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Device to Device Resource Dissemination by Social Network

A. Samydurai[1], Niveda Karunakaran[2], K. R. Raghul Priya[3], S. Sujitha[4]
[1, 2, 3, 4]Department of Computer Science and Engineering, Valliammai Engineering College, SRM Nagar, Kattankulathu-603203
Email address: [1]samyduraia.cse@valliammai.co.in

Abstract**—** *In the present day scenario, Device to Device (D2D) communication happens to be a major technology in overcoming the wireless capacity crunch and in developing new application services. In this paper, the proposed system supports social interaction by recommending and accepting new friends. Offloading data is one of the promising solutions to overcome the problem as it is cheaper in comparison. Two or more can connect with each other through Nearest Neighbor Search (NNS) algorithm. The data distributed over two devices will be privacy preserved. Less data usage is ensured through image compression. The peer to peer communication is happening in the back end, hence ensuring the security*.

Keywords**—** *Content delivery networks, online social network, nearest neighbor search, D2D, dissemination*.

I. INTRODUCTION

The recently increasing usage of smart phones, tablets and several wireless network have increased the usage of You Tube, Face book and other such social networking medium to a higher level [10], [5].This paper majorly has focused on the formation of the social network of the mobile users variably having a huge impact on the improvement of the performance of a variety of applications. Distribution of dynamic content through social network has also been taken into account. In this application, users are notified of the recently updated contents such as videos, images and other such media files. The files that are available to be shared are lined up in an opportunistic fashion that is the content which is the latest is given the first priority so as to increase the number of users that receive fresh information [1].The internet traffic created by online multimedia streaming providers has amounted to a variably large amount. These providers mainly rely on Content Delivery Networks (CDNs) in order to distribute the contents from the servers to wide range of locations around the globe thereby maximizing the overall efficiency. A recent problem is that the contents shared on the Online Social Network (OSN) might often lead to a flood of requests as these networks drive a large part of the daily requests to the content providers. Henceforth, we duly rely on this distinctive concept of social cascades is likely to spread on geographically local distances [9].

Due to the ever increasing usage of smart phones, mobile operating systems and online social networking services, Mobile Social Networks (MoSoNets) have started to gain popularity among the present day youth. Such a development in MoSoNets is mainly due to increase in usage of online social networking sites by working of software applications through mobile. A huge amount of mobile data traffic is occurred with 3G cellular overloading as a side effect. In order to attend to this critical problem, it is advised to develop new architectures and protocols. It is pretty evident that usage of WLAN hotspots may yield less coverage and user may find it difficult to connect through them [5].

In this paper, the communication is said to be carried out between users in the same geographical location. We proposed an online/offline social networking application which utilizes the P2P communication, when the requested content is available with neighborhood by leveraging the locations of all users and establishes a secure data connection using Bluetooth for local access. OSN users can post their text, image and video to public or friends. If user needs to view the post, it should be downloaded from OSN server or receiver from the nearby device if available. Server continuously maintains all user download history and current GPS of all OSN users. If a request arises to the server, it looks up for the nearby device and if available it searches for the user requested content. If the content is available server triggers the both the neighboring devices and initiate a peer to peer mode of communication. Here we use Bluetooth as P2P communication and the requested content will be delivered to the destination device in offline mode. According to the recent studies, the primary reason for cellular traffic is due to the download of popular media content or such applications. So, offloading it to the D2D tier has a major hand in the reduction of cellular network load. This paper mainly focuses on the ways to exploit the social network characteristics on the road of improving packet transmission and network load [10].

II. RELATED WORKS

In this paper, the author has proposed an idea of dynamic-content distribution Service. It is based on how the service provider allocates its bandwidth in order to make the content at the users more refreshing [1]. The author has proposed a technique to work on privacy issues in content-based opportunistic networks. For that matter he has defined three privacy modules and also defines the security primitive requirements [2]. In this paper, the author puts forth an idea of how people's social interaction be exploited. In order to improve the system's performance and query hit rate, a trace driven simulator has been enabled. This simulator mainly deals with three varied mobile systems: DTN routing protocols, firewalls preventing a worm infection, and a mobile P2P file-sharing system. In this paper, the author has considered Device-to-Device (D2D) communication underlying cellular networks to improve local services. This system's aim is to optimize the throughput over shared

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resources. The Device to Device connections share the same resource through different resource sharing mode [4]. In this paper we reduce the bandwidth and transfer the content faster by using publicly available trace in OSN. This OSN distribution and processing can be significantly improving performance without loss in service consistency [6]. In this paper, the device to device communication is occurred through social network layer and physical wireless network layer [10].

