A Survey on Various File Sharing Methods in P2P Networks

Vimal S * [1],   Srivatsa S K [2]

[1]*Research Scholar, Sathyabama University, Tamilnadu, Chennai, vimalshan@gmail.com*
[2]*Retired Professor, MIT, Anna University, Tamilnadu, Chennai, profsks@rediffmail.com*
*Assistant Professor, Jeppiaar Engineering College, Chennai

Abstract -- Recently, the P2P file sharing systems are more popular in the different applications. In Peer- to-Peer file sharing system, Applications are organized via different peer at dynamically. Here the communication between the peers will be taking some risk because of no previous knowledge and the experiences. The various Trust based model is also discussed in the development of Peer-to-Peer system and calculating the risks that are used for efficient P2P file sharing systems. This survey paper discovers the different file sharing methods and important concerns that communicate to peers systems and discussing about the various study actions of Peer-to-Peer file systems.

Keywords -- Trustworthiness, File sharing, BitTorrent, Structured p2p.

I. INTRODUCTION

Peer-to-Peer (P2P) overlay networks are distributed systems in nature, without any centralized control or hierarchical organization and it consists of all the participating peers as network nodes. The links between any two nodes that know each other: i.e. if a participating peer knows the location of another, then there is a directed edge from the first node to the later. Clients provide the resources in P2P networks, which may include bandwidth, storage space and computing power. The demand on the system increases when the node arrives; it increases the total capacity of the system. In contrast, clients share only their demands with the system, but not their resources in the typical client–server architecture. In this case, more clients join the system, less resource are available to serve each client. Now trust is used commonly in P2P social systems, it works implicitly in the closed social and static systems and on occasion it works explicitly in open social and dynamic systems.

II. METHODS TO SHAPING FILE SHARING IN P2P

Haiying Shen [1] it proposes the high efficiency and scalability in the Social-network-Aided efficient liVe strEaming system (SAVE). It observes the users communication channel switching or multichannel communication watching in the interactions of channels. This system used to collect the information of channel in the interactions of node interest and watching time, SAVE system forms nodes in the multiple channels with regular interactions in the overlay networks, it constructs bridges for multiple channel overlays along with fewer interactions, and enables the nodes to share the similar interests. It proposes the channel closeness based chunk, capacity based chunk provider selection and pushing strategy for enhancing the system overall performance. It increases the systems efficiency and the server load reduction.

Yipeng Zhou, Tom Z. J. Fu, and Dah Ming Chiu [2] in this paper, they point out and explain the main difference between many studies to serve user requests based on the scheduling of peers, and then it performs the different scheduling to lead the "optimal" replication methods. The proposed unique request scheduling model is used to describe the maximum no of peers that are used to serve a request. This model of scheduling is called Fair Sharing with Bounded Degree. By using this unique model is compared to various replication approaches for number of degree bounds and it observes how and why various replication methods are special depending upon the degree. The proposed system is also proposing a distributed replication algorithm and to describe this algorithm is possible to settle itself for good working of scheduling in different degrees.

Valentino Pacifici, Frank Lehrieder [3] this paper tells that there are multiple overlays challenging

to the P2P cache bandwidth then it enhance the inter-ISP traffic savings, to allocate the bandwidth between the overlays. This method formulate the trouble of P2P cache in the bandwidth allocation like in the markov decision making process and it recommends three estimations for the best policy to allocate the cache bandwidth. It proposes the policy for bandwidth allocation to arrange the group of peers with a tiny ratio of the neighborhood peers. It also improves the saving of inter- ISP traffic in the BitTorrent systems with 30% to 60%.
.

Ali Fattaholmanan, Hamid R. Rabiee [4] this work is mainly focused on the large-scale Piece-Attacks beside numerous real BitTorrent networks, and they observed that the success of attack in extends to the download time for file sharing with the targeted networks. It handles the large number of resources like the contents which is in public distribution for copy right and BitTorrent networks beside Piece-Attack. In long term periods, the Piece-Attacks are not able to calculate in the BitTorrent networks.

