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RESEARCH ARTICLE

PEER TO PEER FILE SHARING PROTOCOLS, METHODS OVER MANET: SURVEY.

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Abstract

In today's world p2p network is widely used and getting more famous application in the MANET and p2p file sharing application is mainly concentrated in the MANET and having very important status in MANET. File sharing for Ad hoc network demands to build the search algorithm for transporting our request and finding Result and also it requires the transfer protocol for downloading the requested file. Also MANET causes many challenges related to robustness and scalability in a p2p system. In file transfer methods searching techniques got noticed more. This paper represents the detail study and examination of some few years ago, researches about file transfer protocols, algorithms and methods and also challenging some issues about p2p file transfer protocol in MANET.

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Introduction:-

Peer to peer and MANET file sharing application have gained more and more attraction in recent year. A MANET is an infrastructureless IP oriented network of mobile device system linked with radio. The systems present into a MANET do not have a any type of base station mechanism. Or in other words a mobile ad hoc network is a kind of ad hoc (for a particular purpose) network that transfers from one system to another system rather than using a centralized access that communicate whole systems to each other. MANET is a continuously self-configuring network. Every computer or device is a router as well as end host and having limited energy and computing resources.

Nowadays the number of smart phone users is rapidly increasing with the development in the field of wireless communication technology. Now mobile users want to access applications and data wherever and whenever they want through mobile. Also, users would like to store useful information, search content from the internet and share content with their friends on the handheld computer platform. MANET consists the devices that are adequate with wireless technologies like WiFi and Bluetooth which are very efficient and most significant supplement to the application among mobile users and it gives new application scenario to mobile ad hoc network. In a college campus or conference, people can share their important and interesting files. And all that work requires the file sharing application people can do. Because of this peer to peer file sharing in mobile ad hoc network attracts more researcher's attention.

Working Of Manets:-

A MANET is built up by a group of MANET routers also called as Mrs. These MRs create and preserve a routing network between them on dynamic radio interfaces. Any Internet Protocol router, an MR have a group of linked

systems. These systems use the MANET through the MR to who are connected to each other. Due, in part, to the mobility of MR and, in part, to environmental issues (especially wireless characteristics), the network topology and communication links in an ad hoc network modify case periodically than in fixed wired or wireless structures. These aspects and Internet Protocol (IP) construct for ad hoc network. MANET routing techniques are classified into three important cases, i.e. proactive technique, reactive technique and hybrid technique.

Proactive:-

In proactive routing, every system has to preserve one or more than one tables to store path data, and every modification in network structure requires to be updates the information entire network in reply to sustain a constant structure of network. Example of such design are the conventional routing designs: Destination sequenced distance vector (DSDV).

Reactive Protocols:-

Reactive routing has another name and known as one requiring a routing method, hence they preserve routing data or routing action in the network system when they have done any kind of communication between network systems. When the system requires to dispatch the data to another system then this method find out the path on requirement manner and build the path and connection for delivering and receiving the data. (AODV) and (DSR) are two examples.

Hybrid Protocols:-

They proposed a hybrid design that merges reactive and proactive routing techniques. The Zone Routing Protocol is a type of this technique which distributes the structure into zones. ZRP gives a hierarchical structure that provides additional memory to preserve data.

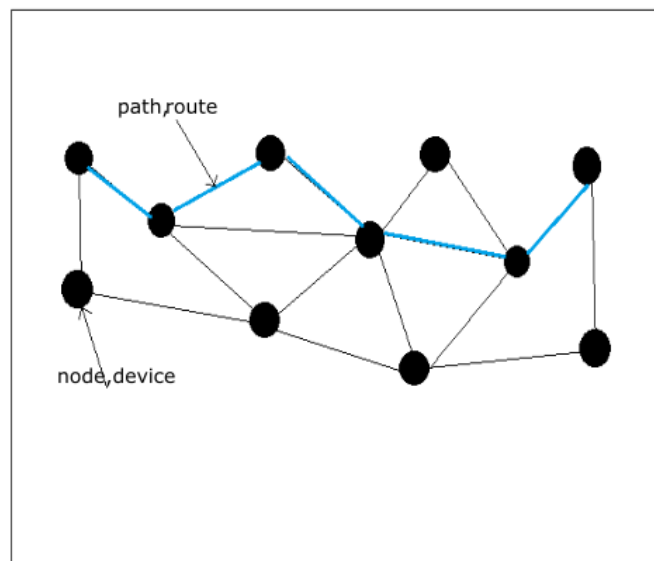


Fig.1:- MANET Architecture.

