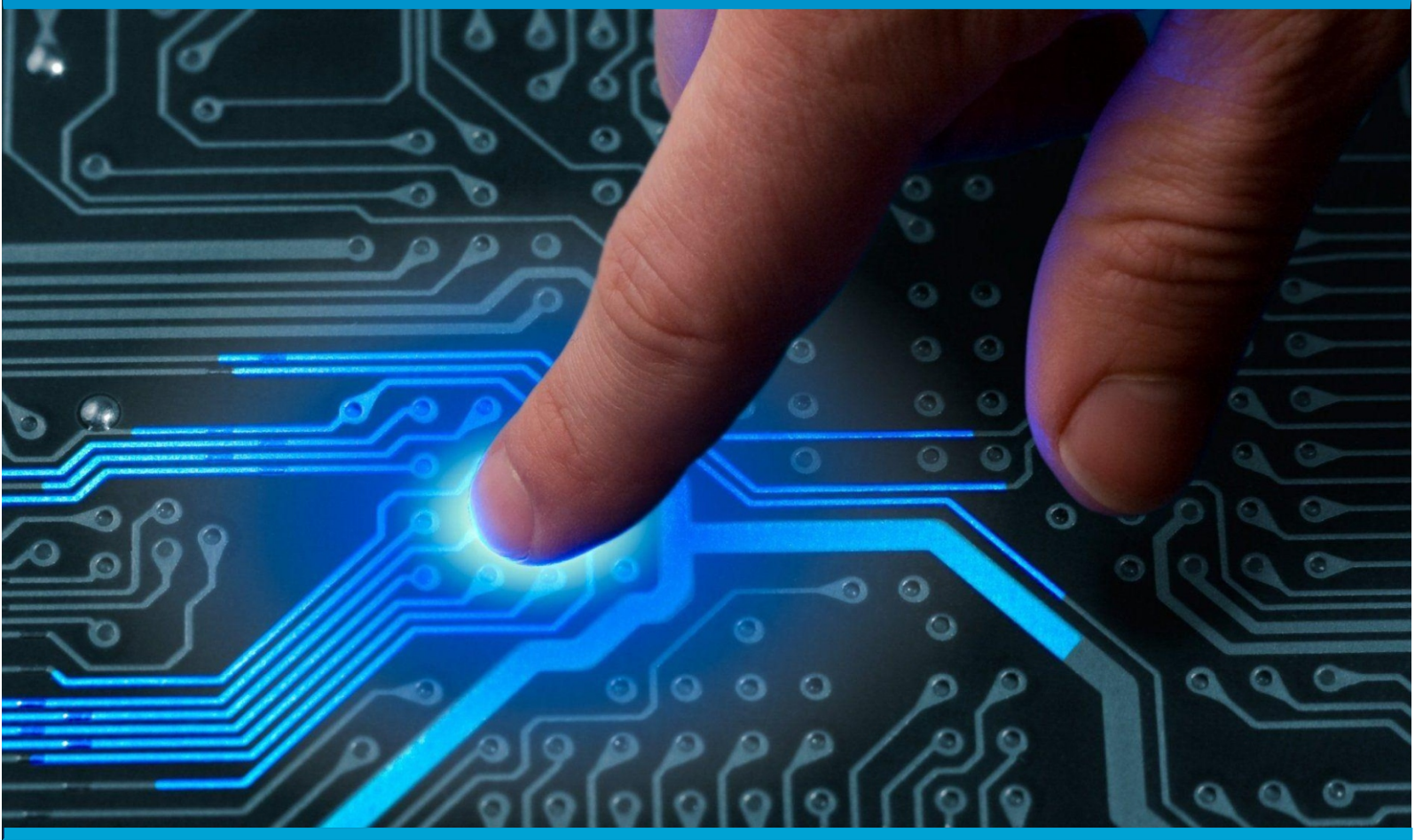
IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

