Effectual File Sharing with Role Switching Algorithm in MANET'S

S. Kaarthiga[1]
Dept. of Information Technology
KNCET, Trichy.
Tamil Nadu.

S. M. Keerthana[2]
Dept. of Information Technology
KNCET, Trichy.
Tamil Nadu.

P. S. Mano[3]
Dept. of Information Technology
KNCET, Trichy.
Tamil Nadu.

S. Anbarasan[4]
Dept. of Information Technology
KNCET, Trichy.
Tamil Nadu.

Abstract— **Peer-to-peer file sharing unchanging in mobile ad hoc networks (MANETs) adapts to the nature in disconnected Manet's. SPOON (Social network based P2P content-based file sharing in mObile ad hOc Network) shares file lacking in originality by interest extraction algorithm, which spiral a node's interest from content-based file searching. Active node earns lead for file sharing as ambassador in addition stable node for organizing in the community as directory of file for regular with community followers. QRY (QRY) communications is ongoing broadcasted in looking forward of attainment destination and UPD (Update) communications by, TORA. For supreme file sharing among communities, role-switching of active node and stable node switched based on unchanging. This hold up complete nodes in community to be erudite with index of file based on network size and to avoid loading nodes, award with extra enticements for amended consideration. User can search, share file within MANET subscription failsafe service, stay obtainable in its environs. We tested, our system on the experiment NS2 simulation with simulated social network scenarios. The test significant lower transmission rate and recovers file sharing accomplishment rate compared to current methods.**

Keywords—Peer-to-peer; content based file sharing; MANET; Interest extraction algorithm.

I. INTRODUCTION

A Wireless technology a swift sprouting, and in concert increasing role in lives of people all through the world [1]. Ad hoc is a technique for wireless devices to communicate as the crow flies with each other [2], [3]. Mobile ad hoc network (MANET) is a self-configuring infrastructure less network of mobile devices connected by wireless. Nominal configuration and quick setting out make MANET ready to be used in crisis state of affairs like natural, human prompted catastrophes, military skirmishes. Indebted to these sole physiognomies, MANET, is flattering more and more far and wide instigated in the built-up. Each device in

MANET is free to move independently in any direction, and will therefore change it links to other devices habitually. However, this communication is inadequate to the series of nodes. Ad hoc haymaking as a fleeting fallback mechanism if normally available infrastructure mode trappings stop in effect.

In service with ad hoc network, genre consents entire devices in the interior range of each other to discover [4] and

lead into peer-to-peer approach with decentralization. In our day, PDAs have just about the same proficiencies that of conventional PCs in spite of their trifling size and heaviness. Peer-to-peer (P2P) figuring or networking, a distributed application architecture [5] that partitions tasks or work loads amongst peers. Peers are by the same token confidential, equipotent participants in the bid. They are said to form a peer-to-peer network of nodes. Peers make portion of their resources, such as doling out power, disk concentrated effort away or else link bandwidth, as the crow flies available to the other network contestants, devoid of the prerequisite for central coordination by server of stable hosts. A dispersal application architecture that dividing wall tasks between peer systems are not ample for given that file sharing in such an milieu in the meantime:

- Such networks can be molded anytime and everyplace shorn of calling for an infrastructure.
- Nodes in the network may lean in transit for to change their locations habitually.
- There is lack of commonly putative and used ethics for routing data in mobile ad-hoc networks.

As mobile digital devices are carried by people that usually belong to certain social relationships, SPOON on the P2P file sharing in a disconnected MANET[6] consisting of mobile handlers with social network properties constantly moving, hence, more challenge for file sharing. Outmoded methods supporting P2P Manets are flooding-based or advertisement-based. The earlier modus bank on flooding intended for file searching over and done with pheromone. Conversely, they hint to high overhead in vogue airing. In such a file sharing routing, nodes bump into and altercation requests too files in the format of text, short videos, voice clips in different categories carry out by ambassador.

In latter methods, nodes advertise their obtainable files, physique content tables, and onward files according to these tables. Such transient network connections have posed a challenge for the development of P2P MANETs. But they have low search efficiency because of perished routers in the content tables caused by transient network connections. SPOON is novel in that it leverages social network properties of both node interest and movement pattern.

