PERFORMANCE EVALUATION OF MANHATTAN MODEL FOR HANDOFF IN MOBILE WIRELESS NETWORKS

This thesis is presented in partial fulfillment for the award of the Bachelor of Engineering (Honors) in Electrical

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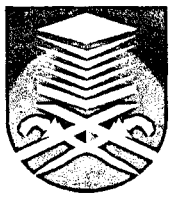

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ABSTRACT

In the future cellular mobile systems, the steadily growing mobile subscriber community and their demand for diversity of service place great challenge on the bandwidth utilization, especially in the wireless network part, as radio spectrum is a limited resource. This project analyzes the performance evaluation of Manhattan model for handoff in mobile wireless network. The Manhattan model represents a typical city environment that is characterized by alignment of building blocks with streets cutting apart neighboring blocks. This model enables us to evaluate the performance criteria such as call blocking and handover probabilities due to the effect of averaging and hysteresis on the handoff process. Handoff is one of the most critical features of a network because it is directly related to the system capacity and performance of a cellular network system. Next generation high-speed cellular networks are expected to support multimedia applications which require quality of service (QOS) provisions. Dynamic Channel Assignment (DCA) scheme have been proposed with subset of total available channel reserved for use handovers shows significantly better result in term of lost call during handover. Detailed simulations model using MATLAB software is carried out to evaluate the performance of such systems for the proposed methodology compared to other channel allocation technique.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The cellular concept was a major breakthrough in solving the problem of spectral congestion and user capacity. It offered very high capacity in a limited spectrum allocation without any major technological changes. The cellular concept is a system-level idea which calls for replacing a single, high power transmitter (large cell) with many low power transmitters (small cells), each providing coverage to only a small portion of the service area. Each base station is allocated a portion of the total number of channels available to the entire system, and nearby base stations is assigned different groups of channels so that all the available channels are assigned to a relatively small number of neighboring base stations.

Neighboring base stations are assigned different groups of channels so that the interference between base stations (and the mobile users under their control) is minimized. By systematically spacing base stations and their channel group through a market, the available channels are distributed throughout the geographic region and may be reused as many times as necessary so long as the interference between co-channel stations is kept below an acceptable level.

As the demand for service increases (as more channels are needed within a particular market), the number of base stations may be increased (along with a corresponding decrease in transmitter power to avoid added interference), thereby providing additional radio capacity with no additional increase in radio spectrum.

In cellular mobile communications, coverage area is divided into smaller regions called cells to allow the reuse of the frequency spectrum to increase the network capacity. Each cell is controlled by its own transmitter and receiver of the base