ANALYSIS OF DIFFERENT ROUTING PROTOCOLS IN IPv4 AND IPv6 USING NETWORK SIMULATOR

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ANALYSIS OF DIFFERENT ROUTING PROTOCOLS IN IPv4 AND IPv6 USING NETWORK SIMULATOR

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DEDICATION

Dear Allah

I devoted my life for Allah and May my life is within Your guidance.

Dear my parents

Thank you for your sacrifice and love. No such compensate except from Allah.

Dear Teacher

Thank you for all the knowledge. May your knowledge are beneficial and useful for all humanity.

This work is dedicated to my beloved family and siblings, who passed on a love of reading and respect for education.

To my supportive friends and my supervisor, thank you so much for assist and help.

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ABSTRACT

In the current era, information technology is now considered essential to daily living person. The development of Internet capabilities and Web development world is huge. In connection with it, we find the field of networking is very important at present because without the internet network, people cannot communicate freely with each other despite being in a different region or the world. Field network can be considered a very important part of life, and this area also has many advantages such as saving and easy person to deal with someone over the Internet and does not need to waste energy and money to find out. This proposed project is to analyze the differences in using different routing protocols with the Internet Protocol version 4 and Internet Protocol version 6. Among the analyzed routing protocol is Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP) and Open Shortest Path First (OSPF).From analysis of the final results of this project, the project will produce results which are most appropriate routing and Internet Protocol version which is great for use again.

ABSTRAK

Pada zaman era sekarang, dunia teknologi maklumat kini di anggap sangat penting untuk kehidupan seharian seseorang itu. Perkembangan keupayaan internet dan pembangunan dunia web sangat meluas. Sehubungan dengan itu. kita dapati bidang rangkaian adalah amat penting pada masa kini kerana tanpa rangkaian internet, manusia tidak dapat berhubung antara satu sama lain dengan bebas walaupun berada di kawasan atau dunia yang berbeza. Bidang rangkaian ini boleh di anggap sebahagian yang amat penting dalam kehidupan dan bidang ini juga mempunyai banyak kelebihan diantaranya menjimatkan dan memudahkan seseorang itu berurusan dengan seseorang melalui internet dan tidak perlu untuk membazirkan tenaga dan wang untuk keluar berjumpa. Projek ini dicadangkan adalah untuk menganalisa perbezaan routing protocol dengan menggunakan perbezaan Internet Protocol version 4 dan Internet Protocol version 6. Diantara routing protocol yang dianalisis adalah Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP) dan Open Shortest Path First (OSPF). Daripada analisa keputusan akhir projek ini, projek ini akan mengeluarkan keputusan routing manakah yang paling sesuai dan version Internet Protocol yang mana lagi bagus untuk digunakan.

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LISTS OF ABBREVATIONS

IPv4	-	Internet Protocol Version 4
IPv6	-	Internet Protocol Version 6
RIP	-	Routing Information Protocol
IGRP	-	Interior Gateway Routing Protocol
OSPF	-	Open Shortest Path First
BGP	-	Border Gateway Protocol
IS-IS	-	Intermediate System To Intermediate System
EIGRP	-	Enhanced Interior Gateway Routing Protocol
IP	-	Internet Protocol
OPNET	-	Optimum Network Performance
IGP	-	Interior Gateway Protocol
EGP	-	Exterior gateway protocol
ARPANET	-	Advanced Research Projects Agency Network
AS	-	Autonomous Systems
XNS	-	Xerox Network Systems
VLSM	-	Variable Length Subnet Masking
CIDR	-	Classless Inter-Domain Routing
LSDB	-	Link-State Database
SPF	-	Shortest Path First
LAN	-	Local Area Network
PDF	-	Packet Delivery Fraction
AMRoute	-	Adhoc Multicast Routing
ODMRP	-	On-Demand Multicast Routing Protocol

AMRIS	-	Adhoc Multicast Routing protocol utilizing Increasing id-numberS
CAMP	-	Core-Assisted Mesh Protocol
GloMoSim	-	Global Mobile Information System Simulator
PARSEC	-	Parallel Simulation Language
PSM I	-	Projek Sarjana Muda I
PSM II	-	Projek Sarjana Muda II
GUI	-	Graphical User Interface

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CHAPTER 1

INTRODUCTION

1.1 Project Background

Routing protocol is a protocol used by a router to determine the appropriate path over which data is transmitted. Routing protocol also specifies how routers in a network share information with each other and report changes. They are many popular routing protocol use today including Routing Information Protocol version 1(RIPv1), Routing Information Protocol version 2(RIPv2), Interior Gateway Routing Protocol (IGRP), Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF), Intermediate System to Intermediate System (IS-IS) and Border Gateway Protocol (BGP). Since Internet Protocols version 6 (IPv6) introduced it is important to understand the impact of networks performance between Internet Protocols version 4 (IPv4) and IPv6 routing protocols. Therefore this project is to analysis of different routing protocols in IPv4 and IPn6 using network simulator.

Operating system namely Window 7 is use in the project. This operating system use because it can support network simulator namely Optimum Network Performance (OPNET). The network topology of this project consists of 1 pc connected directly to a server through 5 routers. The analysis of this project will focus on the throughput, packet delay, and utilization. The comparisons between the throughput, packet delay, and utilization will conduct in IPv4 and IPv6 routing protocol namely RIP, IGRP and OSPF

by using network simulators. Then a module is been created to show which routing protocol is the best to use in specific network. Through this project, user can see the comparison of each routing protocol that been use between RIP, IGRP and OSPF.

In the end of the analysis some module been created to show and prove which protocol is the best. The comparison is base on the throughput, packet delay and utilization that will conclude to complete this project. The module will be useful for future use because users will understand and can make a perfect choice to make a routing. This module is the main target and will make this analysis perfectly done, and all the analysis that been carried out has reached the objective and make this project to be a successful thesis.

1.2 Problem statement(s)

1) **Few works are found to study about routing protocol performance in IPv4 and IPv6 by using Optimum Network Performance (OPNET)**

   Only few study about routing protocol performance in IPv4 and IPv6 using network simulator a found. They are no references to identify and solve problems occur while doing an analysis. Appropriate method based on several researches about routing protocol will helpful in this project.

2) **To lack of knowledge of routing protocol between IPv4 and IPv6.**

   This project fully develops by using OPNET. Not many people expert using this OPNET because it is use to analysis network environment only. To complete this project requires extensive knowledge to use a routing between IPv4 and IPv6.