Special Issue - 2015

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCICN-2015 Conference Proceedings

- It pigeon hole common-interest and frequently encountered nodes into social communities.
- Deliberates the frequency at which node meets different interests rather than different nodes in file searching.
- Elects stable nodes in a community as coordinators and exceedingly mobile nodes that travel frequently to foreign communities as ambassadors.
- Safeguards that a query canister be dispatched en route for the community of the queried file quickly.

II. RELATED WORK

A. Content-Based File Sharing

Upon receiving the request, the coordinator in the foreign community ensures its file index to see if its community has the file [7]. If not, the coordinator recites the intercommunity file searching by looking up its ambassadors to check for further forwarding prospects. In Figure.1, Gamble the file exists, the coordinator queries for the file from the file holder when meeting it and leads the file back to the file to the requester's community through the corresponding ambassador (B). The coordinator (A) of the requester's community will advance forward the file to the requester, forward the request to the foreign community toning the queried file. The route of file searching, in which a requester (node R) in community B generates a file request. Subsequently its neighbor within count hops do not partake the file, the request is at that juncture dispatched to the community coordinator A.

B. File Searching in SPOON

User with communal interest lean towards to bump into with each other more every so often than with others. Based on this, Interest-Oriented Routing Algorithm (IRA) selects endorsing node by making a grant for the likelihood of consultation interest keywords pretty than nodes.

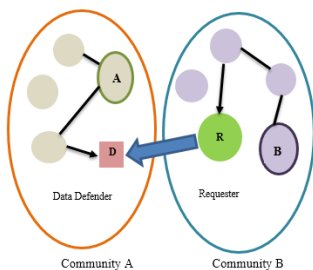$$V_H = (t_0, w_{h0}; t_1, w_{h1}; t_2, w_{h2}; .....; t_n, w_{hn}) \quad (1)$$

Fig.1 File Searching in SPOON

C. P2P File Sharing Over MANET Based On Swarm Intelligence

The bouncy nature of MANET causes many defies in designing robust in addition to scalable P2P system. Granting flooding-based of techniques are made known to be robust in

highly bouncy linkage, it hints to underprivileged adeptness in footings of bandwidth usage and scalability. An efficient and scalable P2P file sharing system based on swarm intelligence for MANET, referred to as P2PSI [4]. By spread on the behavior of the real ant colonies, P2PSI preserves the capability of adaptive learning and is able to cope with mobility problem shorn of flooding. Besides, we as well contemporaneous a cross-layer architecture for P2PSI to reduce the redundant message overhead and query potential. Enactment of our cross-layer proposal P2PSI is compared with two existing cross-layer design service discovery protocols, namely, $CL_{performance}$ and CL_{dsr} through simulation in terms of triumph ratio, in addition path length.

D. Peer-To-Peer Networks

An adaptive content-driven routing and data dissemination algorithms for shrewdly routing search queries in a peer-to-peer network that backings mobile users [8]. Node build content synopses of their data and adaptively disseminate them to the most applicable nodes. Bring into being on the content summing up, a routing contrivance is being built to forward the queries to those nodes that have a high probability of given that the scalability and significantly mend resources usage by saving both bandwidth and processing power [9].

III. SYSTEM ANALYSIS

A. Interest-Oriented Routing Algorithm (IORA)

If the coordinator treasure trove that the habitat community cannot placate a request, it unveilings the intercommunity searching forwards the request to an ambassador that will travel to the foreign community that cup tie the request's interest[10] [11]. In the course of the search, a node sends a message to an additional node using the interest-oriented routing algorithm, in which a message is always promoted to the node that is in the offing to clutch or to bump into the query keywords [12] [13]. Obviously, a node springs a file vector for each of its files from its metadata. In SPOON, every single node sustains a history vector that records its frequency of stumble upon concern keywords and forward the queries and reply's. The history vector is all the rage the form:

