

ABSTRAK

Terjadinya peningkatan dan pertumbuhan layanan data secara global seiring peningkatan penggunaan *Smartphone (iPhone, BlackBerry phones and Android phones)* dan perangkat pintar lainnya (*PDA, Tablet PC, Notebook*) mengakibatkan *trend* akses layanan informasi dan data di Indonesia ikut meningkat terutama akses data di jaringan *3G Mobile Broadband*. Keterbatasan infrastruktur jaringan 3G di Indonesia seperti *BTS (Base Transceiver Station) Mini, Femtocell, Picocell* mengakibatkan akses data oleh *user* yang berada di suatu gedung dan di tempat umum pada jam sibuk menjadi terhambat dikarenakan adanya kepadatan trafik data. Salah satu solusi untuk mengatasi permasalahan tersebut adalah dengan *Traffic Offload / Mobile Data Offload (Seamless Connectivity)* yaitu trafik data di jaringan 3G dialihkan melewati jaringan WiFi (*Wireless fidelity*) karena WiFi mampu memberikan akses data dengan kecepatan yang lebih tinggi, menambah kapasitas jaringan dan infrastruktur WiFi yang dapat dipergunakan secara bersama.

Pada penelitian ini dilakukan analisis dan simulasi *Traffic Offload Data* antara 3G dan WiFi dengan menggunakan *Software MATLAB R2013b*. Analisis dilakukan dengan mengamati parameter *Received Signal Strength, handover user dan drop user, Handover Delay, dan Throughput*.

Dari hasil penelitian didapatkan *Received Signal Strength (RSS)* yang tepat untuk melakukan *Offloading* dari jaringan 3G ke jaringan WiFi yaitu pada *RSS 3G* sebesar -84 dBm dan *RSS WiFi* -69 dBm sehingga diperoleh *handover user* sebesar 260 *user* dan *drop user* 240 *user* pada kecepatan *user* 50 m/s. Dan *RSS* yang tepat untuk *Offloading* dari jaringan WiFi ke jaringan 3G yaitu pada *RSS 3G* sebesar -91 dBm dan *RSS WiFi* -76 dBm sehingga diperoleh *handover user* sebesar 138 *user* dan *drop user* 111 *user* dengan kecepatan *user* 50 m/s. Untuk *handover user* sebanyak 245 *user* diperoleh *handover delay* 40,05 *milisecod* dan *throughput* yang diperoleh *user* di jaringan 3G 2 Mbps pada jarak 0,1 km dari *Node B* dan *throughput* di jaringan WiFi 2,9 Mbps pada jarak 50 meter dari *Access point* WiFi (1,5 km dari *Node B* 3G).

Kata kunci : 3G, WiFi, *Traffic Offload, Seamless Connectivity, Mobile Data Offload*.

ABSTRACT

The explosive growth of data services globally resulted in a trend of information services and data has occurred also in Indonesia as the increased use of smartphones (iPhone, BlackBerry phones and Android phones) and other smart devices (PDA, Tablet PC, Notebook) which uses access Data on 3G Mobile Broadband network. 3G (third-generation technology) Mobile Broadband is high-speed Internet access that is provided by the service provider. In addition, the 3G network infrastructure such as BTS (Base Transceiver Station) Mini, femtocell, picocell is still limited and consequently still in the process of making data access by users who are in the building and in public places during rush hour traffic to be blocked due to density data. Then Traffic Offload / Mobile Data Offload (Seamless Connectivity) could be one solution for addressing the explosion in data traffic, data traffic on the 3G network transferred over the network WiFi or Wireless Fidelity with the Traffic Offload (3G-WiFi Offload) because WiFi is able to provide access data at higher speeds, increasing network capacity and Infrastructure WiFi that can be used together.

In this research, analysis and simulation of Data Traffic Offload between 3G and WiFi used software MATLAB R2013b. The analysis is done by observing the received signal strength, handover user, drop user, handover delay and throughput.

From the results of this research we have know the Received Signal Strength (RSS) that is appropriate to perform offloading from 3G to WiFi networks are RSS 3G = -84 dBm, RSS WiFi = -69 dBm so that we get 260 handover users and 240 dropped users on user velocity 50 m/s. And offloading from WiFi to 3G networks are RSS 3G = -91 dBm, RSS WiFi = -76 dBm so that we get 138 handover users and 111 dropped users on user velocity 50 m/s. For 245 handover users we get handover delay = 40,05 milisecod and user throughput = 2 Mbps in 3G network at 0,1 km from 3G Node B and user throughput = 2,9 Mbps at 50 meter from WiFi access point (at 1,5 km from 3G Node B).

Keywords : 3G, WiFi, Traffic Offload, Seamless Connectivity, Mobile Data Offload.