SECURITY MECHANISM FOR WIRELESS MOBILE AD HOC NETWORK (MANET)

This project report is presented in partial fulfillment for the award of the Bachelor of Electrical Engineering (Hons)

UNIVERSITI TEKNOLOGI MARA

DIANA BINTI ABDUL RAHMAN SIDEK

FACULTY OF ELECTRICAL ENGINEERING

UNIVERSITI TEKNOLOGI MARA

40450 SHAH ALAM

ACKNOWLEDGEMENT

In the name of Allah S.W.T

Most Gracious Most Merciful

First and foremost I would like to express my special thanks to my Industrial Project supervisor, Associate Professor Dr. Mohd Dani Bin Baba for all her knowledge, enthusiasm, guidance, and precious advice in completing this final project. Excellent would not be possible without his effort and bright leadership.

I am also would like to thank my parents, Abdul Rahman Sidek and for their undivided love, encouragement, and understanding to the completion of this thesis. And a very loving "thank you" goes to my fiancée for his support, invaluable help, and tolerating throughout this one-year duration of this thesis.

Finally, thanks to all my lovely friends, and lectures who are involved in the completion of this thesis for their moral support, guidance, and encouragement.

Diana Binti Abdul Rahman Sidek
Faculty of Electrical Engineering
Universiti Teknologi MARA
Shah Alam

November 2006

ABSTRACT

This report describes the security mechanism of secret key cryptography for wireless ad hoc network. This project uses LabVIEW (version 6.0) a graphical programming software by National Instrument. The security mechanism consists of encryption and decryption method as being implemented using LabVIEW software. The wireless ad hoc network comprises of wireless mobile nodes that can freely and dynamically self-organize into arbitrary and temporary network topologies. It advantages is include the speed of connection setup, and ease of removal of services or users. Today, the military tactical operations are still the main application of ad hoc networks. This report provides an overview of wireless ad hoc networks, wireless threats, cryptography background and the security algorithms for this encryption method. The One Time Pad algorithm and Caesar Cipher algorithms are implemented using LabVIEW software. These algorithms are chosen because they are suitable for low bit rate data. The purpose of this project is to implement secure mechanism for data transfer in wireless ad hoc network.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND STUDY

Nowadays, security is the technique for ensuring the data stored in a computer cannot be read without authorization. Ad hoc networks are new paradigm of wireless communication which can be highly vulnerable to security threats [1]. Wireless ad hoc network can be used to view, review, manipulate, use and transmit data at anywhere. From the literature review, many studies close on security threats and how to avoid computer security breach in mobile ad hoc network (MANET). MANET generates large interest because of their flexibility and easy to set up[1]. Ad hoc networks play a key role in the evolution of wireless communication. Security is the most important feature in all computerized system.

1.2 OBJECTIVES OF THE STUDY

The main goal of the project is to develop security mechanism based on LabVIEW (version 6.0) for wireless mobile ad hoc network (MANET). The objectives of the project are as below:

1. To develop the security mechanism for wireless ad hoc network
2. To implement the security algorithms with LabVIEW software
3. To evaluate the performance of security mechanism for wireless ad hoc network

1.3 SCOPE OF WORKS

In order to accomplish the objectives of the thesis, there are 8 steps involve in the implementation of this project as mention below: