

## TABLE OF CONTENTS

	Page
Cover .....	I
Approval .....	II
Pernyataan Keaslian Tesis.....	III
Kata Pengantar .....	V
Table of Contents .....	VI
List of figures .....	VIII
List of Table .....	IX
Motto .....	X
Abstract .....	XI
Abstrak .....	XII
CHAPTER I    INTRODUCTION .....	1
<b>1.1.</b> Background .....	1
<b>1.2.</b> Problem Statement .....	3
<b>1.3.</b> Objectives of the Research .....	3
<b>1.4.</b> Thesis Contribution .....	4
<b>1.5.</b> Limitation of Works .....	4
<b>1.6.</b> Research originality .....	4
<b>1.7.</b> Outline Thesis Organization .....	5
CHAPTER II    LITERATURE REVIEW AND THEORY .....	6
<b>2.1.</b> Literature Review .....	6
<b>2.2.</b> Theory .....	21
<b>2.2.1.</b> Dual Stack .....	21
<b>2.2.2.</b> Tunneling .....	22
<b>2.2.3.</b> Translation .....	27
<b>2.2.4.</b> IPv4 .....	30
<b>2.2.5.</b> IPv6 .....	32
<b>2.2.6.</b> GNS3 & Jperf .....	34

CHAPTER III	RESEARCH METHODOLOGY .....	35
	3.1. Procedure of the Research .....	35
	3.2. General Research Model .....	36
	3.3. Proposed System Model .....	37
	3.4. Performance Analysis .....	37
	3.5. Emulation Process .....	38
	3.6. Performance Validation .....	45
	3.7. Summary .....	46
CHAPTER IV	RESULT AND DISCUSSION .....	47
	4.1. Testing Result .....	47
	4.1.1. Ping and Trace route Test for 6to4 Tunnel .....	47
	4.1.2. Ping and Trace route Test for dual stack.....	48
	4.1.3. Ping and Trace route Test for NAT-PT.....	50
	4.2. Jperf Results .....	52
	4.2.1. Analysis of the Latency transition.....	52
	4.2.2. Analysis of the Throughput .....	53
	4.2.3. Analysis of the Packet loss .....	54
	4.3. Discussion .....	56
CHAPTER V	CONCLUSION .....	58
	5.1. Conclusion .....	59
	5.2. Future work Recommendations .....	60
References	.....	61
Appendices	.....	62
	Configuration Coding Appendices .....	
	Pernyataan Persetujuan Publikasi Karya Ilmiah .....	
	The Journal paper .....	
	Turnitin .....	

## LIST OF FIGURES

Figure 2.1 Dual Stack System .....	22
Figure 2.2 Tunnel Broker Mechanism .....	24
Figure 2.3 6to4 Mechanism .....	25
Figure 2.4. ISTAP Mechanism .....	26
Figure 2.5 NAT-PT Mechanism .....	28
Figure 2.6 BIS Mechanism .....	29
Figure 2.7. 3 Types of IP Addressing Version 6 .....	33
Figure 2.8. IPv6 addresses basically use 128 bits .....	34
Figure 3.1. Transition IPv4 to IPv6 .....	36
Figure 3.2 Proposed System Model .....	37
Figure 3.3 Emulation Process .....	38
Figure 3.4 Tunneling Topology .....	40
Figure 3.5 Dual Stack Topology .....	42
Figure 3.6 NAT-PT Topology .....	44
Figure 4.1. Ping Test Result of the Tunneling Mechanism .....	47
Figure 4.2. Trace route Test Result of the Tunneling Mechanism .....	47
Figure 4.3. Ping Test Result of the Dual Stack Mechanism .....	49
Figure 4.4. Trace route Test Result of the Dual Stack Mechanism .....	49
Figure 4.5. Ping Test Result of the Translation NAT-PT Mechanism .....	50
Figure 4.6. Trace route Test Result of the Translation Mechanism .....	51
Figure 4.7 Latency Analysis of the transition mechanisms .....	52
Figure 4.8 Analysis of the Throughput .....	53
Figure 4.9 Analysis of the Packet loss .....	54

## LIST OF TABLES

Table 2.1. Previous Study .....	15
Table 2.2. Divided of IP Address of Version 4 .....	31
Table 3.1. Host-1 and Host-2 IP Addresses .....	40
Table 3.2. Headquarters', ISP and Branch IP Addresses .....	41
Table 3.3. Host-1 and Host-2 IP Addresses .....	43
Table 3.4. Headquarters', ISP and Branch IP Addresses .....	43
Table 3.5. Host-1 and Host-2 IP Addresses .....	44
Table 3.6. Headquarters', ISP and Branch IP Addresses .....	45
Table 4.1. Ping Test Results .....	48
Table 4.2. Latency Test Results .....	48
Table 4.3. Ping Test Results .....	49
Table 4.4. Latency Result .....	50
Table 4.5. Ping Test Result .....	51
Table 4.6. Latency Result .....	51
Table 4.7. Similar analysis of the three performance mechanisms .....	55