Working of p2p Application:-

A computer to computer file sharing organization that is working on the Internet could search an intended file as a neighbor system, that recognized by its unique ID. It can be obtained by applying base station and shared techniques that maps file name with the neighbor systems IP address by which the system can be arrived at destination. When we recognized the IP address of the system from where files could be downloaded, then network layer will maintain all steps and forward require to arrive at the system and download that file.

Characteristics of MANET:-

MANET has characteristics that make it very popular day by day. In mobile ad hoc routing protocol these characteristics are more desirable

Distributed operation:-

No network is present behind the central control for network activity. The system restrictions are distributed in multiple nodes. System that participate in an ad hoc network having cooperative nature should collaborate with one and all and communicate between them and every system functions as communicate when required, for fulfill a particular task or activity such as searching path and security.

Multi hop routing:-

If system is presently out of the communication range or domain and want to send important information to another node, the packet has to resend through more than one intermediary system.

Autonomous terminal:-

In an ad hoc network, each mobile device is an unattached device, self-configuring and independently move into the network. It can perform two tasks that are as a owner and a path director.

Dynamic topology:-

In a MANET, the system structure might be randomly modified and at the uncertain time. The mobile devices are independently to roaming randomly in the network domain along with various momentum. Therefore, The mobile device in the ad hoc network vigorously organizes routing between them as they roam aver all forming their own organization.

Light-weight terminals:-

In most of the states, the mobile devices in networks with low energy storage, less memory capacity and low CPU capacity, so that people can carry it everywhere.

Applications of MANET:-

1Military Tactical Operations:-

Military field appeal for potential and strong connection between soldiers for transmitting information. The MANET maintains the network data between them, their vehicles and headquarters.

Collaborative work:-

MANET also used for business purpose, they require for collective computing which may be necessary outside the office. Also, people may require to have outside meeting and share their data between them.

Local level:-

MANET can automatically connected fast and impermanent network for notebook system for transmitting the information between nodes e.g. colleges, meeting

Sensor networks:-

To handle home contrivances by MANETs in two states, i.e. closed and remotely traversing of things like any tool. And other things that regard to sensor

Disaster Relief Operations:-

Communication requires in the area that is damaged and broken down for that MANET is required.

Tactical Networks:-

MANET has many uses in the army. Some of these usages are in the military communication and operations among army units. Moreover, it is used in the automated battlefield.

Emergency Services:-

MANET is used in many operations at emerge time. For example, it is used in search and rescue operations. When disasters occur, MANET becomes significant in that casualties discovery and rescue. It is also useful in the case of environmental disasters, since it replaces the fixed infrastructure. It is also used in policing and fire fighting. It is useful in medical area, because it supports doctors and nurses in hospitals.

Home and enterprises Networking:-

MANET functions as home/office wireless networking. It is used for exchange data in the conferences and meeting rooms. It is used as personal area networks (PAN) and Personal networks (PN). It is also used as networks at construction sites.

Educations:-

MANET is of huge importance in the educational section. It is inevitable in the universities and campus settings. It is urgently required in virtual classrooms. In addition, it is used in ad hoc communications during meetings or lectures.

Advantages of MANET:-

1. It does not depend upon the central network (base station) administration.
2. In MANET network is self-configuring and system also work as a router.
3. MANET is not costly liken wired it has low cost.
4. MANET is very scalable - accommodates the addition.
5. In MANET at any place and time network can be established.
6. MANET has high reliability, because it has multiple paths, it's reliability get increased.
7. Robust owing to decentralize administration.
8. It has advanced flexibility.

Disadvantages of MANET:-

1. In MANET many security techniques are not functioning in good order in a network.
2. In a MANET, it is very hard to find the malicious if in network any kind of malware is present.
3. There are protocol in the wired network, but that is hard to structured in a wireless.

Peer To Peer File Sharing Protocols Over Manets:-

In 2003 the author L. barbosa e oliveira et.al. [1] Presently the detail study of Gnutella-like application running on MANET and they consider three protocols. The main goal is, to produce a certain scenario which appraises the work of routing technique. The evaluated protocols are Destination sequenced Distance vector routing, dynamic source routing protocol (DSR) and Ad hoc on Demand Distance Vector (AODV). The performance evaluation is examined over four properties that were overhead, movement, network frequency and node capacity. The one thing can notice in it was in few schemes all protocol was analyzed. They conclude that the significance of recognizing more accurate attributes of node to node application and attribute of network earlier than act on certain protocol.

