

ABSTRACT

SECURITY SYSTEM AND ELECTRICAL EQUIPMENT CONTROL OF SMART BUILDING WITH SHORT MESSAGE SERVICE (SMS)

By

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A smart building has a computer-aided system to control most of home appliances in which the commands can be executed by using sound, infrared rays, or by remote control. In this work, a prototype of smart building which is controlled by short message service (SMS) was developed. The SMS-based remote control requires several times to transfer the data, the faster data is transferred, then the faster response can be performed, particularly for something related to the security system. This work focused on analyzing the SMS traffics in the High Speed Packet Access (HSPA) network. Some traffic's parameters such as pathloss, probability of packet loss, and blocking probability are concerned. The Ikegami Walfisch NLOS model is used for analyzing the pathloss. Based on the developed prototype system, the average value of transferred time of SMS packet is 10 seconds, the middle value is 9 seconds, and the recurring value is 7 seconds. Based on the results, it can be found that the blocking probability depends on the number of servers, the higher number of servers the lower of blocking. In this work, two servers resulted of 0.0388, whereas 7 servers resulted zero blocking. The probability of packet loss is proportional to the distance between the Base Transceiver Station (BTS) to the mobile device, and also influenced by the modulation model. The distance of 0.2 Km generated the probability of packet loss of $1,26046 \times 10^{-9}$ for 16QAM $\frac{1}{2}$ modulation, $6,1446 \times 10^{-10}$ for 16QAM $\frac{3}{4}$, $2,90402 \times 10^{-3}$ for 64QAM $\frac{2}{3}$, and $1,22359 \times 10^{-3}$ for 64QAM $\frac{3}{4}$. Meanwhile for the distance of 2 Km the generated probability of packet loss are $1,584487 \times 10^{-3}$ for 16QAM $\frac{1}{2}$ modulation, $7,59277 \times 10^{-4}$ for 16QAM $\frac{3}{4}$, $5,2819912 \times 10^{-1}$ for 64QAM $\frac{2}{3}$ and $2,1486057 \times 10^{-1}$ for 64QAM $\frac{3}{4}$.

Keywords : *sms traffic, HSPA, Ikegami Walfisch NLOS model, blocking sms, the probability of packet loss.*