Andres Ferragut and Fernando Paganini [5] in this paper, they include PDE model in the evolution of population to the network for P2P file exchange. They also analyzed download of file with the interest of general distribution. It balances the stability and inconsistency of different seeders. Resource allocation is difficult in this work.

Libin Yang and Wei Lou [6] it proposes the guaranteed QoS via contract-ruled approach. This work divides the trading market in to two parts like Contract between the interested End User and the slacking Peer. To solve the multi-agents problem by using slacking Peers and the contracted peers for getting preferred output of QoS. It also solves the problem of free-riding problem.

Moritz von Hoffen, Martin Matzner and Friedrich Chasin [7] it overcomes the problem of potential peer consumers and the peer-providers for finding their needs. This current work make easy to discover good P2P SCC platforms by designing an ontology-based web directory. Three major contribution of this work is that to identify the SCC literature by using the description language, ontology is used to provide the way of describing the SCC platform domain and to design the web directory to use the ontology.

Weiming Hu, Xinmiao Ding [8] this paper discuss the color emotion and the color harmony theories to focusing the horror and violent videos. This work combines the multi-instance learning (MIL) and the sparse coding to identify horror and violent videos. The proposed work uses the context-aware multi-instance sparse coding (MI-SC) method for contextual structure. To handles the different instances, they used the joint sparse coding method for independent, contextual and the holistic perspectives.

Vitri Tundjungsari [9] it proposes the approach for exchanging of information at the emergency condition. They have used the efficient methods for information distribution and collection. It supports the best coordination and the cooperation of peer-to-peer concept. This approach focuses the reputation-based trust management of file sharing to minimizing the time wasting in the download of poor quality file.

This paper [10] focuses on the data replication to minimize the downloading time with minimal bandwidth cost. It proposes the decentralized cost effective file sharing for data replication by using the Cost-effective data Sharing system (*CoShare)* method. It allows the users for specifying the requirements of file sharing into the resource allocation. They formulated and analyzed the time and cost of data-sharing network system.

Martin Matzner, Friedrich Chasin [11] it focuses on the electric vehicles (EVs) charging infrastructure. To solve the problem of charging of EVs they have used the peer-to-peer sharing and collaborative consumption methods. It describes the approach of information technology based peer-to-peer services and research action. It uses the novel application for the sharing financial system. The main goal of this work is to go forward to find the solution of EVs and discussion of the predominantly infrastructure-creating (PIC).

This paper [12] discusses the PerformTrust – to bring the intensive trust based model for the group of peer's trustworthiness for high performance. It compares the performance of feedback history and to evaluate the current performance of the system. This work provides the virtual domain for all peers to collect the information of current peer's performance and assessing the trustworthiness. It also increases the effectiveness and benefits of file sharing.

Jianguo Chen, Xiang Xu Stefan D. Bruda [13] this peer-to-peer system assures that the process of eliminating the scalability and central susceptibility

points. It proposes the reputation based system used in the trust of data and the users. The auto-adaptive secure operating system   provides the reputation-based P2P security that automatically changes the trust level of the system.

Takashi Yajima, Hiroki Ushikubo [14] this paper assess the trustworthiness of the nodes participated in the P2P systems and finds the malicious nodes behavior by using the reputation aggregation scheme. This method collects the local scores of each transaction and finds the global scores for the reliable communication between peers. This paper also focuses the newly joining peers of reputation scores used by NPTrust

Tong Ming Lim, Angela Lee Siew Hoong [15] it proposed to improve the current P2P file sharing and broadcasting (FSMB) applications. The current FSMB applications are closed system, so that the registered nodes can only join to the P2P networks. The current work solves the problem of inefficiency of file sharing. The proposed system uses the similarity and interest based system to restrict the unwanted routing and to reduce the number of jumps. They have used the algorithm called the recall-rate learning to form the interest based cluster.

