ENHANCING TCP PERFORMANCE IN MOBILE AD HOC NETWORK USING EXPLICIT LINK FAILURE NOTIFICATION (ELFN)

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A project submitted to Dean of Awang Had Salleh Graduate School in Partial Fulfilment of the requirement for the degree Master of Science of Information Technology University Utara Malaysia

By
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ABSTRACT

The dynamics and the unpredictable behaviour of a wireless mobile ad hoc network results in the hindrance of providing adequate reliability to network connections. Frequent route changes in the network relatively introduce incessant link failures which eventually degrade TCP performance considerably. In this research, we are going to study the potential improvement of TCP performance when Explicit Link Failure Notification is implemented as opposed to the standard TCP mechanism. ELFN modifies the 'slow start' mechanism that is used in standard TCP so that the throughput achieved from the network can be maximized.

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LIST OF ABBREVIATION

ACK	Acknowledgement
AODV	Adhoc On-demand Distance Vector
BDP	Bandwidth-Delay Product
BIC	Binary Increase Congestion
BS	Base Station
cwnd	Congestion Window
DSR	Dynamic Source Routing
ECN	Explicit Congestion Notification
ELFN	Explicit Link Failure Notification
GPPL	General Purpose Programming Languages
GUI	Graphical User Interface
IP	Internet Protocol
IPSEC	Internet Protocol Security
IPv6	Internet Protocol Version 6
LL	Link Layer
MAC	Media Access Control
MANET	Mobile Ad Hoc Network

M-TCP	Mobile TCP
NRL	Normalized Routing Load
NS	Network Simulator
PSL	Plain Simulation Language
RREP	Route Reply
RREQ	Route Request
RTT	Round Trip Time
rwnd	Receiver Window
SACK	Selective Acknowledgment
SP	Simulation Packages
TCL	Tool Command Language
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
VoIP	Voice over Internet Protocol

CHAPTER ONE

INTRODUCTION

Mobile ad hoc network has gained a lot of attention in recent years due to its dynamic characteristics and its self-governing behaviour which does not require a fixed infrastructure (Abduljalil et al., 2006). Numerous ongoing research are focusing on routing protocols for example (Mittal, 2009), (Runcai et al, 2009), (Maan et al., 2011) and (Qian et al., 2009). In this project, we are focusing towards the performance of TCP in mobile ad hoc networks.

It is unavoidable to use TCP in mobile ad hoc network taking into account the applications and services it can provide to the network users. Hence, this project is meant to bring forward a specific issue related to TCP congestion control mechanism which is modified so that it would give a better performance in mobile ad hoc network.

1.1. Introduction

The popularity of wireless network has been growing steadily. Wireless ad hoc networks have been popular because they are very easy to implement without using base stations. The wireless ad hoc networks are complex distributed systems that consist of wireless mobile or static nodes that can freely and dynamically self-organize (Jain, et at., 2002). The ad hoc networks allow nodes to seamlessly communicate in an area with no pre-existing infrastructure. Future advanced technology of ad hoc network will allow the forming of small ad hoc networks on campuses, during conferences and even in homes. Furthermore, there is an increasing need for easily portable ad hoc networks in rescue

The contents of the thesis is for internal user only

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