

# **Performance Modelling of UUM Local Area Network (wired)**

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**Performance Modelling of UUM Local Area Network  
(wired)**

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in partial fulfillment of the requirement for the degree  
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**By**

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## **ABSTRACT**

Slow network connection in accessing resources is a common complaint on a computer network that has switches as dominant network equipment, when certain nodes are heavily loaded with clients more than their capacity. In this study a simulation model was developed and validated for the University of Utara Malaysia wired Local Area Network. The effect of network parameters such as the processing time and the packet arrival rate on the performance metrics such as throughput, end to end delay and utilization of the servers and switches on the network was investigated. The analysis of the results from the simulations carried out can assist the management of computer centre that manages the network in identifying the bottleneck node on the network and for future network capacity building.

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# TABLE OF CONTENT

<i>PERMISSION TO USE</i> .....	<i>I</i>
<i>ABSTRACT</i> .....	<i>II</i>
<i>ACKNOWLEDGEMENT</i> .....	<i>III</i>
<i>TABLE OF CONTENT</i> .....	<i>IV</i>
<i>LIST OF TABLES</i> .....	<i>VI</i>
<i>LIST OF FIGURES</i> .....	<i>VII</i>
<i>LIST OF ABBREVIATIONS FOR THE DISTRIBUTION SWITCHES</i> .....	<i>VII</i>
<b>CHAPTER ONE</b> .....	<b>1</b>
<i>INTRODUCTION</i> .....	<i>1</i>
<i>1.1 PROBLEM STATEMENT</i> .....	<i>2</i>
<i>1.2 OBJECTIVE</i> .....	<i>3</i>
<i>1.3 SCOPE OF STUDY</i> .....	<i>3</i>
<i>1.4 SIMULATION METHODOLOGY</i> .....	<i>3</i>
<i>1.5 SIGNIFICANCE OF STUDY</i> .....	<i>6</i>
<i>1.6 ORGANIZATION OF THE REPORT</i> .....	<i>6</i>
<b>CHAPTER TWO</b> .....	<b>8</b>
<i>LITERATURE REVIEW</i> .....	<i>8</i>
<i>2.1 INTRODUCTION</i> .....	<i>8</i>
<i>2.2 MODELLING TECHNIQUES OF COMPUTER NETWORK</i> .....	<i>8</i>
<i>2.2.1 ANALYTICAL MODELING</i> .....	<i>8</i>
<i>2.2.2 SIMULATION MODELLING</i> .....	<i>11</i>
<i>2.2.3 OPERATIONAL MODELING</i> .....	<i>13</i>
<i>2.3 LAN PERFORMANCE MODELING</i> .....	<i>16</i>
<i>2.4 SIMULATION TOOLS</i> .....	<i>19</i>
<i>2.5 SUMMARY</i> .....	<i>20</i>
<b>CHAPTER THREE</b> .....	<b>21</b>
<i>OMNET++, THE DISCRETE EVENT SIMULATION SYSTEM AND UUM LAN</i> .....	<i>21</i>
<i>3.1 INTRODUCTION</i> .....	<i>21</i>
<i>3.2 MODELLING IN OMNET++</i> .....	<i>21</i>
<i>3.2.1 OMNET MODULES CONNECTION</i> .....	<i>23</i>
<i>3.2.2 OMNET++ MODEL COMPONENTS</i> .....	<i>24</i>
<i>3.3 UUM LOCAL AREA NETWORK</i> .....	<i>24</i>
<i>3.3.1 THE LAN STRUCTURE</i> .....	<i>25</i>
<i>3.3.1.1 CORE SWITCHES</i> .....	<i>26</i>
<i>3.3.1.2 THE DISTRIBUTION SWITCHES</i> .....	<i>26</i>

