

ABSTRAK

Pesatnya perkembangan teknologi dalam dunia telekomunikasi meningkatkan kebutuhan akses data yang handal agar pertukaran informasi bisa lebih cepat dan stabil. Meningkatnya kebutuhan layanan data mendorong terbentuknya inovasi dalam layanan akses *broadband*. Salah satunya adalah teknologi terbaru yakni *LTE-Advanced*. *LTE-Advanced* merupakan teknologi 3GPP *release 10* yang berbeda dengan LTE pada 3GPP *release 8*, dimana penggunaan *bandwidth* dimaksimalkan melalui *Carrier Aggregation (CA)*. Perencanaan jaringan *LTE-Advanced* di Kota Bandung dengan metode *carrier aggregation intra-band contiguous* menggunakan *band* frekuensi yang sama. Dalam frekuensi tersebut terdapat dua buah *carrier* yang saling kontinyu untuk meningkatkan kapasitas jaringan. Perencanaan dilakukan berdasarkan pendimensian *capacity* dan *coverage* serta simulasi pada software. Parameter yang dianalisis dalam simulasi adalah *Level Signal*, *CINR Level*, *Connected User* dan *Throughput* yang akan dibandingkan dengan perencanaan tanpa *carrier aggregation*. Berdasarkan *capacity planning*, perencanaan jaringan *LTE-Advanced* dengan menggunakan *carrier aggregation* lebih efisien dengan hanya membutuhkan 51 site untuk memenuhi kebutuhan trafik. Sedangkan dalam *coverage planning* kedua perencanaan menghasilkan jumlah site yang sama dengan 69 site untuk dapat mencakup seluruh area tinjauan. Pada hasil simulasi, didapatkan nilai rata-rata *level signal* sebesar 80,69 dBm, *CINR Level* 5,41 dB, *user connected* 68,15% dan *throughput user* sebesar 1552,76 Mbps untuk jaringan *LTE-Advanced* dengan *carrier aggregation intra-band contiguous*. Sementara untuk perencanaan tanpa *carrier aggregation* menghasilkan nilai rata-rata 80,93 dBm, *CINR Level* 4,21 dB, *user connected* 60,25% dan *throughput user* sebesar 694,22 Mbps. Berdasarkan hasil penelitian yang didapat, perencanaan jaringan *LTE-Advanced* dengan metode *carrier aggregation intra-band contiguous* lebih baik dibandingkan perencanaan jaringan LTE tanpa *carrier aggregation* dan layak dipertimbangkan oleh operator-operator telekomunikasi untuk dapat diimplementasikan.

Kata Kunci: *Carrier Aggregation, LTE-Advanced, Signal, Throughput*



ABSTRACT

The rapid technological developments in the telecommunications world increase the need for reliable data access in order to exchange information can be faster and more stable. The growing need for data services to encourage the formation of innovation in broadband access services. One is the latest technology that *LTE-Advanced*. *LTE-Advanced* technology is the 3GPP *release 10* different with the 3GPP *Release 8* LTE, which maximize the use of bandwidth through a *Carrier Aggregation (CA)*. *LTE-*

Advanced network planning in Bandung with the method of intra-band carrier aggregation contiguous using the same frequency band. In these frequencies, there are two mutually continuous carriers to increase network capacity. Planning is based capacity and coverage dimensioning as well as a simulation with software. Parameters analyzed in the simulation is a Signal Level, Level CINR, Connected User and throughput will be compared with planning without carrier aggregation. Based on capacity planning, network planning using the LTE-Advanced carrier aggregation is more efficient only need 51 sites to meet the needs of traffic. Whereas in the second planning coverage planning produce the same number of sites to 69 sites to cover the entire area of the review. In the simulation results, obtained an average value of 80.69 dBm signal levels, CINR Level 5.41 dB, the user connected user of 68.15% and throughput amounted to 1552.76 Mbps for LTE-Advanced network with intra-band carrier aggregation contiguous, As for planning without carrier aggregation resulted in the average value of 80.93 dBm signal levels, CINR Level 4.21 dB, the user connected 60.25% and size of throughput 694.22 Mbps. Based on the results obtained, LTE-Advanced network planning method of intra-band carrier aggregation contiguous better than LTE network planning without carrier aggregation and worthy of consideration by the telecom operators to be able to implement it.

Keyword: Carrier Aggregation, LTE-Advanced, Signal, Throughput

