

**Performance Analysis of Handover in LTE (Long Term Evolution) Femtocell
Network**

**Thesis presented in partial fulfillment for the award of the
Master of Science in Telecommunication and Information Engineering
UNIVERSITI TEKNOLOGI MARA**



**MOHD HAFIZ BIN ABU BAKAR
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM SELANGOR
MALAYSIA**

ACKNOWLEDGEMENT

IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

Assalamualaikum. Thanks and I am so grateful to Allah s.w.t for blessing me every day health and giving me the strength to complete this project and thesis successfully. I wish to express my deepest gratitude and sincere appreciation to my supervisor, Prof Dr. Hj. Mohd Dani Bin Baba for the encouragement, guidance, critics and friendship and for his tireless effort in assisting and guiding me in completing this project. The project would not have materialized if not for his assistance, dedication and support.

A special thanks to Sinan for his guidance and support for me in order to completing this project by giving his time and effort to guide on how to use the LTE Sim Network Simulator tool.

A very special appreciation to my family, and all my friends, especially to Nur Saidatun Sheila Talib for their invaluable support when I need it the most, along the duration of my studies and until this thesis is successfully completed.

Last but not least, I should render my thanks to the people who have directly and indirectly contributed to the successful completion of this thesis.

ABSTRACT

The latest technology in wireless communication system is Long Term Evolution (LTE) Femtocell with one of the purpose of this technology is to enhance indoor coverage by using 'plug and play' approach by the user as the operation of this technology. LTE technology are expected to conquer the telecommunication industry services of mobile network as it upgraded from circuit switches to packet switches and also moving forward from voice to data. This technology was said to give lots of benefit beyond 3G mobile towards system operator and the benefit itself in terms of economy. With the expectation to provide higher throughput and lower transmission latency to the mobile user, the LTE technology is known as technologies towards next generation mobile broadband standard and Femtocell is one of network that having a lot of benefit and advantages for users and operators. Handover for emerging technologies can be define by this function which also let network operators gets some benefit from it by adding to its value [1]. This study is on Performance Analysis of Handover in LTE (Long Term Evolution) Femtocell. In order to analyze the handover performance in LTE, four scenarios are investigated with three Femtocells (without handover), with three Femtocells (with handover), with five Femtocells (without handover) and with five Femtocells (with handover). This paper will explore the entire scenario by using LTE-Sim network simulator. This paper begins with a brief history and an overview of LTE (Long Term Evolution) technologies.

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CHAPTER 1

INTRODUCTION

This chapter presents briefly on 4G telecommunication network and also mention about the objectives, problem statement and research contribution of this thesis.

1.0 BACKGROUND

Nowadays, the increasing of demand from mobile devices for internet access was great that make telecommunication industry services to go beyond its recent technology, starting from 1G to 2G then 3G and now 4G technologies. All this generation of technology offered faster , reliable and safer connectivity as the wireless network was introduces which the data transfer were upgrade from analog to digital. There are such a challenges to face in order to provide user with truly and fully connectivity. The wireless telecommunication industry put a pull effort to fulfill the demands by increase a system capacity, provide a better framework for broadband high mobility and better performance for cell edge. The industry also concern to reduce latency and improve the efficiency of spectral to overcome the problem that might occur [2].

With the intention to fulfill the demand from the user and also to make the telecommunication technology more satisfying, 3GPP was formulating the LTE Femtocell technology. This technology is used for indoor environment was known as Home Evolved Node B (HeNB). This technology was aim to increase a system capacity as well as it performance. It also put a focus to successfully achieve the high data rate.

The interferences and challenges in the technology cannot be avoided. Similarly to other technologies, same goes to LTE Femtocell technology. One of challenges is to discover the best technique to boost the indoor signal coverage as well as to keep high data rate services since there are such a lot of technique that introduces to improves the signal coverage and to enhance the system capacity.