$$V_H = (m_0, w_{h0}; m_1, w_{h1}; m_2, w_{h2}; ....; m_n, w_{hn}) \quad (2)$$

The history vector is used to appraise the likelihood of summit the queried content. The destination of a request is exemplified by a vector

$$V_{dest} = (m_0, w_0; m_1, w_1; ....; m_n, w_n) \quad (3)$$

In IRA, a node expenditures the qualification score to evaluate its neighbor's likelihood to be or to bump into the file holder.
The qualification Q of neighbor is measured by

$$\eta = gsim$$

Special Issue - 2015

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCICN-2015 Conference Proceedings

$$(V_{dest}, b_i)^+ (1 - {}^g) sim(V_{dest}, V_{Hi}) \qquad (4)$$

where bi and vHi are the node vector and history vector of node i, in turn. The factor of sim(Vdest, VHi) intentions to treasure trove a node that is very to be expected to meet the destination in its movement, g is used to rheostat the weight of these two factors. In IRA, as soon as a node receives a message, if its neighbor with the highest Q has sophisticated Q than itself, it straight on the message hash out at the destination. Coordinators do not use IRA on the other hand send messages to its community members when meeting them since they habitually have constricted connections with all community members.

B.Intracommunity File Searching In Addition To Retrieval

$$V_c = m_0, h_0; m_1, h_1; \dots; m_n, h_n \qquad (5)$$

Each query is associated with a counter (D) indicating the number of hops it can travel. The *D* is determined by one after each forwarding. Subsequently, the query is set off by users, term weight in v_c are relentless values.

The requester assesses the resemblance between the *query vector* and *community vector* of the community it be in the right place to. If *sim* $(v_c, v_H) < T_s$, the query is sent to the coordinator of the community directly *(i.e., equals 0)*. Otherwise, equals*1* when the counter (*D*) is larger than *0* in addition *0* if not.

Explicitly, the requester sends out a query to top *Q* neighbors with highest *U*. Having *U > 1* copies of a request can enhance the efficiency of files searching. We call this strategy *multihop promoting*. The hop counter of a query is decreased by one after each forwarding. If the file is not found when *D = 0*, it is forwarded to the community coordinator (=0). When a node receives multiple copies of query, it only processes the first one. When node C_1 receives a request, if $v_{dest}= v_Q$ and *sim* (v_{dest}, vc_j) grasps the similarity threshold specified by the requester, it first tries to send the satisfied flies back to the requester along the unusual path. Uncertainty forwarder scheduled the path is not obtainable due to node freedom of movement, IRA is rummage sale to onward the file.

C. Community Erection

Social network theory reveals that people with the identical interest have a tendency to meet frequently [14] . By exploiting this chattels, SPOON pigeonholes node with common interests
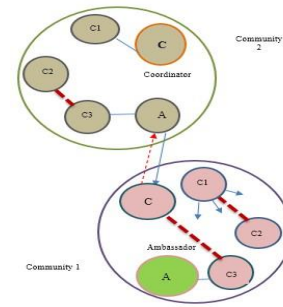

Fig.2 Role – Switching in Disconnected Manets

and frequent contacts into a community to facilities interest-based file searching, as latter in section III.1. Nodes with multiple interests belong to compound communities. The community erection can easily be conducted in a centralized unchanging by collecting node interests and contact frequencies commencing all nodes to a central node [15]. Conversely, considering that the proposed system is for distributed disconnected MANETs, in which opportune statistics crew plus distribution is nontrivial, we promote propose a decentralized method. When two nodes, say C1 and C2, meet, they consider two cases for community creation.

- Nodes do not belong to any communities.
- At best one of them is even now a member of a community.

In this case, they weigh up the similarity between each pair of their interest vectors using section III. A pair of interest groups, say Ic and Id with interest vectors c and d is called matched interest group

$$_W I_{c*} W I_d sim(V_c, V_d) \geq T_1 \qquad (6)$$

where T_1 is the predefined threshold. The intent of taking into account the weight of each interest group is to eliminate noise. Interest groups with a small number of files and triumph better interest clustering. If C1 and C2 have at least one pair of matched interest group, and their contact frequency, F (C1, C2) is higher than the top h1 percent highest encountering frequencies in either one node, the two nodes form a newfangled community. The keywords in their matched interest groups, agreeing weights be tantamount to the community vector (vc) of the community and helps to attain a better file sharing in social network. Sustains the same all through and assists with pheromone technique.