## IN COMPUTER & COMMUNICATION ENGINEERING

Volume 8, Issue 9, September 2020

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.488

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | Impact Factor: 7.488 |

|| Volume 8, Issue 9, September 2020 ||

# Review on Peer-to-Peer Architecture for Heterogeneous Social Networks

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**ABSTRACT**: Social Networking Sites (SNS) have become part of our everyday lives nowadays. On these pages, we share a lot of info. They have helped us to make the planet smaller and more interconnected. Today, there are many SNSs available and many more are funded every day. Thus, each day a user uses several SNS and connects, exchanges information with friends and family. If a user really likes the SNS he uses more or he wants another SNS than he uses more, this communication medium gives rise to a complex structure. As a result, for different social network applications, a user can register with multiple SNSs, carry multiple SNS accounts, interact with contacts from different SNSs, publish and access various web content, and share content within each SNS group. Although SNSs offer various services, one main feature shared among SNSs is how they are built around the existing social networks of users and users. Yet, each SNS is isolated, so users manage their profiles on various SNSs and create relationships separately. In different SNSs, the content for the same user can overlap, so it becomes a burden for users to manage content across various SNSs. This gave rise to the need to incorporate all the SNS a user uses together and help the user understand and share the lists of data and friends and many other items offered by the SNSs together and help the system analyse the need for the user and assist him in any situation, such as online and offline, to use the SNS effectively. The aims of this survey are three-fold. First, the survey discusses the characteristics of online social networks focused on P2P and describes the criteria for such (zero-trust) sites. Secondly, it elaborates on the building blocks for P2P frameworks that allow the creation of such sophisticated and demanding applications, such as user/identity management, reliable data storage, secure communication, access control and general-purpose extensibility, features that are not addressed in other P2P surveys. As a third point, it gives an overview of proposed P2P-based online social network applications, frameworks and architectures. In specific, it explores the technical details, inter-dependencies and maturity of the available solutions.

**KEYWORDS**: Social Network, P2P(Peer to Peer), SNS, Social Sites etc.

## I. INTRODUCTION

Over the last few years, social networking has experienced unparalleled growth as a medium of online interaction, with a significant increase in the number of users over the last 10 years, as seen in Table II. The increasing number of users of the various online social network (OSN) users, in which virtually every age group is effectively represented, has realised this growth.

Many studies on the current common OSNs, such as [1]-[5], have revealed many issues that need to be carefully considered and addressed. These challenges include, but are not limited to, the smooth scaling of the network without straining the resources available (both monetary and physical) and the ability of users to monitor their data when using social networks and to protect their privacy. While the suppliers have mastered the first problem, technological viability, the question of privacy and trust has not yet been solved. Let us consider the model of centralised service provision currently used in Table II by the OSN platforms mentioned. Here, the platform is hosted by a single operator, ensuring its availability and using its access to all data stored by "customers" to provide social networking services. The data comprises profile data, traces of contact, all uploaded and downloaded material and all traces of interaction.

While the user of the site normally only tries to communicate with his friends or supporters, in private or as a group and often in public, without seeing and knowing the provider, he has no chance of using the service. Therefore, as users do not have sovereignty over their data, faith in the provider is required. In addition to looking for attractive offerings for customers, the provider, on the other hand, also has a high interest in monetizing user data. A frustrating cumbersomeness is having to accept (personalised) ads, however more misuse occurs. Facebook and Cambridge-Analytical Scandal1 are examples of such misuse. Other issues are also posed by misuse, such as government

monitoring of privacy infringements, such as the Chinese Social Credit System [6], [7], location tracking2 [8], social media data mining for terrorist sentiments [9], [10] which can, among other consequences, infringe freedom of expression. A social networking platform is built to put people together and get them to stay connected. The SNSs of today only support homogeneous SNSs in which users are unable to connect with other users of the SNSs and are unable to establish relationships globally. There is a need for heterogeneous SNSs along with homogeneous SNSs to overcome this problem. The framework enables various SNSs to interconnect with different networks in the proposed system by defining "national relationships" between registered users over heterogeneous SNSs. Integrated heterogeneous SNSs provide different services of different SNSs over a single platform and establishes path between two users with less time.

