

List of Figures

FIGURE 2.1: NIST STACK OF CLOUD COMPUTING.....	6
FIGURE 2.2 : LAYERED STACK OF SaaS	8
FIGURE 2.3 : IDC SURVEY ON CLOUD COMPUTING ISSUES AND CHALLENGES.	11
FIGURE 3.1 : WORKING OF SHARED KEY CRYPTOGRAPHY	29
FIGURE 3.2 : OVERVIEW OF PUBLIC KEY CRYPTOGRAPHY.....	30
FIGURE 3.3 : AUTHENTICATION	34
FIGURE 3.4 : PGP ENCRYPTION	36
FIGURE 3.5 : PGP DECRYPTION	36
FIGURE 3.6 : PROPOSED METHOD FOR CLOUD COMPUTING	38
FIGURE 3.7 : KERBEROS AUTHENTICATION IN CLOUD COMPUTING	39
FIGURE 3.8 : AUTHENTICATION BY PROPOSED FRAMEWORK	40
FIGURE 3.9 : CONFIDENTIALITY BY PROPOSED FRAMEWORK.....	42
FIGURE 3.10 : NON REPUDIATION PROPOSED FRAMEWORK.....	42
FIGURE 3.11 : AVISPA TOOL ARCHITECTURE	44
FIGURE 3.12 : TLS VISUALIZATION USING AVISPA.....	45
FIGURE 3.13 : TLS INTRUDER SIMULATION	45
FIGURE 3.14 : PROTOCOL SIMULATION(MESSAGE SEQUENCE CHART) RESULT.....	48
FIGURE 3.15 : EXISTING PROTOCOLS Vs. KERB-PGP (EXECUTION TIME)	50
FIGURE 3.16 : RESULT COMPARISION	51

FIGURE 3.17 : CLIENT REGISTRATION.....	53
FIGURE 3.18 : LOGIN - BY ENTERING USERNAME AND PASSWORD.....	54
FIGURE 3.19 : SEND REQUEST TO AUTHENTICATION SERVER FOR SERVICE.....	54
FIGURE 3.20 : PUBLIC KEY GENERATION	55
FIGURE 3.21 : TICKET GENERATION	56
FIGURE 3.22 : SERVICE REQUEST TO CSP	57
FIGURE 3.23 : NON REPUDIATION	57
FIGURE 4.1 : SMS OTP EXAMPLE IN FORM OF A MOBILE TAN.....	60
FIGURE 4.2 : USER AUTHENTICATION ARCHITECTURE USING MOBILE SMS	61
FIGURE 4.3 : WORKING OF OTP USING MOBILE AUTHENTICATION MECHANISM.....	61
FIGURE 4.4: GROUP AND PERMISSION BASED ACCESS CONTROL	62
FIGURE 4.5: OFMC RESULT OF OTP PROTOCOL	63
FIGURE 4.6: MSC FOR OTP PROTOCOL SIMULATION	64
FIGURE 4.7: SECURITY RISK AGAINST VARIOUS ATTACK	65
FIGURE 5.1 : MULTIFACTOR AUTHENTICATION OVERVIEW	70
FIGURE 5.2:BIOMETRIC CHARACTERISTICS: PHYSIOLOGICAL CHARACTERISTICS AND BEHAVIOURAL CHARACTERISTICS	73
FIGURE 5.3 : BLOCK DIAGRAM OF A GENERAL BIOMETRICS RECOGNITION SYSTEM	74
FIGURE 5.4 : NEW USER REGISTRATION IN CLOUD USING GENERIC BIOMETRIC SYSTEM	76
FIGURE 5.5 : REGISTERED USER REGISTRATION IN CLOUD USING GENERIC BIOMETRICS RECOGNITION SYSTEM.....	77
FIGURE 5.6 : NEW USER REGISTRATION IN CLOUD	79

FIGURE 5.7 : MULTI- FACTOR AUTHENTICATION AND SUCCESSFUL AUTHORIZATION.....	80
FIGURE 5.8 : SERVER SIDE REGISTRATION.....	84
FIGURE 5.9 : LOGIN.....	85
FIGURE 5.10 : OTP AS A PASSWORD.	85
FIGURE 5.11 : BIOMETRIC AUTHENTICATION.....	86
FIGURE 5.12 : FACE CAPTURING AND AUTHENTICATION.....	86
FIGURE 5.13 : VERIFICATION/AUTHENTICATION.....	87
FIGURE 5.14 : SERVICE ACCESS REQUEST.....	87
FIGURE 5.15 : VALIDATION OF THE REQUEST.	88
FIGURE 5.16 : ACCESS GRANTED.	88