A. Klemm et.al. [2] Proposed a special purpose method for document sharing application in ad hoc network is called as optimized routing independent overlay Network also called as ORION in the year 2003. And there techniques was based on an application layer overlay network. The inventory method was overlaid paths were set up on the requirement of the algorithm. And the transfer technique gave assurance of low communication overhead and it utilizes overlay routes for high fraction of successful downloads. ORION was a technique that responsible for the structure and conserve an application layer overlay network that set up routing of all types of packet, i.e. request, response and file transmission that p2p file sharing system required to route. The connection is preserved as long as it will essential.

The ORION combined the application layer process and network layer process which substantially decreases the overhead and increase the accuracy of search. The author assumes that ORION consists local repository which stores a set of files. ORION having and provide searching capacity for all files in the repository. ORION having two types of routing tables that are response routing table and file routing table for store nodes. Also ORION consists two different kinds of messages, i.e. REQUEST and RESPONSE packet. The QUERY message contains query string and RESPONSE contain a unique identifier. The data query packet send in blocks along the path provide by the routing tables. When data query was reached to that node preserving the file in the local repository. The system

In year 2004 Gang Ding and Bharat Bhargava[3] proposes the five routing approaches which having different complexity And enable node to node file sharing on ad hoc network. These five routing methods were assessed and compared the of routing complication, scalability, maintenance complication, implementation complication and power consumption. In this paper they present broadcast based and DHT based algorithm for peer to peer file searching

Broadcast over broadcast:-

This method was simple to implement, but undergo from scalability issue. The complexity of this routing method was $O(n)^2$

Broadcast:-

This method was removed virtual overlay in system to system file sharing protocol. Advantages of this are easy to implement and it obtains the shortest path. Because of all network was broadcast and steel flooded and its complexity is $O(n)$.

DHT over broadcast:-

This protocol is produce complexity in implementation. To maintain accuracy in the routing table the nodes should communicate each other. For MANET due to mobility this technique triggered more periodically. $O(n \log n)$ was complexity of this technique.

DHT over DHT:-

This technique introduces execution complexity at the network layer. This algorithm improves scalability. This technique was better than the previous one and had complexity $O(\log n)^2$. For energy consumption system can go into the sleep mode in DHT based routing protocol.

DHT:-

This proposes a DHT routing technique which reduced implementation complexity of DHT over DHT approach. The complexity of this protocol was $O(\log n)$. It gives considerable execution enhancement in Broadcast and DHT technique.

In year 2005 the author B. Tang et.al [4] introduces an integrated framework. In this paper they extract the commonalities of both file sharing among two systems and MANET routing protocol for more work to be done and interact with each other. It means they design a structure that combines the request/response structure on which mobile Ad hoc network routing and file sharing between the two systems was mixed seamlessly. They implement common request and response framework such that it reduces the overhead substantially and they called their approach as the integrated approach compared with a layered approach. In this approach they integrate FastTrack over AODV. They have three main approaches as layered, intermediate integrated and complete integrated. Into the layered approached FastTrack was implemented on the top of AODV. FastTrack provides the requested IP address of system which host data, then to find optimal route requester relies on AODV.

In intermediate approach, first preference gives to that node who has an accurate entry in that routing chart. A path discovery was initiated only when no such a system exists. This was the way to prevent flooding significantly. And complete-integrated approach was implemented to remove the redundancy of the message or to enhance the working of the system in a such a way that the average querying delay is minimized. The goal and intention of this approach were to discover the route to the system with the required data and build the path at the same moment rather than locating system needed data are then searching the path. By this way they integrate it and the experimental result shows that their design performed good enough than the layered design in term of traffic, all over delay and improve system performance by reducing packet overhead and increase the packet transmission rate.

Hoh and Hwang [6], represents a cross-layer structure in the year 2007 which was potential and ascendible p2p file sharing method for MANET based on swarm intelligence. This system is also referred as P2PSI. To detract the packet overhead and request response time they presented a cross-layer construction for P2PSI. This p2p file sharing over MANET applied a hybrid push/pull approach. P2PSI includes advertisement/push and discover/draw procedure. In the advertisement procedure HotSpot continuously publicize a seed packet. When a node receives seed packet from neighbors it store the messages of seed packet in the p2pSI cache table and in the ARA routing table, so node knows the existence of the HotSpot. In the discovery process requester sends the request packet to find out a file and intermediate nodes frontward the packet, and another node store the desire file messages and responds a reply packet to the requester. When replying message is received by the requestor then it recognizes hotspot id and establish a routine way for it and by using hotspot requester can download its file.