In this paper, the author proposed the technique of how mobile systems be used in exploiting social interaction thereby improving their performance and query hit rate. A trace-driven simulator has been built in order to recreate the behaviour of mobile systems in a social environment [3]. In this paper, the author puts forth an idea to exploit opportunistic communications to make information dissemination possible in Mobile Social Networks (MoSoNets) and thereby reducing the amount of mobile data traffic. The author proposed three algorithms namely greedy, heuristic and Random in order to evaluate the performance of the problem through an extensive trace-driven simulation study [5]. The author proposed a technique to explore the usage of self-reported social networks when compared to the detected social networks found through encounters. These encounter records carrying sensor motes are used to generate the detected social networks. These networks are used for routing [7]. In this paper, the author investigated how geographic information has played a part in improving caching multimedia files in a content delivery network acquired from social cascades [9]. In this paper, the author proposed a technique of designing a system for predicting links for social networks. A distinctive supervised learning framework was made to exploit the new link among friends [11].

In this paper, the author proposed a technique to distribute the content to a set of subscribers through mobile network. The content is shared through Wi-Fi ad-hoc mode. A theoretical model has been set up to analyze how the content can be distributed via mobile networks and sharing via Wi-Fi links [8]. The OSN web application is built as social networking application in which new user can register for the services. Figure 1 shows, the registration fields are validated user is able to login with his credentials.

III. System Architecture

The users can set Cover picture, Profile photos and can add friends. The friend request will be dispatched to end user account and will be readily available once he logged in. He can accept/reject the friend request. The friend list is shown in the right panel and can be able to chat with the recipient private manner. The users can post some News, Images and Video and some other information. These posts can be shared with friends with access control. The shared posts can be viewed by friends if they have proper access control once they login. Friends can reply to the posts with some comments and like/dislike the posts.

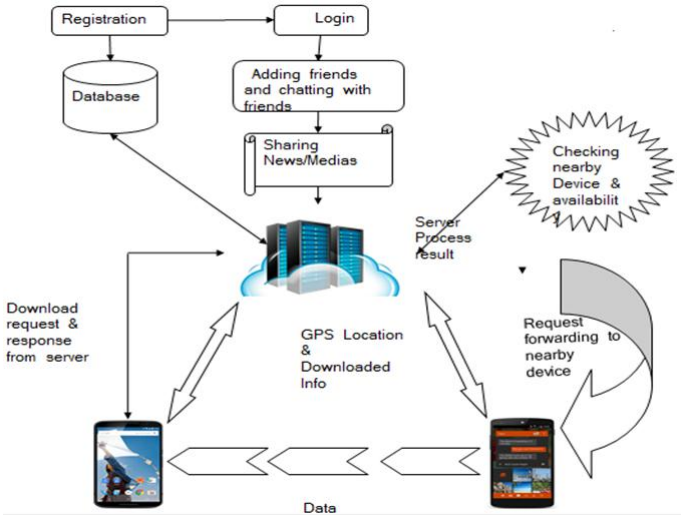

Fig. 1. GPS based resource sharing model

Users first need to install the OSN app in their Android phone and user need to login with their valid account. After login server can able to maintain their GPS position of the user and Bluetooth MAC address and IMEI. The Server keeps track of all the users gps coordinates and the downloaded file contents if a download request rises from the user. A service thread will be run in android application which regularly updates the GPS coordinates to the server if any change occurs. The GPS position is intimated only if there a change notified which reduces the communication overhead between the client and server. The server will be in a push mode whenever a post is triggered to the android mobile device. Our Image compression technique enables the user to view compressed image without blur and reduce the data usage. All the post can be viewed in android and web application.

If any of the user need to view the post e.g.: (Video/Image) the request is sent OSN Server which will look up for the nearby devices. If there is one or more devices in close proximity, the vserver will check for the historical download requests of each nearby user for content. If the content is available with any of the user, server triggers both the nearby devices (Content requester, Content dispatcher) in back end Service Thread that already running in the mobile devices to initiate a Bluetooth communication. Here we handled both paired as well as unpaired devices and this is through pre sharing of Bluetooth ids by server to neighboring devices. After successful Bluetooth initialization the contents will be transferred from source mobile to destination mobile. The privacy of the entire user is retained by having pseudo identities for all the communications. The users are not aware of peer to peer communication that is happening in the back end, hence ensuring the security.

IV. Nearest Neighbour Search Algorithm

Nearest neighbor search (NNS), also known as proximity search, similarity search and closest point search. It is difficult to find the nearest points. A dissimilarity function is used to express closeness. There would be larger function values for less similar objects. Take entropy system for an instance. In

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this system, the nearest neighbor for all the data points is formulated with the N data-points present. Henceforth, nearest neighboring search algorithm must be run every time thereby resulting in redundancy. To overcome this, a novel algorithm has been proposed thereby exploiting information redundancy for an effective search. To be simpler, let us consider this example. If one needs to find a distance from point X to point Y, the distance from point X to point Y can also be devised thereby acquiring same answer for two unique queries. In the nearest neighboring search algorithm, O(n log n) time is taken to find the n points in the system and it takes O(mn log n) time to find the m nearest neighbors.