3.3.1.3	EDGE SWITCHES.....	27
3.3.1.4	USERS NODE.....	27
3.3.1.5	CABLES.....	28
3.3.1.6	ROUTER.....	29
3.3.1.7	FIREWALL.....	29
3.3.1.8	SERVERS AT THE DATA CENTRE .....	29
3.3.2	OPERATION AND CONNECTIONS ON THE NETWORK.....	29
3.4	SUMMARY.....	30
<b>CHAPTER FOUR.....</b>		<b>31</b>
	MODEL DEVELOPMENT AND VALIDATION.....	31
4.1	INTRODUCTION.....	31
4.2	THE SIMULATION MODEL.....	31
4.3	MODEL VALIDATION.....	36
4.4	SUMMARY.....	37
<b>CHAPTER FIVE.....</b>		<b>38</b>
	SIMULATION RESULTS.....	38
5.1	INTRODUCTION.....	38
5.2	EXPERIMENTAL DESIGN.....	38
5.3	VARIATION IN THE PROCESS TIME.....	39
5.3.1	EFFECT ON THROUGHPUT.....	40
5.3.2	EFFECT ON THE END TO END DELAY.....	42
5.4	VARIATIONS IN PROCESS TIME USING HALF OF THE NUMBER OF USER NODE.....	43
5.4.1	EFFECT ON THE INTERNET AND SERVERS AT THE DATA CENTRE THROUGHPUT.....	44
5.4.2	EFFECT ON DISTRIBUTION SWITCHES THROUGHPUT.....	45
5.4.3	EFFECT ON THE END TO END DELAY.....	47
5.5	VARIATION IN PROCESSING TIME USING MAX USER NODES.....	48
5.5.1	EFFECT ON INTERNET AND THE SERVERS AT THE DATA CENTRE.....	48
5.5.2	EFFECT ON THE DISTRIBUTION SWITCHES.....	49
5.5.3	EFFECT ON END TO END DELAY.....	51
5.6	VARIATION IN THE ARRIVAL RATE USING HALF USER NODE.....	52
5.6.1	EFFECT ON THE INTERNET AND DATA CENTRE SERVERS.....	53
5.6.2	EFFECT OF ARRIVAL RATE ON THE DISTRIBUTION SWITCHES USING HALF NUMBER OF USER NODES.....	54
5.6.3	EFFECT ON THE END TO END DELAY.....	56
5.7	VARIATION IN THE ARRIVAL RATE USING MAXIMUM USER NODE ON THE NETWORK.....	57
5.7.1	EFFECT OF ARRIVAL RATE ON THE INTERNET AND SERVERS AT THE DATA CENTRE.....	57
5.7.2	EFFECT ON THE ARRIVAL RATE ON THE SWITCHES.....	59
5.7.3	EFFECT ON END TO END DELAY.....	61
5.8	UTILIZATION OF THE SWITCHES .....	62

5.9 SUMMARY.....	63
<b>CHAPTER SIX.....</b>	<b>65</b>
CONCLUSION.....	65
6.1 RESEARCH CONTRIBUTION.....	65
6.2 PROBLEMS AND LIMITATION.....	65
6.3 RECOMMENDATION AND FUTURE WORKS.....	66
<b>REFERENCES.....</b>	<b>68</b>
APPENDIX A: RESEARCH SCHEDULE (GANTT CHART).....	73
APPENDIX B: UUM LOCAL AREA NETWORK (WIRED) DIAGRAM.....	74
APPENDIX C: TOTAL NUMBER OF USER NODES ON THE NETWORK.....	75
APPENDIX D: ROUND TRIP TIME ON THE NETWORK.....	78
APPENDIX E: THE SWITCH PORT USAGE ON THE NETWORK.....	79
APPENDIX F: THE DISTRIBUTION SWITCH UTILIZATION(HALF USER NODES).....	80
APPENDIX G: THE DISTRIBUTION SWITCH UTILIZATION(MAX USER NODES).....	81
APPENDIX H: THE INTERNET AND SERVER AT THE DATA CENTRE UTILIZATION(MAX USER NODES).....	82



## LIST OF TABLES

Table 1: A comparison of Actual RTT and model Acknowledgement.....	37
Table 2: The initial parameters and symbols.....	39
Table 3: The process time against the internet, and server2 and server3 throughput .....	39
Table 4: The min end to end delay and process time on the Internet and the servers at the Data Centre.....	42
Table 5: The process time and the throughput on the internet and the servers.....	44
Table 6: The process time and the corresponding throughput on the switches.....	45
Table 7: The processing time and the minimum end to end delay on the network....	47
Table 8: The results of processing time on the internet and the Servers at the data centre. ....	48
Table 9: The processing time and throughput on the core switch and distribution switches. ....	49
Table 10: The processing time and end to end delay on the internet and the servers at the data centre. ....	51
Table 11: The arrival rate and the corresponding throughput on the Internet and Servers at the data centre.....	53
Table 12: The arrival rate and the corresponding end to end delay on the switches...54	
Table 13: The classification of low, medium and high throughput on the distribution switch .....	55
Table 14: The arrival rate and the corresponding end to end delay on the Internet and Servers at the data centre.....	56
Table 15: The results of arrival rate variation the internet and servers at the data centre.....	57
Table 16: The results of arrival rate variation on the distribution switches.....	59
Table 17: The classification of low, medium and high throughput on the distribution switch .....	61
Table 18: The results of arrival rate on min end to end delay.....	61
Table 19: The utilization of the Internet when using max user nodes.....	62
Table 20: The utilization of the distribution switches when using max user nodes....	63

