

ABSTRACT

LTE-Advanced is an IP-based technology that is issued by 3GPP as the standard for high-speed wireless data communications. High user mobility, unequal user distribution, increased coverage and cell throughput is a challenge that must be faced by operators to planning LTE-Advanced network in an area. One of the solution to faced these challenges is performing heterogeneous network planning. The heterogeneous network is an implementation of a mobile network by putting a small cell in the macro cell.

This final project plan the LTE-Advanced heterogeneous network of small cells using 1800 MHz frequency in Bandung. The analysis was performed by reviewing three cells that represent the sub-urban areas, urban, and dense urban with the highest number of users using two scenarios: cells with the addition of small cell 802.11n Wi-Fi at a frequency of 2.4 GHz and small-cell cell without the addition of Wi-Fi 802.11n as a comparison of performance heterogeneous network planning. Planning is done using a calculation based to coverage planning and capacity planning approach.

In this heterogeneous network planning, sub-urban areas served by a 4-cell, urban areas served by 6 cells, and dense urban areas served by 9 cells. The implementation of heterogeneous networks can produce good RSRP value with the value $RSRP \geq -100$ dBm for 90% of total area. Heterogeneous network increasing 25 % network throughput and increase the network capacity because of traffic offloading from the LTE-Advanced network to Wi-Fi 802.11n network, so it can handle the increasing user. While the results of the simulation, maximum performance occurs when the user on fixed condition with 99% user connected. From these results the implementation of small cell Wi-Fi 802.11n on LTE-Advanced heterogeneous network is worth to implemented.

Keywords : LTE-Advanced, Heterogeneous network, Small cell, Throughput