V. Experimental Results

There are two types of NNS algorithm they are main memory algorithm and secondary storage algorithm. Main memory algorithms of NNS are quad tree, k-d tree, locality sensitive hashing. Secondary storage algorithm: R-tree, VA-file. Quad tree is simplest spatial structure on Earth. Quad tree splits the space into 2^d sub squares. Only one dimension is split at a time. K-d-trees are Top – down approach. It does only one dimensional split and instead of a middle split. Hence, that split must be chosen carefully. Locality Sensitive Hashing returns the closest point through a hashing function. It works best for Hamming distance. It requires radius r to be found in advance. It seeks time which is similar to the transferring of hundred such KBs. In such a case, data grouping becomes crucial. R-tree is "Bottom-up" approach. It find minimum rectangle containing objects. In VA-file, if we need to visit so many nodes anyway, it is better to scan the whole data set and avoid performing seeks altogether.

VI. Conclusion

In this paper, a novel approach has been used to enhance socio-aware approach for optimizing D2D communication reducing the Bandwidth usage, Network traffic and Server load, improving the data utility by neighborhood sharing and by also maintaining security and privacy concerns. The popular contents, such as certain You Tube video, are requested much more frequently than others. As a result, the BSs often end up serving different mobile users with the same contents using multiple duplicate transmissions. In this case, following the BS's first transmission of the popular content, such content is now locally accessible to other users in the same area. Hence peer to peer mode of communication will be better for disseminating the duplicate contents. In peer to peer, each and every node acts as the server as well as the client. Peer to peer mode of communication is light weighted, battery efficient and traffic free. Bluetooth is one of the most familiar peer to peer technologies ever used. Bluetooth uses agreed frequencies that can be used anywhere and anytime.

Reference

[1] S. Ioannidis, A. Chaintreau, and L. Massoulie, "Optimal and scalable distribution of content updates over a mobile social network," *in Proceedings of INFOCOM*, pp. 1422-1430, 2009.

[2] A. Shikfa, M. Onen, and R. Molva, "Privacy in content-based opportunistic networks," *International Conference on Advanced Information Networking and Applications Workshops*, 2009.

[3] G. Miklas, K. K. Gollu, K. K. W. Chan, S. Saroiu, P. K. Gummadi, and E. de Lara, "Exploiting social interactions in mobile systems," *Proceedings of the 9th international conference on Ubiquitous computing*, pp. 409-428, 2007.

[4] H. Yu, K. Doppler, C. B. Ribeiro, and O. Tirkkonen, "Resource sharing optimization for device-to-device communication underlaying cellular networks," *IEEE Transactions on Wireless Communications*, vol. 10, no. 8, pp. 2752–2763, 2011.

[5] B. Han, P. Hui, V. S. A. Kumar, M. V. Marathe, J. Shao, A. Srinivasan, "Mobile data offloading through opportunistic communications and social participation," *IEEE Transactions on Mobile Computing*, vol. 11, no. 5, pp. 821–834, May 2012

[6] M. P. Wittie, V. Pejovic, L. Deek, K. C. Almeroth, and B. Y. Zhao, "Exploiting locality of interest in online social networks," in *Proceedings of the 6th International Conference CoNEXT*, Philadelphia, PA, USA, Article no. 25, 2010

[7] G. Bigwood, D. Rehunathan, M. Bateman, T. Henderson, and S. Bhatti, "Exploiting self-reported social networks for routing in ubiquitous computing environments," in *IEEE International Conference on Wireless and Mobile Computing, Networking and Communications*, Avignon, France, pp. 484–489, 2008.

[8] X. Wang, M. Chen, Z. Han, T. Kwon, and Y. Choi, "Content dissemination by pushing and sharing in mobile cellular networks: An analytical study," in *IEEE 9th International Conference on Mobile Ad-Hoc and Sensor Systems (MASS) MASS*, Las Vegas, NV, USA, pp. 353–361, 2012.

[9] S. Scellato, C. Mascolo, M. Musolesi, and J. Crowcroft, "Track globally, deliver locally: improving content delivery networks by tracking geographic social cascades," in *Proceedings of the 20th International Conference on World Wide Web*, Hyderabad, India, pp. 457–466, 2011.

[10] Y. Zhang, E. Pan, L. Song, W. Saad, Z. Dawy, and Z. Han, "Social network aware device to device communication in wireless network," *IEEE Transaction on Wireless Communications*, vol. 14, no. 1, 2015.

[11] S. Scellato, A. Noulas, and C. Mascolo, "Exploiting place features in link predictions on location-based social networks," *Proceedings of the 17th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, pp. 1046-1054, 2011.

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