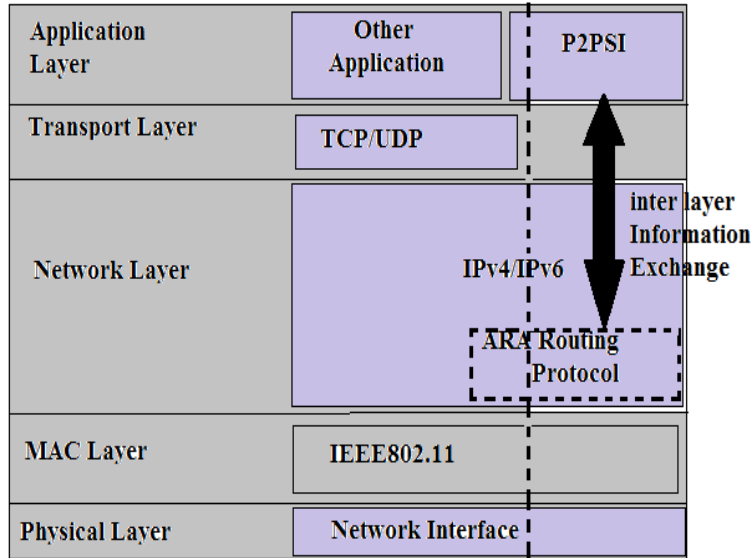


Fig.2:- Cross layer layout structure.

Here p2pSI used spirit of swarm intelligence for locating desire file quickly, even in dynamic topology of the network. Their performance on cross layer architecture is juxtaposed two present protocols called as CLdsr and CLdsdv. Their simulation on result proves that their architecture of cross-layer p2pSI gains better execution in view of the reduction in path length, curb overhead and achievement of request rate.

Author Ahmed abode, Li cui, Hsiao-Hwa Chen [5], proposed a concept on MANETs p2p file sharing application they say that modern peer to peer file sharing protocol for MANET use aggressive or reactive flooding methods for their route election and improvement. But this publication represents an advanced concept of route selection and recovery technique in year 2007. This mechanism is responsible for control overhead and resulting path quality. The modern approach was related to unicast packeting which was powerful and needed very small control overhead. Working on this technique is, they added new functionality on reactive route selection and recovery technique and also readjust it on a periodically. Set of route was available according to growing round-trip period and path allowing smartly switching during the file transfer path so that one that has least and having smallest round-trip period was applied for file transfer. In this technique their simulation result is responsible for achieving smallest period for file transfer, highly strong file transfer and because of incest it requires minimum message overhead.

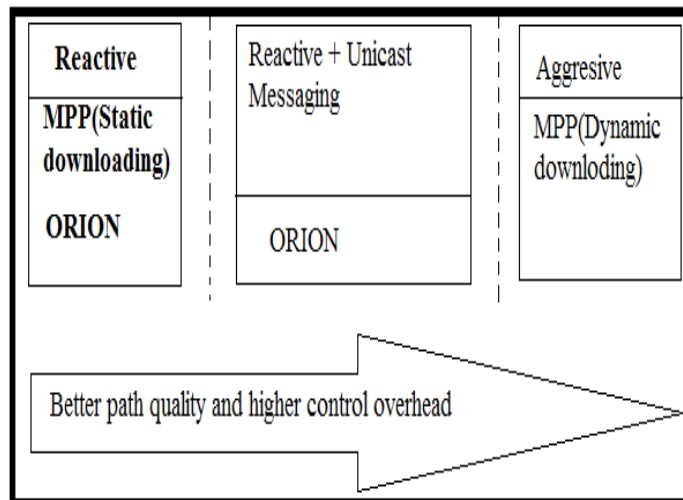


Fig 3:- Tradeoff between different path selection and recovery mechanisms.

In year 2008 U. Lees Joon sang park et.al. [7], Presented a new node to node file sharing technique for ad hoc network. The important component of this method were network coding and mobility assisted data propagation. This system to the system file sharing method was related to single hop communication which permit to smallest file downloading cunctation in comparison to present Mobile ad hoc network methods. Also in this they inspect the issue of running Bit Torrent i.e. A file swarming protocol in the MANET and they construct an absolutely new concept of technique to solve this problem.