III. RESULTS AND DISCUSSION

In [1] and [4] it proposes the channel closeness based chunk, capacity based chunk provider selection and pushing strategy used for increasing overall performance of the system. It handles the large number of resources like the contents which is in public distribution for copy right and BitTorrent networks beside Piece-Attack. It increases the systems efficiency and the server load reduction.

The proposed system is also [2] proposing a distributed replication algorithm and to describe this algorithm is possible to settle itself for good working of scheduling in different degrees. The paper [3] proposes the policy for bandwidth allocation to arrange the group of peers with a tiny ratio of the neighborhood peers. In file sharing it [6] solves the problem of free-riding.
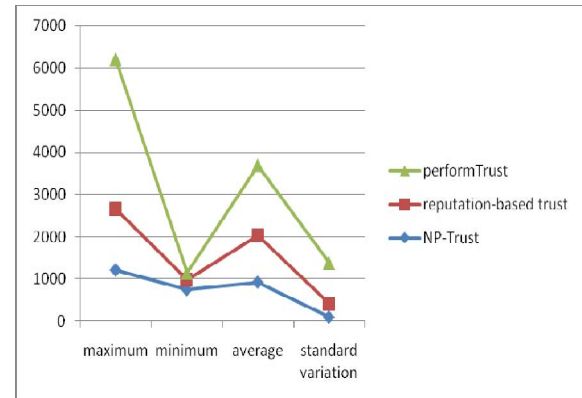

Fig 1: Comparison of different trust based model

The approach [9] and [10] to focus the reputation-based trust management [13] used to minimizing the downloading time of poor quality file and the data replication to minimize the downloading time with minimal bandwidth cost. The auto-adaptive secure operating system provides the reputation-based P2P security that automatically changes the trust level of the system. Figure1 shows the different downloading time of PerformTrust, NP Trust and Reputation-Based Trust.
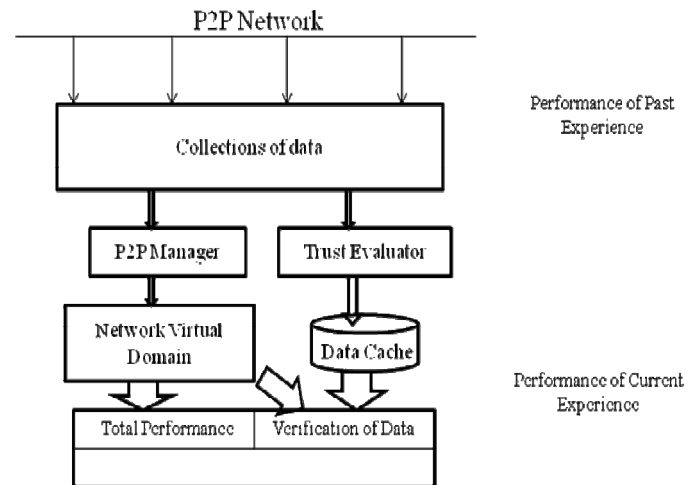

Fig 2 : Structure of Trust and Reputation Based Model

The papers [12] [14] discusses the PerformTrust –to bring the intensive trust based model (Fig 2) for the group of peer's trustworthiness for high performance. It also increases the effectiveness and benefits of file sharing. The paper [15] uses the similarity and interest based system to restrict the unwanted routing and to reduce the number of jumps. They have used the algorithm called the recall-rate learning to form the interest based cluster.

IV. COMPARISON OF EXISTING SYSTEMS

Table 1 shows the methods used advantages, disadvantages and the future scope of the various papers.

