

STUDY ON SECURITY AND QUALITY OF SERVICE IMPLEMENTATIONS IN P2P OVERLAY NETWORK FOR EFFICIENT CONTENT DISTRIBUTION

K.Ramalakshmi¹, P.K.Sasikumar²

¹P.G Scholar Computer Science Eng, Dept. of CSE, Tamilnadu College of Engineering, Coimbatore, India

²Assistant Professor, Dept. of CSE, Tamilnadu College of Engineering, Coimbatore, India

Abstract

Peer-to-peer (P2P) is a distributed system without any centralized control or hierarchical organization nodes organize itself in a dynamic way. It allows different applications to achieve efficient and simple file sharing. Without any authentication adversary nodes can spoof the identity and spoil the integrity by falsifying the messages in the overlay. This enables malicious nodes to launch man-in-the-middle or denial-of-service attacks and many security related attacks. P2P systems require a sufficient amount of trust from their nodes which are all participates in the network for AAA (Authentication, Authorization and Availability). From the analysis it aims to provide the prediction of optimized path in the network for efficient file sharing and the identification of necessary security methods in the network to provide security to decentralized p2p network.

Keywords: Decentralized, fault tolerance, access latency, double layer security, swarm intelligence, self organized, trust management, threshold value, secured network, integrity, authentication, authorization.

1. INTRODUCTION

Overlay network is a computer network which can be built on top of another underlying network with the purpose to implement the services which is not available in the existing network. The main goal of the overlay network is to interconnect several LANs together. Because of the nodes of P2P run on top of the internet it must be an overlay network. P2P is a distributed system without any hierarchical organization or centralized control nodes can communicate with each other and organize itself in a dynamic way. Each node may act as a client or server or router. A P2P network provides self organized and fault tolerant mechanisms to locate nodes anywhere on a network without maintaining a large amount of routing state even in large node densities. Peers in the network form a self-organized distributed overlay networks that are overlaid with the Internet Protocol (IP) networks which is built on the underlying physical network to provide the services which is not available in the existing network and has the features such as robust wide-area routing architecture, efficient data items search , nearby peers selection, redundant storage, permanence, hierarchical naming, trust and authentication, anonymity, massive scalability, fault tolerance and supports efficient resource sharing.

P2P overlay network can be viewed as a model of spanning a large spectrum of the communication nodes framework, which specifies a cooperative, multiple, autonomous, component databases, fully-distributed network design. It is built at the application layer and use the underlying network for the exchange of messages. A node (peer) may act as a client or a server or router whenever an object is requested or served or forwarded. P2P networks feature an enhancement of the use of information, bandwidth and computing resources. Structured P2P networks implements DHT (Distributed Hash Tables) which uses the consistent hashing to assign each file to a particular peer as ownership to that file that enables search for a resource on the network by using the hash tables. Unstructured P2P networks will not impose a particular topology on the overlay network by design but rather the nodes form the random connections to each other. Unstructured P2P networks are highly robust in the presence of high rates of churn i.e., when large number of peers are suddenly joining and leaving the network. Replicated content distribution of P2P network enables the demanded contents to be get closer to the clients by geographically multiplying the source of information which in turn reduce both the access latency and network traffic. QoS is a method to assure a bandwidth relationship between individual applications or protocols. It minimizes the cost, access latency and increase the availability by using the replication technique.

2. SWARM INTELLIGENCE

Swarm Intelligence (SI) depends on the collective behavior of decentralized, self-organized systems which may be natural or artificial. This system is developed in the work on artificial intelligence. SI systems consist of a distributed population of some simple agents as solutions can interact with one another locally and also with their environment. The inspiration often comes from nature, especially biological systems. Those agents will follow some very simple rules without any centralized control structure dictating how individual agents should behave local and to a certain degree random interactions between such agents lead to the upcoming usage of "intelligent" global behavior which may be not known by the individual agents. Examples of SI in nature may include bee colonies, ant colonies, fish schooling, bird flocking, animal herding and bacterial growth and used in robots is called swarm robotics, while 'swarm intelligence' refers to the more general set of algorithms. 'Swarm prediction' will be used in the forecasting problems. The swarm intelligence is implemented and the network security has been improved and the functions of the swarm intelligence works based on the degree of replication. The degree of replication defines the percentage of participating nodes having the same files over the network Bio-inspired algorithms are increasingly attracting attention in solving optimization problems. In an overview of biological facts about social insects, their inspired algorithms and application areas in computer engineering and science are presented. Among all social insects, the foraging behavior of ant and bee colonies, and how it can be used to solve search problems, is particularly popular.

