WIRELESS AD HOC NETWORK USING HANDHELD DEVICES

Project report is presented in partial fulfilment for the award of the

Bachelor of Electrical Engineering (Hons)

UNIVERSITI TEKNOLOGI MARA

SITI ASMAH BT MAHAT

FACULTY OF ELECTRICAL ENGINEERING

UNIVERSITI TEKNOLOGI MARA

40450 SHAH ALAM, SELANGOR, MALAYSIA

MAY 2006

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

ABSTRACT

This report describes the development and implementation of a wireless ad hoc network for mobile handheld devices. As users are increasingly mobile it is more and more common for users to meet and communicate without prior planning and in environments where there is little or no networking infrastructure. Such a network is known as an ad hoc network, where the network is of a dynamic nature without centralized administration. Current technology such as IEEE 802.11b wireless LAN can form ad hoc networks but is limited in that only single hop networks can be formed. This means that each node can only act as a host, whereas in a multi-hop ad hoc network all nodes act as routers. This project concentrated on the setting up a wireless ad hoc network testbed consists of one Personal Digital Assistant (PDA) and one wireless notebook. The implementation enabled the notebook and the Personal Digital Assistant (PDA) to form a multi-hop ad hoc network with 802.11b wireless cards.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Mobile computing has been making its way to the forefront. The impact of mobile computing in our lives is very significant where mobile computing can create an opportunity to be connected with each other, provide fast and easy Internet or intranet broadband access. Hence, the need for a pervasive computing is now getting popular than ever. Pervasive computing is computing in an environment where users will be able to access information without going out of their way. To achieve this, users must be surrounded by the technologies without they knowing them so. Pervasive computing is a trend that is currently driving and will continue to drive many technologies of tomorrow. These revolutionary technological advances in mobile computing and wireless technologies, such as wireless LANs promote the rapid usage of wireless communication between mobile users. These technological advancements are pushing manufacturers of these wireless products into races of providing lower price equipment and higher data rates. This phenomenon becomes a reason for the rapid growth in mobile computing. As users are increasingly mobile, it is common for users to meet and communicate without prior planning. For example, business meetings always require documents to be exchanged and it could happen in a café or at the airport. In such situation, it is difficult and inconvenient to set up a wired local area network (LAN) quickly. Therefore, network known as an ad hoc network is the solution. The network is of a dynamic nature without centralized administration. In simpler terms, ad hoc networks operate without access points (APs). The lack of an AP means that the computers can connect to one another, but they cannot work in conjunction with a wired network. As a result, they have significantly less capability as a network, but they can still be quite useful [1]. Current technology support ad hoc networks but is