Multihop communication is never used and it is implicit. In this they define a seed node which having whole file and has intent to share files. Seed node publicizes the availability of file by using one hop broadcast of description of the file. Description contains identifier name, file name, file size, etc.. Seed node divided into n pieces and define coded frame 'c'. The description is transmitted if system searches that a file has an interest, it broadcasts query consisting field and ID. Receiving such request the node acknowledges with freshly produced coded structure. The system carries on request to send coded frames till it collects ' n ' coded frames. By this way they prove that this Code Torrent or protocol offers less download delay as compared to existing file swarming protocol

Author J. Jia et.al. [8], Proposed a cluster rooted node to a node file sharing method for mobile ad hoc networks in the year 2009. In this paper they present that the method utilizes idea of cluster to decrease overhead and to form cluster three ways handshaking procedure was applied. In this protocol consist request agent and provider which was designed via cluster creation step. In cluster the request-response procedure was confining amid query agent and provider because of this overhead of the protocol is decreased effectiveness. In ORION approach system focus on only reducing query process. This method focuses on file transfer procedure and system download the file was assembled into multiple cluster. This protocol consists two steps that were clustered formation step and data transmission step. The cluster is formed by using three ways handshaking process after this method transfers to data transmission step between this stage the provider consigned data packet periodically to full cluster at the query of the request agent. The main goal of this protocol was to decrease the overhead of file transfer procedure. The result of simulation shows that a traditional p2p file sharing method performs better in terms of overhead, energy capability and download rate also improved.

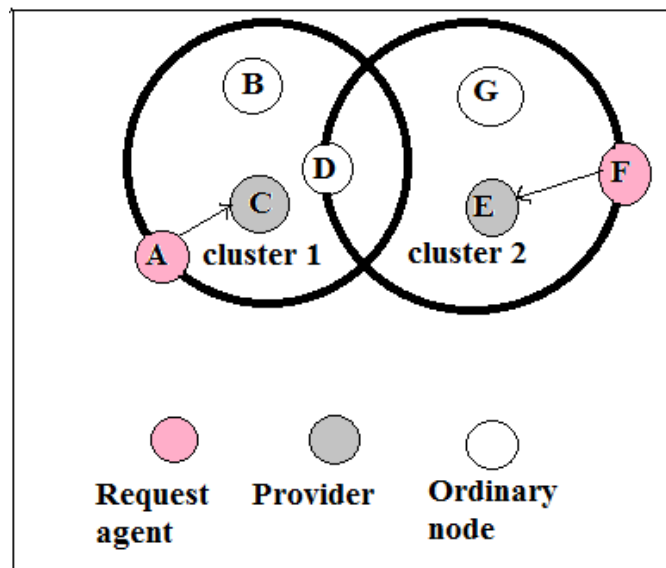


Fig. 4:- Cluster based P2P file sharing protocol

The author Li Liu, et.al. [9], Represented detail study on any system to system file sharing techniques in the year 2012. In this paper they also examine few current research in regard to searching techniques. The search algorithm is classified into four kinds of method that are DHT-based search method, advertisement-based method, flooding-based searching technique and social network-based technique. They classify technique based on their changing, searching principle. In this they gave a deep survey and they describe each searching method in detailed. In DHT-based searching algorithm, to map objects to corresponding nodes DTH are used. Pastry, CAN, Tapestry, Chord was related to the Distributed Hash Table. Flooding-based searching method is a simple computer network routing

algorithm in which every incoming packet is sent through every outgoing link except the one it arrived on. This was used in PDI, ORION, etc. Because of the high volume of traffic flooding method produce high overhead. The advertisement-based searching method is used in Geography-based content location protocol (GCLP) for periodically advertise content they were hosting to nodes, also it is used in P2PSI which is based on swarm intelligent, here file holder broadcast an advertisement message periodically to know what file is to be shared. By using an advertisement based method we can decrease the overload of flooding technique.

In year 2014 Author Kang Chen, et.al. [10], proposed a system to system, content based file sharing system and it is also known as SPOON for disconnected ad hoc network. In this they were proposed system uses a significant extraction technique to determine the nodes zest for content based file finding. Here for capability of file finding SPOON classify same important nodes that meet again and again to one and all. In this paper four components of SPOON have first been interest extraction which is algorithm that derive a nodes interest from its files. Second is community construction also algorithm that collects that nodes which having common interest and having a high probability to meet means it simply consider the meeting frequency of the node. Third is exploiting node stability and mobility that is the node role assignment algorithm, it takes benefit of node mobility for effective file searching. It designates a stable node that has the tight connections with others in its community as the community coordinator to guide intracommunity searching fourth one is interest oriented routing which is interest oriented file searching and retrieval scheme. Firstly a system requests neighboring system, and rely on coordinator to find out the whole community. If its decline, the intercommunity finding uses a diplomat to transmit the request to a equate foreign community. A detected file was responded back via the search route or the IRA if the route crack. SPOON enhances the file sharing efficiency and efficiency of SPOON is proved by deployment on the real-world GENI Orbit platform and the trace driven experiment.