2.1 Artificial Bee Colony Algorithm

Artificial bee colony algorithm (ABC) is a meta-heuristic algorithm which simulates the collective behavior of honey bees. The ABC algorithm has three types of bee phases called scout bee, employed bee and onlooker bee. The employed bee phase uses the deterministic selection and the onlooker bee phase uses the probabilistic selection to find the sources in the neighborhood of the solutions by local searches. In the scout bee phase efficient food sources will be identified by the flooding of request in the searching process for solutions and new solutions are inserted instead of them to explore new regions in the search space. The algorithm has a well-balanced exploration and exploitation ability.

2.2 Comparison with other Search Methods

Swarm Intelligence based optimization algorithms mimic the nature to drive a search towards the optimal solution. A key difference between SI and direct search algorithms such as random walk and hill climbing is that instead of a single solution SIOAs use a population of solution for every iteration. As a population of solution is processed in an iteration the population of solutions will be the outcome of each iteration. SIOA population can be used to converge to the

optimum solution if an optimization problem has a single optimum. However if an optimization problem has multiple optimal solutions an SIOA can be used to capture them in its final population. SIOAs include the Ant Colony Optimization (ACO) algorithm, the Genetic Algorithm (GA) and the Particle Swarm Optimization (PSO) algorithm. Common to all population-based search methods SIOA generates variations of the solution being sought. Some search methods like greedy criterion can be used for the decision on which generated solution to retain. Such a criterion can accept the new solution if it increases the value of the optimized result. Swarm intelligence has also been applied for data mining.

Swarm based P2P model uses Alliance theory for peering where high contributing nodes (Power Nodes) have high ranking based on their share ratios and nodes may be served by the direct server and in small world networks every node can also be connected to every other node in the swarm by the small number of path length. Alliance members have common trust and treaty as a node receives new content it forwards among its alliance members. First alliance members are mutually trusted and all members of an alliance have an active connection with other members and also applying security policies in alliance is much easier.

3. RESEARCH ISSUES IN QUALITY OF SERVICE AWARE CONTENT DISTRIBUTION AND DIFFERENT KINDS OF SECURITY IMPLEMENTATION IN P2P NETWORK

Table-3.1 : Quality of service aware content distribution and different kinds of security implementation in p2p network

Algorithm	Remarks	Advantages	Improved Parameters
P2PBA(P2P Bee Algorithm), AODV reactive routing protocol [21].	If the packets size- 1024,size of each packet is 64 bytes then times in seconds will be 8s 70s 100s	Time efficient, robust sharing mechanism, lower control overhead , higher success ratio, changing mobility and high node density.	Optimized search process, Efficient file sharing better sources to selective retrieval.
Intelligent Replica placement algorithm, robust query searching technique [6].	1. Load of the requested content- from 2.0mb to 5.0 Mb. 2. Delay of QIRM is significantly less than the delay of VIRAT. 3. QIRM has throughput and more efficiency than VIRAT. 3. Query sending rate -from 250Kb to 1Mb. 4.Bandwidth utilization of QIRM is 80-90% & VIRAT 60-70%	Less access latency and network traffic, scalability, tolerance, reduced search latency.	Throughput, delay, bandwidth, query efficiency, network utilization.
Peer Rank and Selection Algorithm, Rank based peer to peer searching strategy , meta based search [31].	1. Estimated page rank is 0.25 probability distribution and initial value is between 0.1 and n-1 and 0.5 to 0.2.is. 2.In naive distribution topic distribution-0.03% and proceedings distribution-1.3% but expertise based selection improves the precision by 0.15% (topic) and 15% (proceedings) distribution. 3. Super peer-more than 40% traffic saved.	Better search performance and user interface, reduced routing overhead, reduced query cost, decreased traffic per query.	Bandwidth, query efficiency, average routing latency.
Intelligent replica placement and effective load balancing techniques [5].	1. Load of the requested content - from 250bytes to 2000bytes. 2. Query sending rate- from 250Kb to 1Mb. 3. Rate increases and delay remains constant in without LB but decreases in LB. 4.Delay & packet lose of LB is less than the delay & packet lose of withoutLB, throughput of LB is more. 5. Simulation time-from 10 to 20 seconds.	Availability of data, reduced maintenance cost, strong connectivity.	Better throughput, query latency, bandwidth, load balancing.
Efficient replica placement and clustering algorithm [3].	1. Packet delivery ratio of the EACNCRC is improved than QIRMA with less energy usage.. 2. Throughput gets increased with less delay and reduced overhead.	Availability of data, reduced maintenance cost, strong connectivity, less energy consumption.	Better throughput, query latency, bandwidth, load balancing, cost.
dynamic search (DS) algorithm [24].	1 In power-law graphs DS will be better than flooding by 25 times and better than RW by 58 times and in bimodal topologies DS is better than flooding by 186 times and better than RW by 120 times 2.If 100 distinct objects With replication of 100,000 distinct objects and best 20 percent of peers have 45 percent uptime which achieves the median session duration time to be 20 minutes.	Search performance, intelligent search, success rate , query hits.	Search time, cost, query messages, query efficiency, and search efficiency.

