

UNIVERSITI TEKNOLOGI MARA

**TRAFFIC BEHAVIOR OF LOCAL AREA NETWORK
(ETHERNET) BASED ON QUEUING MODELS AND
ITS QUALITY OF SERVICE**

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**Master Dissertation Submitted in Fulfillment
of the Requirements for the Degree of**

Master of Science (Computer Networking)

Faculty of Computer & Mathematical Science

March 2012

ACKNOWLEDGEMENT

First and foremost, the deepest gratitude of all shall be bestowed to Allah the Almighty and The Merciful for all the insight which He gave to us that lead to the completion of this study.

My deepest gratitude is extended to Assoc. Prof. Dr. Adnan Ahmad, for all assistance, advice, encouragement and invaluable support given as my project supervisor. Thank you for being such a great mentor.

My deepest gratitude is to Prof. Dr.Saadiah Yahya, for all advice, encouragement support given as my Lecturer, I really enjoyed in her class.

My deepest gratitude to my Lovely Mother, for her unending patience and support that helped me this project comes to an end. Without her pray, I would not have had the strength to complete this project. I also dedicate this work upon my late father ,My love to him will never end.

I am also indebted to my beloved Brothers and sister for always encouraging and supporting me with their heartwarming words, and for caring me in any situations. I am grateful to their incomparable love. I would also like to thank my beloved uncles and cousins who always afford their prayers for my continued success in life.

Not forgetting all the lecturers, friends and colleagues of Master Science (Computer Networking) and Faculty of Computer and Mathematical for their support and encouragement during the process of completing this research.

Finally, thank you to my family in Iran, for their phone calls, e-mails, and for bringing home to me in Malaysia: my brothers and sister.

ABSTRACT

Nowadays, Local area networks (LAN) are one of the most popular networks, and the LAN performance is very important for operators. The Local Area Network method has been applied as an essential infrastructure of numerous companies and organizations for a long time. Thus, this issue has create the network topological structure which continues to be elevated for that scientists and engineers to resolve, due to its foundational status within the network application. On the other hand, analyzing performance is consisted of examining counter values which are reported while the system is performing with various operations. Furthermore, there is some queuing model in this research which will focus on M/M/1 and M/M/c queuing model and also some parameters that can be used for analyzing LANs namely delay utilization and throughput that will be covered in this research.

Performance Analysis on LAN have been investigated by different researchers, but there is not any strict research about Performance Analysis of queuing model at LAN. Thus, there are some problems in analyzing performance of LAN at queuing model that will be solved in this research.

The purpose of this research is based on the objectives of this study which evaluates types of queuing model in LAN and compares the traffic behavior of these queuing models in terms of essential parameters. Moreover, to develop, design and implement a simulation model to perform the simulation of M/M/1 and M/M/c queuing model with different metrics and at last analyzing the results to evaluate traffic behavior of queuing model in LAN.

For conducting this research, the researcher has implemented some methods as following sequences:

Firstly, during the preliminary study and knowledge acquisition, a logical understanding is done as the background of study and problem justification which is continued on an empirical study which is done to verify the set of results in the system prototype, when all of data are gathered, M/M/1 and M/M/2 queuing model are implemented in LAN via OPNET simulator.

Finally, the system evaluation prepares a complete report of the research, and then it will be designed to performance analysis of these queuing models in LAN to evaluate number packet delay, utilization and throughput. After implementing the simulation according to achieved the result which shows that when the number of clients has been increased, delay and utilization will also be increased, because with increasing the clients, servers will be busier so the utilization will be increased. However, when the clients are increased the throughput will decrease. Also Moreover, when the researcher uses M/M/1 queuing system, the researcher have more delay rather than having M/M/2 and also have more utilization when use M/M/1. Nevertheless, when the researcher uses M/M/2 system, have a higher throughput compare to M/M/1.

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