

Abstract

The challenge of providing reliable wireless communication networks with high system capacity can not be separated from the high investment costs. The efficient utilization of spectrum resources are as much as possible is one solution to overcome the high investment costs. The purpose of the research done by conducting a capacity analysis study of the optimization of existing 2G/3G networks and LTE networks by engineering the Joint Base Station (JBS) by making use of spectrum resources efficiently and in accordance with percentage subscriber growth rate of wireless voice and data services (2012 - 2017) on one of the telecommunication operators in Indonesia. The method of study is to conduct technical implementation *Joint Base Station* (JBS) with four scenarios of implementation, ie *2G/3G Collocation*, *2G/3G/LTE Collocation*, *3G/LTE Collocation*, and LTE (JBS).

In this tesis will be analyzed in the economy of the implementation techniques *Joint Base Station* (JBS) in one of the 2G/3G existing networks and new LTE network operators (one of the telecommunication operators in Indonesia). Analysis model is used based on the principle of economic technocrats using *Capacity and Coverage Estimation Analysis* to determine the engineering design of the *Joint Base Station* (JBS) and *Replacement Analysis* method to analyze the economic feasibility and measure the costs incurred for the implementation of the technique *Joint Base Station* (JBS).

The conclusions of the technical research conducted *Joint Base Station* (JBS) is one solution for telecom operators in Indonesia in the optimization of existing capacity of wireless networks (2G and 3G) and new networks (LTE) that are reliable, the *Joint Base Station* implementation techniques (JBS), can be recommended scenario implementation LTE (JBS), which produces larger network capacity than the other three scenarios of its implementation (*2G/3G Collocation*, *2G/3G/LTE Collocation*, *3G/LTE Collocation*).

Keywords: Wireless Communication, *Joint Base Station* (JBS), Resource spectrum, *2G/3G Collocation*, *2G/3G/LTE Collocation*, *3G/LTE Collocation*, LTE (JBS), Replacement Analysis, Capacity and Coverage Estimation Analysis