TABLE 1
Comparison of the Existing Systems

S no	Author & Year	Methods	Future Scope	Advantage	Disadvantage
1	Haiying Shen, Yuhua Lin, and Jin Li, IEEE 2015	Social-network-Aided efficient liVe strEaming system (SAVE)	Reduce the searching time.	channel switching or multichannel watching as interactions between channels	No channel-closeness-based chunk-pushing strategy
2	Yipeng Zhou, Tom Z. J. Fu, and Dah Ming Chiu 2015	Fair Sharing with Bounded Degree (FSBD)	To work well for different degrees in scheduling	we can compare the different replication strategies for different degree bounds	Computation time – high.
3	Valentino Pacifici 2016	1. Markov decision process 2. Inter-ISP traffic savings	Reduce the computation time.	The efficient bandwidth allocation	Computation time – high.
4	Ali Fattaholmanan, Hamid R. Rabiee 2015	large-scale Piece-Attacks	To measure the impact of the Piece-Attack on BitTorrent networks	Fast downloading	It does not control other attacks.
5	Andrés Ferragut and Fernando Paganini 2015	PDE models	Generalized Resource allocation	It perform transient analysis	High Complexity.
6	Libin Yang and Wei Lou, 2016	1. Contract-ruled approach 2. Mobile P2P streaming.	To solve the free-riding problem.	1. It provides stable and guaranteed QoS output 2. It controls multi-agents problem	Difficult to solve free-riding problem.
7	Moritz von Hoffen, Martin Matzner and Friedrich Chasin 2015	1. Collaborative Consumption. 2. Ontology-based web directory.	To increase the efficiency in file sharing.	1. Individuals can share their resources 2. It tells the Effective discovery of P2P SCC platforms	High complexity
8	Weiming Hu, Xinmiao Ding, Bing Li, 2016	1. Cost-sensitive context-aware method 2. Multi-perspective multi-instance joint sparse coding method.	To recognize all the types of file.	Effective for violent and horror video file recognition	Computation time – high.

9	Vitri Tundjungsari, 2015	Reputation-based trust management	Reduce computational complexity.	1. Information exchange in the emergency situation 2. Fast delivery. 3. High Throughput	Implementation is complex.
10	Hao Zhuang, Imen Filali,2015	Cost-effective data Sharing system (CoShare)	To increase the data transfer rate.	1. Effective data transfer. 2. It reduces the bandwidth cost	Multiple replications of data.
11	Martin Matzner, Friedrich Chasin, 2016	IT-based P2P SCC services	Develop a system with minimum cost.	1. Speed-high. 2. It finds the solution for electric vehicles. 3. Good infrastructure creating	Not focused on the other methods.
12	Jianming Fu Huijun Xiong, 2008	PerformTrust model	Develop a system for similarity trust.	1. It provides secure and high quality interactions in P2P. 2. Increasing effectiveness and benefit.	Cost Complexity – high.
13	Jianguo Chen, Xiang Xu, 2010	Reputation-based P2P security	Develop a P2P system with minimum cost.	1. Trustworthiness of users and shared files 2. To increase the trust levels of the user and the data	Cost Complexity – high.
14	Takashi Yajima, Hiroki Ushikubo, 2012	1. Reputation aggregation method 2. GossipTrust and DFR-Trust.	Reduce computational complexity.	1. High reliability. 2. Decreasing the file request time.	Not focused on file replication.
15	Tong Ming Lim, Angela Lee Siew Hoong, 2014	1. Recall-rate learning algorithm 2. Similarity interest	To reduce the congestion	It reduces the amount of query	Heavy congestion is occurred

V. CONCLUSION

Thus the comprehensive appears of performance of file sharing methods in the P2P systems are discussed with the help of the variety of existing systems. The performance and the cost complexity of these file sharing and searching methods are seen effectively. From the comprehensive study of existing systems, it is very much clear that, for developing an efficient file sharing method in P2P systems, also the Reputation-based P2P systems are used to avoid the existing system drawbacks. The Trustworthiness of users is increased in the P2P overlay networks.