## II. LITERATURE SURVEY

[1] Phone lin and Piachun chang,"P2P: A peer to peer Architecture for heterogeneous social networks," IEEE Network, January/February 2014. A peer-to-peer network architecture to integrate multiple SNSs without incurring excessive overhead to the SNSs. With integrated model, we could develop an effective approach, a Global Relationship Model, to evaluate the global relationship strength between two users with more precision. Thei-Search mechanism to find the social path with certain level of social relationship strength in a P2P social network.

**[**2] C. Zhang eta.,"Privacy and Security for Online Social Networks: Challenges and Opportunities**,"** IEEE Network, vol. 24, no. 4, July/Aug. 2010, pp. 13–18. The security and privacy design issues on online social networks and pointed out a few research directions for mitigating the design conflicts between the various design goals of OSNs. However, an ultimate solution will require experts from the social science and network security communities, industry, regulatory bodies, and all other relevant communities to collaboratively make decisions on both secure mechanisms and policies. This article is intended to provide a starting point for developing effective secure and privacy-preserving OSNs. We hope that this work will motivate OSN researchers and developers to move forward with more creative design of OSNs without compromising users' data security and privacy. [3]

[3]A. Misloveetal. "Measurement and Analysis of Online Social Networks," Proc. 7th ACM SIGCOMM Conf. Internet Measurement, 2007, pp. 29–42. An analysis of the structural properties of online social networks using data sets collected from four popular sites. Our data shows that social networks are structurally different from previously studied networks, in particular the Web. Social networks have a much higher fraction of symmetric links and also exhibit much higher levels of local clustering. We have outlined how these properties may affect algorithms and applications designed for social networks. Establishing the structure and dynamics of the content graph is an open problem, the solution to which will enable us to understand how content is introduced in these systems, how data gains popularity, how users interact with popular versus personal data, and so on.

[4] H.-L. Fu et al., "Energy-Efficient Reporting Mechanisms for Multi-Type Real-time Monitoring in Machine-to-Machine Communications Networks**,**, " Proc. IEEE INFOCOM 2012 Conf., Mar. 2012, pp. 136–44. Many third-party sites have adopted social networks connect services to extend their presence in the Social Web. Integrating these third-party sites with SNCSs creates a more feature-rich online social community and promises to break down the garden walls of social-networking sites. However, many challenges come with this growth, and the social-networking community must collaborate to design and deploy secure services that both protect privacy and deliver a satisfactory user experience.

## III. **BACKGROUND**

***Social Network Classification****s*

Various proposals have been put forward for the classification of SNs as shown in Fig. 1 and discussed herein.

*1)* ***The scope model****:* The scope model [11] considers the core activities of the SN which are grouped into two categories. The first category, *entertainment* (or *private* [2]), focuses on the delivery of fun and interactive social experience to registered users, for example, Facebook, Flickr, MySpace and Hi5. The second category is *business*, which focuses on connecting professionals for purposes of productivity and success, for example, LinkedIn and Xing.

*2)* ***The data model****:* The data model [11] (or *programming paradigm model* [12]), classifies the SNs as centralized or decentralized.

In the *centralized model*, the storage of data is in a single administrative domain. It is further divided into *integrated clientserver*and *decoupled client-server*. In the integrated client-server model, application developers utilize their own servers to manage and store social relationships and also provide required resources supporting content sharing. On the other hand, for the decoupled client-server model, users have the capability to manage their own social relationships but only core social services and social relationships which are linked to their accounts are updated centrally. For the *decentralized model*, data is distributed across multiple administrative domains, and it has two sub-categories: *decentralized federated* and *peer-to-peer*. The decentralized federated model offers no centralized infrastructure from

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | Impact Factor: 7.488 |

|| Volume 8, Issue 9, September 2020 ||

the application developers but there is reliance on existing decentralized and federated messaging system, such as Extensible Messaging and Presence Protocol (XMPP). Thus users choose the service provider of their choice so long as they are part of the same federation. The peer-to-peer model is fully decentralized and users directly connect to their trusted friends and share content.Developers either write their own P2P protocol or rely on existing P2P technologies.