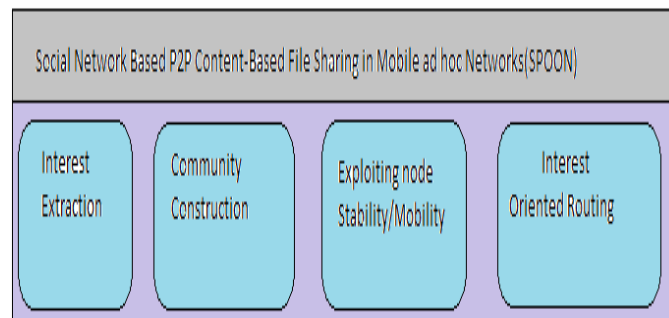


Fig.5:- Component of SPOON

Conclusion:-

This paper has represented the deep study of all protocols which used for p2p file sharing in MANET. This paper also mentioned how protocols worked and described in detailed all protocols and also analyzed the properties of protocol and methods.

References:-

1. Leonardo Barbosa e Oliveira, Isabela Guimarães Siqueira and Antonio Alfredo Ferreira Loureiro, "Evaluation of Ad-Hoc Routing Protocols under a Peer-to-Peer Application," 2003 IEEE conference.
2. A. Klemm, C. Lindemann, O. P. Waldhorst, "A Special-Purpose Peer to-Peer File Sharing System for Mobile Ad Hoc Networks," 2003 IEEE 58th Vehicular Technology Conference, vol. 4, pp. 2758-2763, Oct.2003.
3. Gang Ding and Bharat Bhargava, "Peer-to-peer File-sharing over Mobile Ad hoc Network," 2004 IEEE Proceedings of the Second IEEE Annual Conference on Pervasive Computing and Communications Workshops (PERCOMW'04) -7695-2106 2004.
4. Bin Tang, Zongheng Zhou, Anand Kashyap and Tzi-cker Chiueh, "An integrated approach for P2P file sharing on multi-hop wireless networks," 2005 Wireless And Mobile Computing, Networking And Communications, 2005. (WiMob'2005), IEEE International Conference on Aug 2005.
5. A. Abada, Li Cui, H. Huang and Hsiao-chen, "A Novel Path Selection and Recovery Mechanism for MANETs P2P File Sharing Applications," 2007 IEEE Wireless Communications and Networking Conference. WCNC 2007, 1525-3511, June 2007.
6. Cheng-Chang Hoh and Ren-Hung Hwang, "P2P File Sharing System over MANET based on Swarm Intelligence: A Cross-layer Design," 2007 IEEE Wireless Communications and Networking Conference, 2007. Vol. 1525-3511, Mar 2007.

7. Uichin Lee, Joon-Sang Park, Seung-Hoon Lee, Won W. Ro, Giovanni Pau, and Mario Gerla, "Efficient Peer-to-Peer File Sharing Using Network Coding in MANET," 2008 IEEE Journal of Communications and Networks, Volume: 10. 1229-2370, Dec 2008
8. Junmin Jia and Chun Meng, "A Cluster-based Peer-to-Peer File Sharing Protocol for Mobile Ad Hoc Networks," Computer Network and Multimedia Technology, 2009. CNMT 2009. International Symposium *IEEE* Jan 2009.
9. Li Liu, Yanfang Jing and Yue Zhang, "A Study on P2P File Sharing Methods on MANET," 2012 *IEEE* Consumer Electronics, Communications and Networks (CECNet), 2012 2nd International Conference Mar 2012.
10. Kang Chen, Student Member, IEEE, Haiying Shen, Senior Member, IEEE, and Haibo Zhang, "Leveraging Social Networks for
11. P2P Content-Based File Sharing in Disconnected MANETs," 2014 *IEEE* Transactions on Mobile Computing, Volume: 13.1536-1233, Feb. 2014
12. C. Lindemann and O.P. Waldhort, "A Distributed Search Service for Peer-to-Peer File Sharing," Proc. Int'l Conf. Peer-to-Peer Computing (P2P '02), 2002.