PERFORMANCE ANALYSIS OF MOBILE IPv4 AND MOBILE IPv6 IN IEEE 802.11n ENVIRONMENT

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This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Computer Networking)

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2011

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I hereby declare that this project report entitled

PERFORMANCE ANALYSIS OF MOBILE IPv4 AND MOBILE IPv6 IN IEEE 802.11n ENVIRONMENT

Is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ DATE: 6.7.2011

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SUPERVISOR: _____ DATE: 6.7.2011

(MR.MOHD NAJWAN BIN MD KHAMBARI)

DEDICATION

To my parents, thank you for your sacrifice and love. No such compensate except Allah.

To my others family, your support and encouragement give me strength to finish this study. I hope that the cooperation be remembered forever.

To teachers, thank you for all the knowledge. May your knowledge are beneficial and useful for all humanity. I hope that the cooperation be remembered forever.

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ABSTRACT

This project conducts an examination of the performance of Mobile Internet Protocol version 4 (MIPv4) and Mobile Internet Protocol version 6(MIPv6) over IPv4 and IPv6 in IEEE 802.11n environment. The number of mobile computers is increasing today, and efficient support for mobility will make a decisive difference to the Internet's future performance. This along with the growing importance of the Internet and the web indicates the need to pay attention to supporting mobility. Mobile Internet Protocol version 6 is a protocol to deal with mobility for the next generation Internet (IPv6). However the performance of MIPv6 especially in comparison with MIPv4 has not been extensively investigated. In this document an analysis of the MIPv6 performance in term of throughput, packet loss and jitter is presented. This document also introduces the comparisons between MIPv4 and MIPv6 to support mobility.

ABSTRAK

Projek ini akan dilakukan dengan menilai prestasi *Mobile Internet Protocol version 4*(MIPv4) dan *Mobile Internet Protocol version 6* (MIPv6) dengan menggunakan *Internet Protocol version 4* (IPv4) dan *Internet Protocol version 6* (IPv6). Jumlah komputer mobile meningkat hari in dan boleh menyebabkan tahap sokongan terhadap mobiliti masa hadapan perlu ditingkatkan. Hal ini seiring dengan semakin pentingya internet dan laman web pada zaman sekarang serta menunjukkan perlu ada pemerhatian terhadap sokong mobiliti. MIPv6 adalah protocol yang berurusan dengan mobiliti untuk generasi internet berikutnya iaitu IPv6. Walaubagaimanapun belum ada perbandingan prestasi MIPv4 dan MIPv6 dengan teliti. Dokument ini akan membentangkan analisis prestasi MIPv4 dan MIPv6 dalam perubahan *throughput, packet loss* dan *jitter* dalam menyokong mobiliti. Dalam dokumen ini juga memperkenalkan perbandingan antara MIPv4 dan MIPv6 dalam menyokong mobilti.

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IPv6	-	Internet Protocol Version 6
IPv4	-	Internet Protocol Version 4
MIPv4		Mobile Internet Protocol Version 4
MIPv6		Mobile Internet Protocol Version 6
IP		Internet Protocol
UDP		User Datagram Protocol
TCP		Transmission Control Protocol
OSI		Open System Interconnection
HA		Home Agent
RTT		Round Trip Time
MN		Mobile Node
AR		Access Router
DHCP		Dynamic Host Configuration Protocol
Mbps		megabytes per second
m/s		meter per second
ms		millisecond

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CHAPTER I

INTRODUCTION

1.1 Project Background

The project background is related to how Internet Protocol Version 6 (IPv6) can improve the performance as the jitter, throughput and packet loss changes due to supporting mobility. Mobile Internet Protocol Version 4 (MIPv4) is a popular mobility protocol used in the current Internet Protocol Version 4 (IPv4) network. With the next generation Internet IPv6 emerging, the Mobile Internet Protocol Version 6 (MIPv6) protocol is designed to deal with mobility and to overcome some problems suffered by MIPv4. Although MIPv6 shares many features with MIPv4, there exits some differences. The difference in overall jitter, throughput and packet loss of MIPv4 compared to MIPv6 is roughly proportional to the difference in packet size attributed to IPv6's increased header size. During the project is running, need to know comparison between Mobile IPv4 and Mobile IPv6 in supporting mobility.