IV.ROLE-SWITCHING ALGORITHM

A. Node Role Assignment in group

An aforementioned study has publicized that in a social network entailing of mobile users, only a part of nodes have high degrees [5]. We habitually treasure trove an important or widely held person who coordinates members in a community in our daily life. For example, the manager who taking in charge in charge of different types of node mobility for file sharing. We delineate community coordinator and ambassador nodes in the interpretation of a social network. A community

Special Issue - 2015

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCICN-2015 Conference Proceedings

coordinator is a vital and widely held node in the community. It keep vade mecum of all files in the aforementioned community. Per captia community devours one and only ambassador intended for each recognized foreign community, which obliges as the conduit to the community. The coordinator in a community conserve to map queries to ambassadors for intercommunity searching. The number of ambassador and coordinators can be in the swing of things based on the network size and amount of work to avoid overloading these nodes.

B. Coordinator Node Selection in group

We define a stable node that has tight contact frequency with other community members as the community coordinator. Appearing in network scrutiny, centrality is every so often used to reveal the relative importance of a vertex within the network. We at that juncture take on the improved degree centrality routing in social network. It disperses weight to each link based on the contact frequency, for coordinator selection as it reflects the tightness of a node with other community members. In the preliminary phase of coordinator discovery, each node, say node C_i in a community accumulates contact statistics from its neighbors in the matching community and then calculates its degree centrality by

$$D_{xm} = \sum_{i=1, i \neq m} c w_{ml} \qquad (7)$$

where W_{ml} is the link weight between C_i and C_j and C is the number of neighbors in the same community. To mirror the chattels that the coordinator has the most connections with all community members, W_{ml} equals to 1 if the touching base frequency between C_i and C_j is larger than a threshold and 0 otherwise. All the same such a method cannot warrant its connection to very community member, it safeguards that the coordinator has the tightest on the whole connection to all community members. Each node episodically checks its degree centrality and airings such information to all community members. Uncertainty a node take delivery of certainly not larger centrality keep a tally than its own centrality for three serial period, it claims itself as the potential coordinator. The potential coordinator would indorse its eminence as the coordinator when meets the aforementioned one. If it is deep-rooted, it then requests the community tidings from the old coordinator. As well when the new coordinator bump into community members, they altercation tidings for group vector keep informed and ambassador assortment, not counting entreaty routing.

B. Ambassador Node Selection in group

An ambassador is rummage-sale to bridge the coordinator in its home community and a foreign community. We routing the product of a node's contact frequency with its coordinator and that with the foreign community for ambassador selection. Each node n calculates its utility value for foreign community

$$K_{nf} = F(C_i, C_f) \times F(C_i, C_c) \qquad (8)$$

Where Cf epitomizes foreign community f, Cc is the coordinator in its home community. Each node report its efficacy values for foreign communities it has bump into to the coordinator in its home community. Then, the community coordinator cherry-picks one ambassador for each known foreign community. Also, the node that has the highest inclusive contact frequency with every bit foreign communities is opt for as the default ambassador. In paradigm, a request fails to treasure trove in time ambassador; the failure to pay ambassador can lug request and seek out for potential forwarders in foreign communities.

In exceeding end, ambassadors are the rudimentary to connect different communities efficiently, Coordinators accomplish balance amongst centralized and distributed searching by scrutiny whether a community can satisfy a query swiftly, which is imperative in disconnected MANETs, also airing is used in coordinator medley, the outlay is inadequate, since, node is extant in the mid of community. We can set a long interbroadcast time extent for the reason that nodes habitually have stable degree centrality.