	<p>3. Dynamic querying model has Poisson distribution with the idle time as 50 minutes</p> <p>4. MBFS with APS learning, the transmission probability p is set as 0.2.</p> <p>5. SE of DS is 24 percent better than that of RW, and 31 times better than that of MBFS.</p>		
Dynamic Adaptation of Connection algorithm dynamic distributed hash table (DDHT), round-trip time (RTT)[2].	<p>1. DDHTs- dynamic updates, scalable, fault-tolerant, administration-free and efficiently handle large volume of data items</p> <p>2. RTT-very fast, high qualities dynamic tree adaptation (minimizes the service disruption).</p> <p>3. It speeds up the connection and re-connection .</p>	Fault-tolerant, administration free, minimizes any service disruption	Fast access, quality tree, adaptation.
Adaptive search algorithm Process Query Receive Query Hit [12].	<p>1. Proposed method decreases the response time where minimum bandwidth and maximum latency as 2 Mbps and 20 msecs. respectively.</p> <p>2. Reduced cost for a node is 6.25.</p> <p>3. A weigh of 65% to the transfer speed and 20% to latency and the remaining 15% to the past response (popularity of the peer) is given.</p> <p>4. If 1000 nodes and 50 different objects then degree of node varies from 3 to 12 with TTL limit is from 1 to 5.</p>	Improves the scalability, improved performance, Minimized message overhead.	Latency, bandwidth, low latency and less congestion.
First-In-First-Out algorithm Tree based Interactive Multimedia System (TIMES)[33].	<p>1. It satisfies the large number of non-synchronization Requests.</p> <p>2. Achieves the interactive services.</p> <p>3. Peer will cache the first initial 3 minutes of video and will never replaces this part until it depart</p>	Interactive operations, less interruption, limited buffer space.	Reduce the server loading, flexibility, Bandwidth.
ROMEO(Remote Collaborative Real-Time Multimedia Experience over the Future Internet) resource over-reservation techniques [10].	<p>1. DVB-T2 -3D media's live simultaneous delivery.</p> <p>2. Super-peer- improves scalability.</p> <p>3. Enhances the service provisioning and has real-time control over the flow prioritization.</p> <p>4. Packet delay and jitter control is achieved by traffic load balancing and control of unnecessary congestion occurrence.</p>	Low bandwidth, small delay, low jitter, less loss, reduction of signalling overhead increased resource utilization, flexible and cost-effective control mechanisms.	High quality real-time collaboration, multiple enhancement layers of views without high complexity and buffering requirement, network utilization.
Data pipelines, asymmetric approach[15].	<p>1. Asymmetric approach- reduces the data access latency by 20-23% while symmetric approach has 12-18% of access latency.</p> <p>2. Transmission rate is increased as 5Mbps & has no network congestion.</p> <p>3. 30-50% less data traffic than the Simple Cache Approach is achieved by cooperative cache schemes (ICC, SCC, ACC) .</p>	Removal of processing overhead and reduced data processing delay.	End-to-end interaction, traffic control.
Optimized Bio-inspired Algorithm (OBAME). ant colony-inspired	Among 20 nodes 200, 400, 600, 800, 1000 queries can be answered by OBAME within the particular response time which outperforms the AVAs and BCAs by reduced response time with reduced network traffic.	Maximized search efficiency in P2P databases, solving optimization problems, eliminate flooding.	Network traffic, query response time. availability, efficiency, accuracy.

