

CONTENTS

APPROVAL PAGE

SELF DECLARATION AGAINST PLAGIARISM

ABSTRACT	i
ACKNOWLEDGMENTS	ii
PREFACE	iv
CONTENTS	v
LIST OF FIGURES	viii
LIST OF TABLES	ix
I INTRODUCTION	1
1.1 Background	1
1.2 Problem Identification	3
1.3 Objective and Contributions	3
1.4 Scope of Work	4
1.5 Research Methodology	4
1.6 Hypothesis	5
1.7 Research Plan and Action Point	6
II Basic Concepts	8
2.1 Private Network	8
2.2 Wide Area Network (WAN)	8
2.3 Virtual Private Network (VPN)	9
2.4 Quality of Service (QoS)	10
2.4.1 QoS Parameters	11
2.5 Economic Analysis	11
2.5.1 Capital Expenditure (CAPEX)	12
2.5.2 Operational Expenditure (OPEX)	12
2.5.3 Economic Feasibility Indicator	12

2.6	Regulation of Private Network	14
III	SYSTEM MODEL AND THE PROPOSED DESIGN	15
3.1	Overview	15
3.2	System Model and Scenarios	15
3.3	Simulation Scenarios	18
3.4	Data Collection Scenarios	18
3.4.1	Observed Parameters	19
3.4.2	Data Collection Methodology	19
3.5	Performance Parameters	19
3.5.1	Throughput	20
3.5.2	Delay	20
3.5.3	Jitter	20
3.5.4	Packet Loss	20
3.6	Regulatory Compliance	20
3.6.1	Secure and Responsible Use of Information Technology . .	21
3.6.2	Data Protection and Network Security Standards	21
IV	PERFORMANCE EVALUATIONS	22
4.1	Technical Analysis	22
4.1.1	Network Topology	22
4.1.2	IP Addressing Scheme	24
4.1.3	VPN Configuration and Implementation	26
4.1.4	Conclusion of Analytical Technical	30
4.1.5	Analysis Based on QoS Metrics	30
4.2	Economic Analysis	34
4.2.1	CAPEX and OPEX Fee Plan	34
4.2.2	Revenue Projection	40
4.2.3	Feasibility Analysis	43
4.2.3.1	Net Present Value (NPV)	43
4.2.3.2	Internal Rate of Return (IRR)	44
4.2.3.3	Profitability Index (PI)	46
4.2.3.4	Payback Period (PP)	46
4.2.4	Conclusion Techno-Economic Analysis	47
4.3	Regulation Analysis	48
4.3.1	Policy Brief Introduction	48
4.3.2	Problem Identification	49
4.3.3	SWOT Analysis of Regulation	51

4.3.4	Related Regulations	51
4.3.5	Global Private Network Regulations	52
4.3.6	Infocomm Media Development Authority Singapore (IMDA)	52
4.3.7	Regulatory Impact	54
4.3.8	Policy Recommendations	54
V	CONCLUSIONS	55
5.1	Conclusions	55
	REFERENCES	56