1.2 Problem statements

- Lack of study of IPv4 and IPv6 mobile devices.
  - The new internet protocol in network communication that is IPv6 and how the performance is very good than IPv4. Needs to know good performance between IPv6 and IPv4 mobile devices.

- The performance MIPv4 and MIPv6 between indoor and outdoor.
  - Find out the better MIPv4 and MIPv6 in indoor and outdoor based on jitter, throughput and packet loss.

- Advantages and disadvantage of MIPv6.
  - Do not know what the advantages and disadvantages of mobile IPv6 devices.

1.3 Objective

The main objective of my project:

- To analysis performance in MIPv4 and MIPv6.
  - The objective project is analysis about jitter, throughput and packet loss between MIPv4 and MIPv6 performance. Ensure the good performance between MIPv4 and MIPv6 to support mobility.

- To check the performance between two distances.
  - In this objective, these projects will analysis MIPv4 and MIPv6 to maintain connection between server and client when they test in indoor and outdoor based on jitter, throughput and packet loss. In addition, ensure the time taken by a packet to reach from one network to the other using different mobile Internet Protocol (IP).

- To identify advantage and disadvantage of MIPv6 in environment mobile devices.

1.4 Scope

- In this project will focus on performance between Mobile IPv4 and Mobile IPv6 using some parameters such as jitter, throughput and packet loss. This project will only cover the IEEE 802.11n wireless network and other wireless standard are not taken into consideration.

- Hardware requirement
  - Acer laptop (Windows 7 32 bit, 2G RAM)
  - D-Link DIR-615 Wireless Router.

- Software requirement
  - Windows 7 32 bit.
  - jperf-2.0.2 Traffic Generator.

1.5 Project significance

The network documentation about analysis of MIPv4 and MIPv6 performance in different parameter can give many advantages and some disadvantage to people used as references, especially in the field of communication and will help them know the effect to use Mobile IPv6 than Mobile IPv4 in the internet protocol communication. The result about analysis of Mobile IPv4 and Mobile IPv6 performance can include in this documentation. Besides that, the project will be analyzed base on real network and focus in three parameters such as

jitter, throughput and packet loss. By the parameters in this documentation, it can be easier to compare Mobile IPv4 and Mobile IPv6 and also to help people know which one is very good to used.

Lastly, the documentation can help people to improve much knowledge, information about Mobile IPv6 or Mobile IPv4 as references and also give users to be familiar with the IPv6 environments.

1.6 Expected Output

In this project, the expected output will be present in the diagram of graphs. The information in the graphs based on jitter, throughput and packet loss.

Besides that, in the real network usually have the network generator used to generate graphs. In the graphs will be display data transfer based on the jitter, throughput and packet loss.

1.7 Conclusion

The conclusion, this project will be analysis about performance Mobile IPv4 and Mobile IPv6. The analysis based on the three parameters such as jitter, throughput and packet loss. The information about the performance will be gathered and analyzed in the real network. Lastly, in the next chapter will be discussed about literature review. In the literature review explain about previous researches that related to this project and make comparison between researches. The fact and finding related to this project will be described in the next chapter.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

The chapter will be discussing about literature review. First part of this chapter focuses on facts and finding about the project. Fact and finding reviews approaches used in past researches, case studies, references or other finding that similar to this project. These sources provide idea about techniques can be used in this project. Project requirements will discuss about all necessary things needed to complete this project successfully. The project required software, hardware and other requirement to do this project. Lastly, in this chapter will be include project schedule and milestone to list out all the activities involved and estimated time taken to complete each activity. The project schedule and milestone is very important because it provides guidelines to follow in each phase of the project.