algorithms (ACAs) and bee colony- inspired algorithms (BCAs)[13]			
Bio-inspired resource discovery scheme, Q-learning and erasure codes(Reed-Solomon) random algorithm, a group partition algorithm highest available first (HAF) algorithm[20].	1.If 10000 nodes, average degree of a nodes in the network is 3.5, 1000 objects distributed 100 queries then one query is propagated every 20 seconds on average. flood of query message -production is regulated. 80% of the nodes are up and 50% of 'Down' nodes 2. Hit rate threshold δ - 0.3 thrlrd H is 0.6. 3. Availability threshold-0.4. The maximum number of blocks k for an object - 12. TTL value is 6 available storage $\geq 30\%$	1.Efficient resource discovery and availability of desired objects 2.Erasure codes replication with less number of available blocks to construct original files with coded fragments saves storage space and bandwidth. 3.Power peer table-maintains data about number of hits in the node to enhance the availability of popular objects.	Query success rate and availability and reduces the network traffic.
Probabilistic Modelling, structure learning and parameter learning [4].	1. Filtering with routing updating table searching performance gets improved as 90%. 2.Global optimum is achieved by efficient training and decoding based on dynamic programming and parameter estimation. 3.1 million nodes with a query rate of 1000 queries per second, then network traffic will be less than that of 0.07%. 4. Communication costs is between 0.03% and 0.07% with reduced communication bandwidth as 50%	Save peers from their blindness, fast resource discovery, cost-effective, accuracy of 90%,reduced loss.	Reliability, bandwidth, availability, throughput, query latency
DABC (Differential Artificial Bee Colony), stochastic algorithms[23].	1.For 10D problem- solution is 6.78e-20(f5) 2.For 30D problem- solution is 4.12e-18(f5) 3.For 50D problems- solution is 4.34e-17(f5) 4.While compare to other solution proposed solution achieves 9.26e-18(f5)	Convergence,quality of solution, robustness, better search strategy.	Solutions to dynamic optimization problems , suitability, convergence rate.
1.Automated Red Teaming (ART)with multi-objective evolutionary algorithms such as SPEAII and NSGAI 2.Multi-objective bee colony optimization (MOBCO) algorithm with non-dominated selection and crowding	1.70% of the bees- follow a dance selected from the top 50% (in terms of crowding distance) of the bees in <i>B</i> waggle 2.20% of the bees follow the next 30% of the dance in <i>B</i> waggle, 3. Last 10% of the bees follow the balance 20% of the dance in <i>B</i> waggle. 4. MOBCO is able to achieve a good convergence compared to NSGAI. Crossover rate and mutation rate is N/A 1.33 x	Robustness ART controller-efficient communication proper loading and execution between different modules.	End to end communication and execution, improved performance.

distance ranking approach [17].			
Artificial bee colony algorithm (ABC)[18].	<ol style="list-style-type: none"> 1. In 14 bus system total active and reactive power loads on the system are 28.7 MW and 16.3 MV Ar with voltage as 1.0 p.u. then the initial power loss will be 511.4 kW the power loss after reconfiguring as 464.6kW. 2. Energy saving and cpu time as 8.15 and 4.9 3. For 33 bus system total load conditions are 5058.25 kW and 2547.32 kvar with initial losses are 202.68 kW. 	Minimized power loss, high node density.	Load balancing, voltage profile improvement, better sources to selective retrieval.
Fast mutation artificial bee colony algorithm or FMABC[29].	<ol style="list-style-type: none"> 1. 50% employed bees and 50% onlooker bees (SN=15), limit=100. 2. Function optimum than ABC. 3. Mean best and std dev (f7) for ABC is 0.1155 0.1201 and FMABC is 8.8818e-16 ,0 respectively dimension 10 in dimension 30 mean best and std dev (f7) for ABC is 1.6832 1.8912 and FMABC is 8.8818e-16 0 	Avoiding the falling into local optimal, high node density.	Higher stability of solutions, load balancing, improved convergence rate, Performance.
Multi-Objective Artificial Bee Colony (MOABC) algorithm with Pareto concept and external archive strategy [28].	<ol style="list-style-type: none"> 1. MOABC algorithm is better than MOCLPSO and NSGA-II optimization algorithms. 2. In convergence metric MOABC, MOCLPSO and NSGA 's Median 2.8035e-005, 8.1531e-003, 3.9688e+000 and Std 8.9540e-003, 1.9448e-002, 1.4822e+000 will be respectively. In diversity metric MOABC, MOCLPSO and NSGA 's Median 4.7318e-001, 7.5949e-001, 1.1187e+000 and Std 2.7989e-001, 4.2953e-001, 8.8914e-002 will be respectively. 	Less control parameters, Robustness, performance.	Efficient solutions for multimodal and multidimensional optimization problems.
Modified fast marriage in honey bee optimization (MFMBO) [25].	<ol style="list-style-type: none"> 1. Success rate and speed of MFMB is better than the ABC, QB and FMBO with the tolerance of answer is equal or less than 10^{-2} and success rate as 100% of all 2. Improves the fitness of brood by using the selected worker. 	Faster, robustness, scalability, tolerance.	Success rate, fitness, speed.