V. CONCLUSION

This term paper, we intend a Social network based P2P cOntent file sharing system in disconnected mObile ad hoc Network. SPOON pondered both node interest and contact frequently for skilled file sharing through ambassador, by dint of podcasting. Community is intended based on *interest extraction algorithm* pinpoints node's interests, *community construction* erects common-interest node with frequent contacts into communities. The *node role assignment* component adventures node with tight connection with community members for intracommunity file searching and highly mobile nodes that social call external communities frequently for intercommunity file searching. The *interestoriented file routing* pick out forwarding nodes for queries based on interest similarities. *Role-switching algorithm* assign role of coordinator besides ambassador in each community based on workload and network size to the nodes benefit from pheromone. The system carry out on simulation to substantiate the efficiency of SPOON in disconnected MANETs. In future, we will discover how to determine apposite thresholds in SPOON, how to familiarize SPOON to larger and more disconnected networks.

REFERENCES

[1] "A Market Overview and Introduction to Gypsii", Http://Corporate.Gypsii.com/Docs/Marketoverview,2013.

[2] A. Fast, D. Jensen, and B.N. Levine, "Creating Social Networks to Improve Peer-To-Peer Networking" Proc. 11th AcmSigkdd Int'l Cong. Knowledge Discovery in Data Mining (KDD'05), 2005.

[3] A. Iamnitchi, M. Ripeanu, E. Santos-Neto and I. Foster, "The Small world of File Sharing" IEEE Trans. Parallel and Distributed Systems, Vol.22, No.7, Pp. 1120-1134, July 2011.

Special Issue - 2015

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCICN-2015 Conference Proceedings

[4] C. Lindermann 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.

[5] C. Hoh and R. Hwang, "P2P File Sharing System over MANET Based on Swarm Intelligence: A cross-Layer Design," Proc. IEEE Wireless Comm. And Networking Conf. (WCNC '07), Pp.2674-2679, 2007.

[6] E. Yoneki, P. Hui, S. Chan, and J. Crowcroft, "A Socio-Aware Overlay For Publish/Subscribe Communication in Delay Tolerant Networks,"
Proc. 10th ACM Symp. Modeling, Analysis, and Simulation of wireless and Mobile Systems (Mswim'07), 2007.

[7] J. Reich and A. Chaintreau, "The age of impatience: Optimal Replication Schemes for opportunistic networks," Proc. Fifth Int'l Conf Emerging networking experiments and technologies (Conext'09), 2009.

[8] Kang Chen, HaiyingShen, Haibo Zhang, "Leveraging Social Networks for P2P content-based file sharing in disconnected manets", 2014.

[9] K. Chen and H. Shen, "Leveraging Social Networks for P2P ContentBased File Sharing in Mobile Ad Hoc Networks" Proc. IEEE Eighth Int'l Conf. Mobile Adhoc and Sensor Systems (MASS), 2011.

[10] M. Papadopouli and H. Schulzrinne, "A Performance Analysis of 7DS: A Peer-to-Peer Data Dissemination and Prefetching Tool for Mobile Users," Proc. IEEE Sarnoff Symp. Digest Advances in Wired and Wireless Comm., 2001.

[11] P. Costa, C. Mascolo, M. Musolesi, and G.P. Picco, "Socially-Aware Routing for Publish-Subscribe in Delaly-Tolerant Mobile Ad Hoc Networks," IEEE J. Selected Areas in Comm., vol.26, no.5, pp. 748-760, June 2008.

[12] T. Repantis and V. Kalogeraki, "Data Dissemination in mobile Peer-toPeer Networks," proc. Sixth Int'l conf. Mobile Data Management (MDM'05), 2005.

[13] V. Carchiolo, M. Malgeri, G. Mangioni, and V. Nicosia, "An Adaptive overlay network inspired by social behavior", J. Parallel and Distributed Computing, Vol. 70, Pp. 282-295, 2010.

[14] V. Lenders, M. May, G. Karlsson and C. Wacha, "Wireless Ad Hoc Podcasting", ACM SIGMOBILE Mobile Computing and Comm. Rev, Vol.12. Pp.65-67, 2008.

[15] W. Hsu, T. Spyropoulos, K. Psounis and A. Helmy, "Modeling TimeVariant User Mobility in Wireless Mobile Networks", Proc. IEEE INFOCOMM, 2007.