

TABLE OF CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	ABSTRACT	v
	LIST OF TABLES	xii
	LIST OF FIGURES	xiii
	LIST OF SYMBOLS AND ABBREVIATIONS	xv
1	DENIAL OF SERVICE	1
1.1	INTRODUCTION	1
1.2	INTERNET SERVICES FOR TRANSMISSION APPLICATION	2
1.2.1	Information Services for Various Protocol	4
1.2.2	Communication Services of Internet	6
1.2.3	Data Transfer Services across the Internet	7
1.2.4	Communication Accessibility	9
1.2.5	Social Impact of Internet activities	9
1.3	NETWORK SECURITY	10
1.3.1	Impact of Vulnerabilities	11
1.3.2	Types of Vulnerabilities	11
1.3.2.1	Technological vulnerability	12
1.3.2.2	Configuration vulnerability	13
1.3.2.3	Security policy vulnerability	14
1.3.3	Impact of Threats and attacks	15
1.4	DEFENSE MECHANISMS	16
1.4.1	Routers and Switches	17
1.4.2	Firewalls	17

CHAPTER NO.	TITLE	PAGE NO.
1.5	JAMMERS	18
	1.5.1 Constant jammers	19
	1.5.2 Deceptive Jammers	19
	1.5.3 Reactive Jammers	20
	1.5.4 Random Jammers	20
1.6	JAMMING	21
	1.6.1 Types of Jamming	22
	1.6.2 Physical Jamming	22
	1.6.3 Virtual Jamming	22
	1.6.4 Synchronization Signal Jamming (SSJ)	23
	1.6.5 Primary Synchronization Signal Jamming	23
	1.6.6 Physical Uplink Control Channel Jamming	23
1.7	DENIAL OF SERVICE	24
	1.7.1 Roots of DoS Attacks	26
	1.7.2 UDP Flood Attack	28
1.8	DISTRIBUTED JAMMERS	29
1.9	IMPORTANCE OF JAMMER'S ROLE	31
2	LITERATURE REVIEW	33
	2.1 RESEARCH GAP	72
	2.2 ORGANIZATION OF THE THESIS	73
3	DENIAL OF SERVICE ATTACK IN DISTRIBUTED WIRELESS NETWORK BY DISTRIBUTED JAMMER NETWORK: A BIRTH – DEATH RANDOM PROCESS ANALYSIS	75
	3.1 INTRODUCTION	75
	3.2 MATHEMATICAL BASIS	77
	3.2.1 Random Process	77

CHAPTER NO.	TITLE	PAGE NO.
	3.2.2 Random Variable	78
	3.2.2.1 Discrete random variables	78
	3.2.2.2 Continuous random variables	79
	3.2.3 Linear Birth-Death Process	82
3.3	BIRTH-DEATH RANDOM PROCESS	
	ANALYSIS OF DOS IN A DWN WITH A DJN	84
	3.3.1 General case	84
	3.3.2 Linear Model When $\lambda_n = n\lambda$, $\mu_n = n\mu$	85
3.4	RESULT AND DISCUSSION	86
	3.4.1 Sample Test case analytic of the Birth-Death Random Process	87
	3.4.2 Scenario 1 – Birth-Death Process	89
	3.4.3 Scenario 2 – Simple Birth-Death Process	90
	3.4.4 Scenario 3 – Linear Birth-Death Process	90
	3.4.5 Summary of the Scenarios Considered and the result Obtained	91
4	DISTRIBUTED JAMMER NETWORK:	
	PROBABILITY DISTRIBUTION OF THE NODE	93
	4.1 INTRODUCTION	93
	4.2 JAMMING MECHANISM	93
	4.3 PROBABILITY DISTRIBUTION OF THE NODE	94
	4.4 CONSIDERATION OF THE BIRTH RATE AND DEATH RATE	95
	4.4.1 Model with $\lambda = \mu$ for any value of n General case	97
	4.5 RESULT AND DISCUSSION	99

CHAPTER NO.	TITLE	PAGE NO.
5	IMPLEMENTATION MECHANISM FOR ATTACK	
	SOURCE MACHINE FOR JAMMER SCHEMA	100
5.1	INTRODUCTION	100
5.2	ENVIRONMENT SETUP FOR DoS	
	NETWORK TOPOLOGY	100
5.3	METRICS	101
5.4	TOPOLOGIES SETUP	101
	5.4.1 Simulation Topology – 1	102
	5.4.2 Simulation Topology – 2	105
5.5	PERFORMANCE COMPARISON WITH	
	OTHER MECHANISMS	108
6	CONCLUSIONS FUTURE WORK	113
	REFERENCES	115
	LIST OF PUBLICATIONS	121