REFERENCES

[1] A Social-Network-Aided Efficient Peer-to-Peer Live Streaming System Haiying Shen, Senior Member, IEEE, Member, ACM, Yuhua Lin, and Jin Li, Fellow, IEEE/ACM TRANSACTIONS ON NETWORKING, VOL. 23, NO. 3, JUNE 2015

[2] A Unifying Model and Analysis of P2P VoD Replication and Scheduling Yipeng Zhou, Tom Z. J. Fu, and Dah Ming Chiu, Fellow, IEEE/ACM TRANSACTIONS ON NETWORKING, VOL. 23, NO. 4, AUGUST 2015

[3] Cache Bandwidth Allocation for P2P File-Sharing Systems to Minimize Inter-ISP Traffic Valentino Pacifici, Frank Lehrieder, and György Dán IEEE/ACM TRANSACTIONS ON NETWORKING, VOL. 24, NO. 1, FEBRUARY 2016

[4] A Large-scale Active Measurement Study on the Effectiveness of Piece-Attack on BitTorrent Networks Ali Fattaholmanan, Hamid R. Rabiee, Senior Member, IEEE TRANSACTION ON DEPENDABLE AND SECURE COMPUTING 2015 IEEE

[5] Fluid Models of Population and Download Progress in P2P Networks Andrés Ferragut and Fernando Paganini, *Fellow, IEEE*

[6] A Contract-Ruled Economic Model for QoS Guarantee in Mobile Peer-to-Peer Streaming Services Libin Yang and Wei Lou, Member, IEEE TRANSACTIONS ON MOBILE COMPUTING, VOL. 15, NO. 5, MAY 2016

[7] Designing an Ontology-based Web Directory for the Discoveryof Sharing and Collaborative Consumption Platforms Moritz von Hoffen, Martin Matzner and Friedrich Chasin 2015 IEEE 17th Conference on Business Informatics

[8] Multi-Perspective Cost-Sensitive Context-Aware Multi-InstanceSparse Coding and Its Application to Sensitive VideoRecognition Weiming Hu, Xinmiao Ding, Bing Li, Jianchao Wang, Yan Gao, Fangshi Wang, and Stephen Maybank IEEE TRANSACTIONS ON MULTIMEDIA, VOL. 18, NO. 1, JANUARY 2016

[9] Supporting Collaborative Emergency Response System with Reputation-based Trust Peer-to-Peer File Sharing Vitri Tundjungsari Heri Yugaswara 2015 International Conference on Technology, Informatics, Management, Engineering & Environment (TIME-E)Samosir Island, North Sumatra, Indonesia, September 7-9, IEEE 2015

[10] CoShare: A Cost-effective Data Sharing System for Data Center Networks Hao Zhuang, Imen Filali, Rameez Rahman, Karl Aberer 2015 IEEE Conference on Collaboration and Internet Computing

[11] Designing a Peer-to-Peer Sharing Service as Fuel for the Development of the Electric Vehicle Charging Infrastructure Martin Matzner, Friedrich Chasin, Moritz von Hoffen, Florian Plenter, and J̈org Becker 49th Hawaii International Conference on System Sciences 2016 IEEE

[12] PerformTrust: Trust Model Integrated Past and Current Performance in P2P File Sharing Systems Jianming Fu Huijun Xiong Zhou Li Huanguo Zhang 2008 IEEE

[13] Combining Data Trust in Reputation Systems to Boost P2P Security Jianguo Chen, Xiang Xu Stefan D. Bruda 2010 IEEE

[14] Reputation Aggregation Method Considering Reliability of Newly Joining Peers in Unstructured P2P Networks Takashi Yajima, Hiroki Ushikubo, Hiroshi Shigeno 2012 Seventh International Conference on Broadband, Wireless Computing, Communication and Applications 2012 IEEE

[15] The 6-hop Peer-to-Peer System Tong Ming Lim, Angela Lee Siew Hoong Teck Min Chin 2014 IEEE

Srivatsa S K Retired Professor, MIT,Anna University, Chennai. He published more than hundred and twenty National and International journals and Conferences. He also Guided many Research Scholar.

Vimal S received his B.E degree in Computer Science and Engineering from Anna University and the M.Tech Degree in Information Technology from Sathyabama University Chennai. He is currently a Ph.D. student in the Department of Computer Science and Engineering at Sathyabama University, Chennai.