UNIVERSITI TEKNOLOGI MARA

ACTIVE ANYCAST SERVER SELECTION

NOOR SUHAINI MILA BINTI SUPARMAN

Thesis submitted in fulfilment of the requirements for the degree of Master of Science in Telecommunication and Information Engineering

Faculty of Electrical Engineering

May 2008

ABSTRACT

The proposed active anycast server selection is a network supported server selection method which can be used in replicated server environment. The replicated servers are scattered in the network and thus allow the distribution of access from clients geographically.

To permit communication between client and server, each route must have an active router to ensure that it is capable in forwarding the packets efficiently. An active router is responsible to select and make decisions on the appropriate server to handle request based on server selection used.

The work investigates three different active anycast server selection method; random, round robin and nearest server in terms of average server throughput and load balancing by means of simulation using J-Sim.

It was found that, round robin server selection is selected to be the best server selection method for equal server bandwidth since the request from client is distributed equally between the servers while the random server selection is selected to be the best server selection method for different server bandwidth since average throughput for server h7 is lower than h5 which reflects the initial setting of bandwidth of server h7 lower than h5.

ACKNOWLEDGEMENTS

It is hoped that this paper will provide useful and readable information on the performance evaluation area with regards to Active Anycast Server Selection. The author would like to thank Associate Professor Dr Habibah Hashim for her direction and advisorship in this Master project. The time she put forth and her patience were very much appreciated.

Special thanks go to the Meor Mohd Azreen Meor Hamzah for his time and input.

The author is especially grateful to her parents for their never-ending support and love, without which she could never have achieved her study and career goals.

Last but not least, the author wants to thank her husband, Nor Azrin, who has sacrificed so much to support her study, and his 15-month-old daughter, Nur Najla, who has proven that life is most enjoyable when looking at it through simplistic, innocent, and trusting eyes. Not to be forgotten, to those who directly and indirectly worked with me.

TABLE OF CONTENTS

CHAPTER 1

1.0 INTRODUCTION

In the world with a superior technology invented, it is hard to deny their valuable and constructive contribution in leading us to a better life. Communication for instance telephone, internet and telegraph have made us easy to correspond between locations in the worldwide regardless factors such as distance and time. In a situation of internet, client and server are normally used for communication between computers. There are several modes of network addressing; anycast, unicast and multicast addressing.

By a definition, anycast is well known as one to several connections whereby data is in retreat to the nearest endpoint as reviewed by the routing topology. In this case, each destination address will recognize a set of receiver endpoints, but there is a condition applied where information from a given sender will be received at one of the endpoint at any given time. Unicast addressing is known as connection of one-to-one between system address and system endpoint where each destination address exclusively or uniquely recognizes single receiver endpoints. Multicast is well known as one-to-many connection between system address and system endpoints where each destination address recognizes a set of receiver endpoints, meaning that all information is duplicated.

1.1 Active Anycast Server Selection

The notion of occupying more than a single server for a meticulous service is to enhance the availability and sources sharing by a large number of clients. The available quality of service in the network is a major parameter for the successful transmission of multimedia traffic. In general, the network should be designed to