*3)* ***The system model****:* This view of SNs looks at the application servers in terms of the hosting and content distribution. Pallis et al. [11] give two categories under this dimension. The first is the *web-based scheme* in which application servers are hosted by Web sites providing required set of services as well as APIs and most of the services are usually free to users. The second category is *cloud based schemes* in which the application servers are hosted by a utility company that provides the necessary infrastructure, and the servers accessed by the SN provider are virtual.

*4)* ***The network model:***Finally, in the network model [11], the manner in which the users' network is formed is taken into consideration. In this regard then, there are two further subgroups within this model: *user-oriented* and *content-oriented*. User-oriented SNs (also called profile-based SNs) emphasizes the social relationships that are in existence and content sharing occurs between users in the same community. Examples of SNs in this category include Facebook, MySpace and LinkedIn.The content-oriented SNs (also called content-based SNs) emphasize the common interests that may exist between users rather than the social relationships. Examples in this category include YouTube.

## IV. TYPES OF P2P NETWORKS

### A. PURE P2P NETWORKS

It responds that there is no dedicated server, all nodes behave equally, and all nodes work equally. It means that in the logic that each node or peer functions as both a client and a server, all the participating peers or nodes in a pure P2P network are equivalent. A central server does not exist. Gnutella and Freenet are examples of pure P2P networks. It is possible to analyse the pure P2P network principle in the Freenet architecture.

### B. HYBRID P2P NETWORKS

It performs as a client-server prototype as it has a chief node or peer that performs on behalf of that knowledge as a server that maintains node statistics and responds to requests. The chief server (node or peer) understands what communal possessions are and what is allowed. They are also responsible for accommodating the properties provided. Napster is an example of a hybrid P2P network. There is a server in Napster that lets nodes search for a particular file and initiate direct client contact. The server contains only the files in its catalogue that are open. Bit Torrent (BT) is another example of this possibility. There is a central server called tracker in BT that coordinates the interaction between the nodes to download a file accessing BT. in the Napster architecture, the hybrid paradigm can be analysed.

### C. MIXED P2P

It has both pure and hybrid properties. The primary and fundamental distinction between hybrid and pure P2P networks is that there is a central agent in hybrid P2P networks and no server in pure P2P networks. The pure P2P design, compared to the hybrid P2P architecture, is simple with a higher degree of fault tolerance. Furthermore, less network resources are used in a hybrid P2P design. In contrast to a pure P2P network, it is much more flexible.

### PEER TO PEER NETWORK APPLICATIONS:-

Since the apparition of P2P network, applications are in a continuously grow, from file sharing to real time applications.

**File Sharing:** content storage and exchange is one of the areas where P2P technology has been most successful. File sharing applications focus on storing and retrieving information from various peers in the network. One of the best known examples of such P2P systems is Emule, KaZAa.

**Distributed Computing:** these applications use resources from a member of network computers. The general idea behind these applications is that idle cycles from any computer connected to the network can be used for solving the problem of the other computers that require extra computation. SETI@homeis one example of such systems.

**Communication and Collaboration:** collaborative P2P applications aim to allow application level collaboration between users. These applications range from instant messaging and chat, to online games, to shared applications that can be used in business, education and home environments. Grooveand Jabberare two examples of such systems.

## V. ANALYSIS AND DISCUSSION

P2P networks are regarded as software for file sharing. However, as mentioned above, it has many types of applications. A P2P framework has emerged for each C / S framework. P2P networking is not limited to creativity, but also includes social structures with a peer-to - peer dynamic. Social P2P mechanisms are currently evolving in society in such a sense.

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|| Volume 8, Issue 9, September 2020 ||

## VI. CONCLUSION

This paper introduces a peer-to - peer social network architecture that makes social computing services in distributed environments simpler. This social network aims to provide users with information. The social network uses a super peer-to - peer architecture comprising peer and super peer architectures. To participate in the network and programmes, users use peers. We have expanded the Gnutella protocol to include authentication and posting services on the social network for peers with adequate storage, bandwidth and processing power to become super peers that support peers for complex operations such as user authentication or community communication. The architecture of these services copes with the social network's distributed environment. On a number of laboratory workstations, the assessment of the prototyping social network has been carried out to analyse its scalability, usability and efficiency.

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