Table-3.2: quality of service aware content distribution and different kinds of security implementation in p2p network

Algorithm/method	Remarks	Advantages
peer authorization protocol (PAP), private key generator (PKG), NAT device, digital rights management (DRM) techniques [30].	<ol style="list-style-type: none"> 1. PAP-to differentiate illegal nodes. 2. Identity-based signatures-IBS (authorization verification), Gossip Trust System time stamped tokens -to identify pirated copies through secure file indexes. 3. 10 PC-based distribution agents for a swarm size of 2,000 peers. 4. 99.9 percent of illegal prevention rate in Gnutella, KaZaA and Freenet is achieved and 85-98 percent prevention rate on eMule, eDonkey, Morpheus. 	System performance, minimum delivery cost, higher content availability less overhead.
Trusted Computing Group (TCG), DAA (direct anonymous attestation)- sign& verify algorithm, Trusted Platform Module(TPM)[22].	<ol style="list-style-type: none"> 1. TPM-integrity, privacy. 2. Pseudonymous authentication mechanism-peers can authenticate other peers. 3. Authenticated key exchanges- integrated with the SSL/TLS and IPSec protocol. 	Access control, accountability, confidentiality and integrity.

Origin server (OS), Trust Index Table (TIT)[7].	<ol style="list-style-type: none"> 1. Trust value calculation-On success of data delivery ratio &search time for trusted nodes. 2. Query sending rate-from 250Kb to 1Mb increases when trust evaluation is applied. 3. Delay is decreases at trust evaluation and drop is constant in the trust based case. 	Increased success ratio with reduced delay and drop.
Signature scheme, random linear coding based content distribution [11].	<ol style="list-style-type: none"> 1. Random linear coded Scheme-secure distribution with negligible overhead for large files. 2. For 10MB file the overhead is less than 0.1% of the file size. 	Integrity, less overhead for large files, increased efficiency, improved robustness and reduced downloading time.
Poisoning resistant security framework [19].	<ol style="list-style-type: none"> 1. Poisoning-resistant security framework- effectively and efficiently defend against content poisoning through man-in-the-middle (MITM), Sybil and DoS attacks. 2. DHT-to content availability& scalability. 3. Scalable probabilistic verification scheme-to reduce verification overhead. 	Integrity, availability and scalability.
Content authentication protocol, rational content access sub protocol secure content distribution protocol [9].	<ol style="list-style-type: none"> 1. Byzantine agreement -authentication and cryptographic puzzles. 2. Signature generation sub protocol (SGS)-authenticity and integrity. 3. Signature verification sub protocol (SVS)-trust is on Trust Management System(TMS). 	Integrity, reliability, secure and authentication.
Integrated system solution for secure P2P content distribution based on Network Coding(ISNC)[14].	<ol style="list-style-type: none"> 1. Network coding- improve resilience to peer churn & shorter the downloading time. 2. Secure network coding signature scheme- group network coding authentication. 3. An identity-based malicious peer identification scheme- Bottom-up & Top-down approach to identify malicious peer. 	High throughput, high security, high reliability, reduced computation overhead and improved overall efficiency.
Trust evidence-identity, public key, independent security assessment, PGP, swarm intelligence-ant colony algorithm [16].	<ol style="list-style-type: none"> 1. Backtracking- high certainty trust paths and the ability to discover alternate paths. 2. Trust evidence optimized routing allows faster distribution. 3. Swarm intelligence -shortest path through ant based protocol (Probabilistic ant routing). 	Authentication, access-control, availability.
Identity-based encryption, Private Key Generator (PKG), asymmetric key algorithms [26].	<ol style="list-style-type: none"> 1. IBE-Useful where pre-distribution of authenticated keys is inconvenient and eliminates the need for a public key distribution infrastructure. 2. PKG- private key to decrypt or sign messages. 3. RSA algorithm for safer data replication. 	Secure Authenticity, integrity, confidentiality, reduces overheads, prevent Sybil attacks, query efficiency, high replica hit rate.
Security certificates, X.509, ASN, DER, Certification Authority (CA), firewall, PKI, EJBCA(Enterprise Java Bean Certificate Authority) associated with OpenSSL[32].	<ol style="list-style-type: none"> 1. ASN.1 distinguished encoding rules (DER) [X.690]-data encoding. 2. Firewall supports FTP file filter-attachments of DOC and ZIP files in E-mails to find dangerous information to reduce the DOS (Denial of Service) attacks. 3. Attribute certificate-specify group membership, role, security clearance, other authorization information. 	Access control, secure transmissions, fault tolerance, accuracy, lower cost, improved security.

