A SIMULATION STUDY OF ROUTING PROTOCOL PERFORMANCE FOR MOBILE AD HOC NETWORKS

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ABSTRACT

In this paper, the simulation of routing protocol performance for mobile ad hoc network is presented. The performance analysis is derived by comparing two routing protocols; AODV and LAR. Mobile ad hoc networks (MANETs) are autonomous systems of multi-hop, wireless mobile nodes that do not require base stations or any fixed infrastructure. MANET is required at the field or location which no base station or any fixed infrastructure available such as during nature disaster or war. Ad hoc networks are very attractive for tactical communication in the military and law enforcement. They are also expected to play an important role in civilian life such as convention centers, conferences, electronic classrooms and disaster recovery. Nodes in this network model share the same random access wireless channel. The simulation is done by using Qualnet Simulator.

Keywords: Routing protocol performance, mobile ad hoc network, AODV, LAR

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CHAPTER 1

INTRODUCTION

This chapter gives an overview of the complete definition of all related subjects and material used in this thesis. The rest of this thesis will be structured as follows:

- *Chapter 2* introduces an overview to Ad Hoc On Demand Distance Vector routing protocol, basic operation of AODV routing protocol and how it works and also benefits and disadvantages using AODV routing protocol.
- *Chapter 3* introduces an overview to Location-Aided Routing protocol, basic operation of LAR routing protocol and how it works and also benefits and disadvantages using LAR routing protocol.
- *Chapter 4* presents the comparison between AODV and LAR.
- *Chapter 5* describes the methodology of experiments using Qualnet to analyze the both AODV and LAR routing protocol performances.
- *Chapter 6* produces the result and findings from the simulation performed and its discussion.
- *Chapter 7* concludes the thesis and presents possible future work.

1.1 Wireless Networks

Wireless networks use radio waves to transfer data without using wires. Radio waves are created when electrically charged particles accelerate with a frequency that lies in the radio frequency portion of the electromagnetic spectrum. In 1970, Norm Branson et al. developed a radio-based communication system know as ALOHANET [17]. This was the first wireless packet switch network and was the result of an experiment of a group of researchers in Hawaii trying to find the most effective means to share data between four university sites on 4 separate Islands. Since then wireless technologies have evolved and can be seen in many different forms today. Some of these include [18][19],

- Wi-Fi used generically when referring to any 802.11 network, 802.11a, 802.11b or 802.11g. Operating in both the 2.4 and 5 GHz band with a theoretical data transmission rate of 54Mb/s.