UNIVERSITI TEKNOLOGI MARA

IPv6 MODELING AND SIMULATION FOR UNIVERSITI UTARA MALAYSIA

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ABSTRACT

The transition from IPv4 network to IPv6 network is being processed vigorously. Extensive research is being done presently on this subject as transition from IPv4 to IPv6 requires a high level compatibility and clear procedure for easy and independent deployment of IPv6. The challenge ahead now is to push IPv6 deployment into the universities and end sites in the academic networks. The aim of this research is to develop IPv6 network model of Universiti Utara Malaysia (UUM) and simulate it behavior. We begin with translating the current IPv4 configuration into simulation environment. Then we implement IPv6 using dual stack transition mechanism on it. We also conduct the functionality test and performance evaluation on constructed model. The result shows that both IPv4 and IPv6 functionalities successfully work as expected and there were no negative impacts on our dual stack IP network behavior. It is also shows that the average delays of IPv6 are more stable compared to IPv4.

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CHAPTER 1

INTRODUCTION

Internet Protocol (IP) currently used in network and Internet addressing system is IP version 4 (IPv4). IPv4 will run out of IP addresses due to the exponential increment in network devices and mobile communication, along with global adoption of networking technologies. In view of this matter, the IETF (Internet Engineering Task Force) has been developing the next generation form of addressing known as Internet Protocol version 6 (IPv6) [1]. IPv6 provides very large address space (2^{128} addresses) and it also has other advantages such as faster routing, better Quality of Service, plug and play, and security improvement [2].

The global transition from IPv4 to IPv6 has been started. All leading countries in the field of Internet technology including US, Japan, China and India have started implementing IPv6 on their research and commercial networks. The implementation of IPv6 should be an important agenda in order to gain a significant position in the global ICT field and to reduce the technological gap between our nation and the leading countries [3].

In Malaysia, Ministry of Energy Water and Communication (MEWC) and Malaysian Administrative Modernization and Management Planning Unit (MAMPU) have already started their migration plans to implement IPv6 in their networks [4]. Base on the need for adopting the IPv6 in the network, Universiti Utara Malaysia