Intrusion detection systems, distributed security policy, FIPA specification learning algorithms [27].	<ol style="list-style-type: none"> 1. JXTA, WiFi OBEX -P2P communication. 2. Contact list -contains the list of neighbor nodes of P2P provider. 3. Learning algorithms-optimal configuration, improve performance. 	Scalability, autonomy, monitor heterogeneous processes and devices, expandability, fault tolerant, less overhead for communication, efficiency, reliability.
Ownership model, security policy definition language (SPDL), authentic key exchange, Diffie-Hellman key exchange protocol [8].	<ol style="list-style-type: none"> 1. Security policy of a device- same as the Resurrecting Duckling Policy Model. 2. Ownership model relations -redundancy to cope in situations where devices get lost or delegated and builds p2p security relations between devices that are trusted. 3. Remote configuration -to support limited user interface & authentic key exchange to security relations. 	Access control, authority, authentication, exception handling, limited devices, privacy, self-configuration in dynamic networks.
Symmetric encryption, public key encryption, tunnel, signature verification keys, digital signature, Search for Extraterrestrial Intelligence (SETI) [1].	<ol style="list-style-type: none"> 1. Gossip model-initial node discovery and subsequent network maintenance. 2. SETI - accountability mechanism to replicate all computation to quality control. 3. Network Address Translator- sends packet to final destination through internet. 4. Public key encryption.-secure content. 5. Groove's decentralization improves robustness. 	Fault tolerant, reliable, survivability, highly scalable, flexibility, expected latency, robustness, authenticity, confidentiality and integrity of messages, high robust anonymity and document durability.
Digital signature, security-update propagation software [34].	<ol style="list-style-type: none"> 1. Upgrades-To detect a flaw in the code and to enhance performance or extend the functionality. 2. Digital signature (encrypted by private key)-verify the originality. 	Enhanced performance, extended functionality, faster requests & responses, save time of download and install, support of multiple platforms, self immune to malicious nodes.

4. FUTURE WORK

In order to improve the QoS and security advanced P2PHBA algorithm can be used with scout bee implementation for the prediction of optimized path to efficient file sharing, better sources to selective retrieval, time efficient, robust sharing mechanism, lower control overhead, higher success ratio amidst changing mobility and high node density. The efficient content distribution with secured network are identified by trust management techniques to recognize trustworthy peers on P2P network to collect the peers trust values, authorization protocol, private key generator. Implementation of key server/origin server with IDS may improve the security of the network without affecting the performance of content distribution over the peers. Implementation of key server is to provide session keys to all nodes in the network at the configuration period for the first layer of security. At the time of routing Intrusion Detection System (IDS) is initiated for monitoring the nodes which also act as a cluster to achieve second wall of defence against intruder in the operation. TA (Trust Authority) is used to make the identification of malicious nodes in all over the network. For the dynamic routing purpose nodes outside the network coverage need to

get authenticated by IDS. Here IDS not only monitor the malicious activities it also remove or prevent those unwanted activities. So IDS is simply called as intrusion detection and prevention system (IDPS) which is primarily focused on identifying possible incidents, logging those information, reporting those attempts, identifying problems with security policies, document the existing threats and avoiding the individuals from violating security policies. While compare to other security mechanisms the implementation of IDPS will consume reasonable energy will not affect the battery life Monitoring allows one to detect, analyze and recover from detected faults and also provides additional defense against catastrophic failures. By using these double layer security and Swarm Intelligence methodologies QoS is achieved with better security

5. CONCLUSIONS

This paper conducts a theoretical analysis study on secured and QoS based content distribution in distributed computing system (peer-to-peer network). Because of the usage of a population of solutions for every iteration instead of a single solution SI algorithms can improve the performance of file

sharing network. A brief discussion of different content distribution techniques and different security implementations are summarized. Also the advantages of efficient content distribution is summarized with suggestions are given for the efficient content distribution in a secured manner.

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