SNR BASED DSDV ROUTING PROTOCOL FOR MANET

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SNR BASED DSDV ROUTING PROTOCOL FOR MANET

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ABSTRAK

Rangkaian *'ad hoc'* mudah alih (MANET) adalah susunan dinamik bagi nod tanpa wayar bagi menghasilkan rangkaian sementara tanpa nod pentadbiran utama. Nod tanpa wayar atau dikenali sebagai platform mudah alih dapat bergerak bebas secara rawak di dalam rangkaian liputannya. MANET merupakan sistem berautonomi yang dapat beroperasi secara berasingan (rangkaian tempatan sahaja) atau boleh mempunyai pintu masuk kepada antaramuka rangkaian tetap. Salah satu bahagian utama MANET adalah protokol laluannya pada lapisan rangkaian. Protokol tersebut perlu menentukan laluan mana yang perlu dilalui oleh paket bagi memastikan penghantaran paket dari penghantar ke penerima. Algoritma yang mengira laluan tersebut dikenali sebagai algoritma laluan (Kurose, 2009). Oleh kerana sifat yang tidak menentu medium tanpa wayar dalam persekitaran MANET, protokol laluan yang berasaskan bilangan lompatan akan merosot prestasinya disebabkan oleh hingar yang diterima oleh nod penerima (Douglas, 2003). Bagi projek ini, protokol laluan berasaskan nisbah isyarat kepada hingar (SNR) akan diterapkan dalam protokol laluan *'destination sequenced distance vector'* (DSDV) dengan membangunkan algoritma yang dapat mengira hasil jumlah purata SNR dari penghantar ke penerima dan seterusnya memasukkan algoritma tersebut dalam protokol laluan DSDV. Hasilnya adalah protocol laluan *'SNR based DSDV'* dan keluarannya akan dibandingan dengan '*standard DSDV'* bagi metrik prestasi yang terdiri daripada 'throughput', lengah hujung ke hujung dan nisbah penghantaran paket melawan kadar penghantaran dan bilangan nod.

ABSTRACT

A wireless mobile ad-hoc (MANET) network is a dynamic formation of wireless nodes to perform a temporary network without center administration node. The wireless node which is also known as mobile platform are free to move randomly within its network coverage. The MANET is an autonomous system which operates in isolation (local area network only) or may have gateways to an interface with a fixed network. One of the main parts of MANET is its routing protocol in network layer. The protocol has to decide which path that needs to be taken by packets to ensure the packet transfer from sender to receiver. The algorithms that calculate these paths are referred as routing algorithms (Kurose, 2009) Due to unpredictable behavior of the wireless medium in MANETs environment, the standard routing protocol based on hop count suffers due to the noise that collected at receiving nodes (Douglas, 2003). In this project the Signal-to-Noise (SNR) based routing protocol has been adapted into the standard Destination Sequenced Distance Vector (DSDV) routing algorithm by developing an algorithm to calculate the cumulative average SNR from source to destination and apply the algorithm in the DSDV routing protocol. The expected result is SNR based DSDV routing protocol and the outcome would be comparisons of performance metrics between standard DSDV for the throughput, end-to-end delay and packet delivery ratio versus transmission rate and node numbers.

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Mohd Fairuz Bin Muhamad Fadzil

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LIST OF ABREVIATIONS

Glossary

MANET	Mobile Ad Hoc Network
DSDV	Destination – Sequenced Distance Vector
NPDU	Network Protocol Data Unit
SNR	Signal to Noise Ratio
AWGN	Additive White Gaussian Noise
RTT	Round Trip Time
ETX	Expected Transmission Count
AODV	Ad Hoc On Demand Distance Vector
OLSR	Optimize Link State Routing
DSR	Dynamic Source Routing
ACK	Acknowledge
MAC	Medium Access Control
MGMT	Management
FT	Forwarding Table
Dst	Destination address

Nxt	Node (next hop)
Mtr	Cost (SNR) of the destination
Seq	Sequence number for each entry
Ist	Installation or update time for each entry
Flg	Transmission on the next broadcast indicator
NED	NEtwork Description
GUI	Graphical User Interface
UDP	User Datagram Protocol
TCP	Transmission Control Protocol
SCTP	Stream Control Transmission Protocol
IP	Internet Protocol
IPv6	Internet Protocol version 6
PPP	Point to Point Protocol
MPLS	Multiprotocol Label Switching
OSPF	Open Shortest Path First
NIC	Network Interface Card
BPS	Bits per Second

Fsnr	Fairuz Signal to Noise Ratio
Pdr	Packet Delivery ratio
dB	Decibel
Tx	Transmission
Vs	Versus

CHAPTER 1

INTRODUCTION

1.1 Introduction

Wireless ad hoc networks have a lot of attraction recently by researchers. It is all about low cost and wireless communication support through multihop without depending on fixed infrastructure such as wireless access point. There are different terms for MANET with respect to their usage such as mobile ad hoc network (MANET), wireless mesh network (WMN) and wireless sensor network (WSN). To make sure end-to-end communication goes well, routing algorithm has an important role to trace the best path and forward the packet from source until reach the destination. There is a big challenge to find a good path in wireless ad hoc network compared with fixed wired network because wireless links are different from wired links. Zhai and Fang describe routing issues in wireless ad hoc network. The first one is channel errors caused wireless link are not reliable. Second, at each different link, they have their own channel rate due to link quality which is depends on distance and path loss within two neighboring nodes. Third, link breakdown when neighbor out of coverage range. Fourth, there will be interference from one link to another since the transmission method is in broadcast mode (Zhai, 2006).

The contents of the thesis is for internal user only

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