

ABSTRACT

In indoor network communication a technology called Femtocell is known as a development of the concept of macro cell architecture on cellular networks that uses low power levels and has a smaller scope. The use of femtocell is in the form of a Femtocell Access Point (FAP) device that is placed inside a building that aims to increase coverage and capacity on an indoor network. To support the communication process in the indoor scope a network design is needed. In this study, the researchers made the design of the LTE indoor femtocell network in Gedung IoT IT Telkom Purwokerto on floors 1,2, and 3 with a building area of 1800 m² based on the COST-231 Multi Wall Indoor propagation model which was simulated using Radiowave Propagation Simulator version 5.4. In this design two work frequencies were used as comparison material, namely 1800 MHz FDD and 2300 MHz TDD with 20MHz bandwidth. Comparisons made on this design are divided into two design methods, namely based on coverage and capacity. To determine the number of FAP, a link-budget calculation is required, based on the calculation of coverage needed by 6 FAP at the frequency of 1800 MHz and 9 FAP at the frequency of 2300 MHz, based on capacity, 4 FAP is needed. The design uses 3 FAP placement scenarios to get the maximum design results by considering the network performance parameters namely RSRP (Received Signal Received Power) and SINR (Signal to Interference Ratio). From the simulation results, the best scenario is design based on capacity at 1800 MHz frequency using scenario 2 (FAP is positioned parallel to the center of the building) resulting in an average RSRP value of -59.77 dBm and SINR average value of 14.15 dB .

Keywords : *Indoor Network, LTE, Femtocell, Radiowave Propagation Simulator*