# LIST OF FIGURES

Title	Pages
Figure 1: The Flow Diagram of the simulation methodology.....	4
Figure 2: Hierarchy of Modules in OMNeT++ .....	22
Figure 3: A snapshot the computer centre, Faculty of Economics, and the data centre on the Simulation Model.....	33
Figure 4: A snapshot of the data centre, gateway to the internet and FTM on the Simulation Model.....	34
Figure 5: A snapshot of convention centre, Kolej Eon, Palapes, PKP on the Simulation Model.....	34
Figure 6: A snapshot of Buka Kachi, FSK, FWB and FPK on the Simulation Model.....	35
Figure 7: A snapshot of 12 pc on a switch in the Simulation Model.....	35
Figure 8: A snapshot of 23 pc on a switch in the Simulation Model.....	36
Figure 9: The graph of the process time on against the internet, server2&3 throughputs.....	40
Figure 10. The graph of the process time on against the throughputs on the distribution switches.....	41
Figure 11: The graph of the process time on against the end to end delay on the network.....	43
Figure 12: The graph of the process time on against throughput on the internet and data centre servers.....	44
Figure 13: The graph of the process time on against the switches throughput on the network. ....	46
Figure 14: The graph of the processing time and end to end delay.....	47
Figure 15: The graph of the process time on against the throughput on the Internet, and the Servers at the data centre.....	49

Figure 16: The graph of the process time on against the throughput of the distribution switches.....	50
Figure 17: The process time and the end to end delay on internet and the servers at the data centre.....	52
Figure 18: The graph of the arrival rate and the throughput on the internet and the servers at the data centre.....	53
Figure19: The graph of arrival rate and throughput on the switches.....	55
Figure 20: The graph of arrival rate and the end to end delay.....	56
Figure 21: The graph of arrival rate on internet and the servers at the data centre..	58
Figure 22: The graph of arrival rate on the distribution switch.....	60
Figure 23: The graph of arrival rate on the end to end delay on the network.....	61

## LIST OF ABBREVIATIONS FOR THE DISTRIBUTION SWITCHES

Switch B1	COMPUTER CENTRE
Switch B2	FSKP/FKBM
Switch B3	FPP/FSK
Switch B4	RACK A PERPUSTAKAN
Switch B5	BENDAHARI
Switch B6	CONVENTION CENTRE
Switch B7	KOLEJ EON
Switch B8	PALAPES
Switch B9	BKP
Switch B10	FWB/FPAU
Switch B11	BUKIT KACHI
Switch B12	KOLEJ B.MUAMALAT
Switch B13	FTM
Switch B14	FACULTY OF ECONOMICS
Switch B15	PPK
Switch S	CORE SWITCH
Switch X	DATACENTER SWITCH 1
Switch Y	DATACENTRE SWITCH 2
Switch Z	SWITCH AT THE DMZ

# **CHAPTER ONE**

## **INTRODUCTION**

Computer networking enables people or devices to communicate with one another. The telephones are networked in the GSM and public telephone systems. Data networks connect several computers, making it possible for them to connect and exchange data. A data network can simply be created by connecting two computers together with a cable.

A voice and data network Local Area Network (LAN) is a collection of individual networks connected by network equipments to function as a single large network known as internetworking. Local Area Network makes it possible for multiple users in a small geographic area to access shared resources, exchange files and messages on a data network. WANs interconnect the LAN to make it possible for geographically dispersed users to share information. It is slower in comparison to a LAN, and usually requires a connection request in order to send data. This is made possible by service providers with a monthly tariff paid (Teare, 2008).

In a computer network that has switches as dominant network equipment, data packets are sent on a shared link via the switches. The switch will have to make a decision on which packet goes first. In a packet switched network a switch could be designed to service packets on a FIFO basis, so as to ensure that packet flows receive a specific share of the link's bandwidth and that the packets are not delayed in the switch for more than a certain length of time. When a network allows such packets flow to request the above treatment, it is said to

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