

ABSTRACT

The development of information and communication technology has entered the fourth generation. Third Generation Partnership Project (3GPP) has introduced LTE (Long Term Evolution) as a generation of mobile networks that will meet user demands for greater data needs than previous generations. LTE is capable of providing data rates up to 100Mb / s for downlink and 50Mb / s for uplink. The accelerated variation in data access requests, then it must be supported by more effective and efficient services by optimizing the existing service schemes. One of the problems in LTE is the allocation of Physical Resource Block (PRB). PRB is a unit in mobile communication system that must be allocated to the user. The allocation process must be managed effectively, so that each user can be served by ensuring the Quality of Service (QoS) of the user.

In this final project, research is held on the performance of PRB allocation and optimal power usage to user. The algorithm used for PRB allocation is QoS Guaranteed. Power will be allocated using the waterfilling scheme and will be applied with the 2x2 MIMO 2M2 Multiple Input Multiple Output configuration.

Based on the simulation results, the scheme using waterfilling technique has a better fairness index system compared to the scheme without waterfilling technique, but it has poor performance in average user throughput and spectral efficiency. The scheme that use waterfilling has an average fairness value of 0,62 from all scenarios. The average user throughput and spectral efficiency get maximum on a scheme that use MIMO without waterfilling power allocation technique, the value of spectral efficiency is 0,83 bps/Hz in user scenarios, 0,75 bps/Hz in PRB scenarios, 0,84 bps/Hz in distance scenarios.

Keywords: LTE, QoS Guaranteed, Waterfilling, (Multiple Input Multiple Output) MIMO