

ABSTRACT

Heterogeneous networks of LTE using relay nodes are technology that can overcome the problem of affordability across regions and traffic needs. Heterogeneous networks is the combined network of various access technologies and cell types that help each other to provide better service to users. The research was conducted in several stages, analysis of the existing conditions, planning of the relay node based on coverage and capacity, simulation testing, and the last is analysis phase of simulation. Placement of relay nodes must be done with 10 iterations. The function of iteration is for get the value that close to distribution value from all simulation. The iterations or repetitions carried out in this study are shown in 3 experimental scenarios. The final results of the simulation are taken from an average of 10 simulations. To place relay nodes in order to get effective results, it is necessary to identify traffic density, determine relay node capacity, offload traffic, and minimizing interference from macro cell to relay nodes. There is a technology called cell range extension whose function is to move users from macro cells to small cells. To avoid interference between the macro cell and relay node, ICIC FDM is applied. The results indicate that with the addition of relay nodes with individual cell offset of 0 dB the number of non-served customers decreased by 10.07%. But the biggest traffic transfer is obtained when the relay node uses an individual cell offset of 15 dB. In this condition there is an increase in the number of users by 14.35% on the relay node and there is a decrease in the number of users by 92.8% in marco cells.

Keywords: *Heterogeneous networks, LTE, relay node.*