



ANALYSIS OF HANDOVER PERFORMANCE
IN MOBILE WIMAX NETWORK

NURULHUDA BINTI ABD MANAN

MASTER OF SCIENCE IN
TELECOMMUNICATION AND INFORMATION
ENGINEERING

JULY 2013

UNIVERSITI TEKNOLOGI MARA

**ANALYSIS OF HANDOVER PERFORMANCE IN A
MOBILE WiMAX NETWORK**

NURULHUDA BINTI ABD MANAN

Dissertation submitted in partial fulfillment of the requirements for the
degree of
Master of Science in Telecommunication and Information Engineering

Faculty of Electrical Engineering

JULY 2013

ABTRACT

Mobile WiMAX is a fast growing broadband access technology that enables low-cost mobile Internet application. Data, voice and video streaming are the main application of the mobile WiMAX and the demand from the user is growing every day. The handover performance in mobile network is the most important factor that can influence the Quality of Service (QoS). The parameters such as throughput and packet delay are the main factors which affect the WiMAX network performance. This paper study the handover performance in term of handover delay, throughput and packet delay for three different traffic applications which are Voice over IP (VoIP), video conferencing and web browsing (HTTP). A different traffic give different handover delay time, throughput and packet delay during handover process.

ACKNOWLEDGEMENTS

With the name of Allah the most beneficent the most merciful. I am Nurulhuda Binti Abd Manan want to wish a great appreciation to my supervisor, Dr Darmawaty Binti Mohd Ali that always help me by giving any information and guidance during the process of completing this final project. I would like to give thanks to my parents, family, and my friends for their cooperation towards me and support me. Thank you again for all your cooperation.

TABLE OF CONTENT

Abstract	iii
Acknowledgement	iv
Table of Contents	v
List of Figures	vi
List of Table	vii
Abbreviations	viii
1.0 INTRODUCTION	
1.1 Introduction	1
1.2 Objective	6
1.3 Scope of work	6
2.0 LITERATURE REIVEW	
2.1 Handover in Mobile WiMAX	7
3.0 MOBILITY IN MOBILE WiMAX	
3.1 Mobile WiMAX Reference Architecture	11
3.2 Mobile WiMAX Physical (PHY) Layer	13
3.2.1 Orthogonal Frequency Division Multiple Access Basics	14
3.2.2 Time Division Duplex Frame Structure	17
3.3 Mobile WiMAX Medium Access Control (MAC) Layer	20
3.4 Quality of Services (QoS) and Scheduling	24
3.5 Mobility in Mobile WiMAX	30
3.6 Handovers	32
3.6.1 Types of Handover	32
3.7 Handover Process	37
3.7.1 Handover Method Comparison	45
4 SIMULATION	
4.1 Parameter setup	48
4.2 Simulation Result	49
5 CONCLUSION	58
REFERENCES	59