

OFDMA (*Orthogonal Frequency Division Multiple Access*) is a multiple access technique with the resistance to multipath and able to achieve high data rate with minimum power transmit. Data transmission scheme of OFDMA also used for downlink LTE.

Maximum C/I dan Proportional Fair algorithms are scheduling methods for resource allocation based channel which are often used for OFDMA downlink system. Each of the algorithms have advantages and disadvantages from throughput and fairness point of view. Maximum C/I algorithm allocated the resource for user with the best channel condition, it will disadvantage other users with the worse channel condition. Proportional Fair algorithm allocated the resource fairly, it affects the system capacity which lower than Maximum C/I algorithm. Research propose a new method to achieve thrade off between throughput and fairness, that is M-LWDF algorithm based channel and buffer (traffic) information.

In this final project an OFDMA system designed using M-LWDF conventional algorithm whereas each user has one buffer and M-LWDF unconventional algorithm whereas data packet placed randomly toward buffer. There's also design system using Maximum C/I dan Proportional Fair algorithms. Using multipath fading Rayleigh channel model with log normal shadowing distribution with deviation standard 8 dB and each user distances randomly from BS with range 1-5 km. Traffic model used erlang C model with probability of blocking 0,001 and service rate 1 packet/TTI. The simulation was done with variety of the number of user, such as 5, 10, 15, 20 users.

Average throughput per user produced by M-LWDF conventional/ unconventional were more spread evenly than average throughput per user produced by Maximum C/I dan Proportional Fair algorithms. System throughput of Maximum C/I dan Proportional Fair algorithms almost have the same pattern with each other, though system throughput of Maximum C/I always better than Proportional Fair. System throughput of Maximum C/I was better than M-LWDF conventional algorithm with the difference of 976,81 Mbps (69,8%). System throughput of M-LWDF conventional was better than Proportional Fair algorithm with the difference of 336,48 Mbps (46,6%). System throughput of M-LWDF unconventional was the lowest from others. System fairness of M-LWDF conventional always better than Maximum C/I dan Proportional Fair, system fairness of M-LWDF unconventional was unstable following system throughput value. Though system fairness of M-LWDF unconventional was better than Proportional Fair algorithm with the difference of 99,2%.

Keywords : OFDMA, Maximum C/I, Proportional Fair, M-LWDF, subcarrier allocation, buffer, channel state information