-PF (mUG_PF) algorithm that divides the user and RB in some specific group.

In this final project parameters measured were average user throughput and fairness. From the simulation results, modified PF algorithm (UG-PF and mUG-PF) obtain a better fairness. In mUG-PF this parameter rose by 0,017-0,109, and in UG-PF system fairness rose by 0,015-0,073 compared to conventional PF algorithm. Meamwhile on the other side, the average user throughput in UG-PF algorithm decreased 306-1720 kbps and algorithms mUG-PF decreased by 715-4260 kbps compared with conventional PF algorithms.

Keywords: *Carrier aggregation, User grouping, Proportional fair, LTE-Advanced*