

UNIVERSITI TEKNOLOGI MARA

**AN ENHANCEMENT HANDOVER
SCHEME BETWEEN MACROCELL
AND FEMTOCELL IN LTE
HETEROGENEOUS BASED
NETWORK**

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April 2017

ABSTRACT

Long Term Evolution (LTE) is the new technology that has become one of the important parts of every day's life and for the future consisting of heterogeneous networks. LTE is among the available standard for wireless communication of high speed data and the latest technology that is currently used. In order to satisfy the seamless handover in LTE, extensive research on femtocell network which acts as a Home eNodeB (HeNB) has been carried out with the existing networks that can fulfill the upcoming demand of high data rate and extend the coverage area in wireless communication system. The deployment of femtocells also can offload traffic from the LTE macrocell to be managed by the femtocell network. Seamless handover process between macrocell and femtocell base stations is a major challenge of LTE femtocell-macrocell integrated system because efficient handover is needed which is can transfer User Equipment (UE) between femtocell and macrocell. The challenge now is to provide seamless handover initiation scheme and better signal strength to user due to the different LTE heterogeneous network. The main objectives of this research is to formulate analytical framework on the dynamic boundary area size by incorporating the value of user's speed and type of handover in adaptive Receive Signal Strength (RSS) threshold. Under this framework, the probabilities of intra and inter handover were analyzed in order to observe the relationship between both handover when the speed of user are increased. This research also investigates the handover performance when the femtocells are deployed on the macrocell heterogeneous network. Next, the LTE femtocell-macrocell integrated network scheme with deployment of femtocells for hand-in and hand-out handover process is being discussed. The numerical results shows that the proposed framework improves the number of handover failures up to 80%. The simulation results also show a significant reduction in number of the handover calls rate with the proposed scheme up to 70% compared to traditional handover (TH) which can be used to manage the overloaded traffic in the LTE heterogeneous network.