PERFORMANCE ANALYSIS OF HANDOVER IN MOBILE WiMAX SYSTEM

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ABSTRACT

Abstract—Mobile WiMAX/IEEE 802.16e standard is designed to support for both stationary and mobile transmission. With excess to supports high data rate and covering large areas it becomes the demands for consumers. Mobile WiMAX systems must have an efficient handover scheme in order to provide a good service for mobile subscriber. On the other hand to succeed an efficient handover the process must in minimum amount of packet loss. The probability of this packet loss might lead link handover start delay and degrade the data transferred from one BS to another BS. In this this paper the performance of handover in term of delay and throughput has been analyzed using the streaming video application with speed of pedestrian. OPNET Modeler 14.5 software was used as a tool for simulation.

Index Terms—Mobile WiMAX, IEEE 802.16e, handover delay, throughput

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

As the demand for multimedia application such as video streaming, Internet TV, music downloads, video conferencing, VoIP and social networking have shown an increasing trend, the expectation of anytime and anywhere has led to the next generation network (NGN) services. Mobile WiMAX is one of such NGN system that can provide large range of services and applications [1].

Mobile WiMAX allows user to move freely during data transmission. The main consideration of mobile WiMAX is that there should be no data loss when the moving user switches from one base station (BS) to another that is during handover [2].The handover process involves transferring the context of all service flows together with other context from the previous BS to the new BS, while attempting to ensure minimal delay and data loss during this transition. During the handover process, the mobile station may suffer packet loss. The probability of this packet loss is directly related to link handover start delay and the IP subnet configuration completion time.

The IEEE 802.16e specifies handovers for portability, simple mobility and full mobility of the users. Portability and simple mobility fall into a hard handover group. The moving speed is in the range of walking speed and low vehicular speed for portability and simple mobility respectively. Handover among BS provide service continuity for all real-time and non real-time applications. Full mobility comes under the group of a soft handover. Maximal supported speed matches high vehicular speed (about 160 km/h) [3]. The handover should be fast enough so that the ongoing applications are not interrupted, at least for so long that the user notices it.