UNIVERSITI TEKNOLOGI MARA

EXP-BET PACKET SCHEDULING ALGORITHM FOR MULTIPLE TRAFFIC SERVICES IN LONG TERM EVOLUTION (LTE) SYSTEM

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of the requirement for the degree of
Master of Science

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CONFIRMATION BY PANEL OF EXAMINERS

I certify that a Panel of Examiners has met on 27th May 2016 to conduct the final examination of Ku Siti Syahidah Binti Ku Mohd Noh on her Master of Science thesis entitled "EXP-BET Packet Scheduling Algorithm for Multiple Traffic Services in Long Term Evolution (LTE) System" in accordance with Universiti Teknologi MARA act 1976 (Akta 173). The Panel of Examiners recommends that the student be awarded the relevant degree. The Panel of Examiners was as follows:

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Most mobile devices today support multimedia services and legacy mobile services such as voice, short message service (SMS) and multimedia messaging service (MMS). Real-time services like video streaming and multimedia gaming are given higher priority when scheduled as compared to non-real-time services like web browsing and sending emails. However, both real-time and non-real-time services have equal demand which means that the urgency for such services to be scheduled cannot be neglected. Due to the different traffic characteristics and Quality of service (QoS) requirements of real-time and non-real-time services, the provision of the QoS requirements has become a challenge. It is found that packet scheduler can be used to fulfill the required QoS by services. An efficient packet scheduler in allocating resources to active flows is very important since it will affect an individual user's throughput and fairness. Thus, it is important to choose an optimal packet scheduler scheme to be used in order to schedule this active flow. In this thesis, the comparison of proposed algorithm namely the Exponential Blind Equal Throughput (EXP-BET) was made with the Exponential Proportional Fairness (EXP-PF) and Frame Level Scheduler (FLS) algorithms. The aim of this thesis is to determine the suitable packet scheduling algorithm in order to schedule the multiple services and ensure fairness regardless of the user's location in a cell. The simulation process has been done using the LTE-Sim simulator and the performance of these packet scheduling algorithms were evaluated based on the performance metric of fairness index, throughput, packet loss rate and delay for VoIP, video and best effort flows. From the simulation results, it was observed that EXP-BET delivers higher fairness and throughput and lower PLR and delay for real-time services. Instead, EXP-BET shows 17.72% improvement than FLS and 7.52% from EXP-PF in term of fairness index for the non-real-time services.

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