Improving Social Networks for P2p Content and Context Based File Sharing In Mobile Ubiquitous Computing

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Abstract: *Mobile Ubiquitous Computing (MUC) is a group or collection of wireless mobile devices which forms a network temporarily and dynamically. The main application in Ubiquitous Computing is file sharing which is based on P2P (Peer to Peer) networks. The flooding based and advertisement based file sharing method in Ubiquitous Computing Network can have high overhead and low scalability which is used for connected Ubiquitous Computing Network. Another category, social contact based is implemented for the opportunistic nature of disconnected Ubiquitous Computing Network where the social issues are not considered. In this paper a novel P2P content and context based file sharing system, named PCFM is proposed for disconnected Ubiquitous Computing Network for social networks. The proposed approach has a feature extraction algorithm for identifying node features. It also includes community structure and node role assignment for designing stable node structure and an interest oriented file sharing scheme to increase file sharing efficiency. To further increase the efficiency of file sharing additional properties like prefetching of the file, completion of queries, prevention and elimination of loops, are considered.*

Keyword — *Ubiquitous Computing Network, Social Networks, P2P Network, Content and Context based file sharing*

I Introduction:

Ubiquitous computing specifies infinite very tiny, communication of wireless microprocessors, which can be inbuilt to the objects visibly or invisibly. It consists of sensors which can record the surrounding information of the object providing the data processing and sharing opportunities. It is omnipresent with the network where it is deployed. It is also found in very large in numbers everywhere and all over the place. It can be encountered in infinite situations of different scenarios. The devices become not visible and useful satisfying the user needs. There are different embedded and handheld devices which is of mainly MUC providing the services to the users. Generally the MUC has very less power and small range of communication bandwidth. The below Fig 1 shows the ubiquitous computing devices.

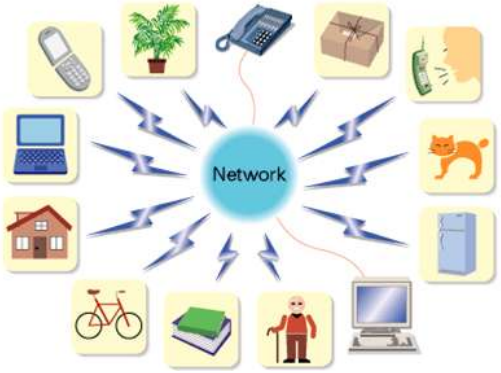

Fig 1: Different devices in Ubiquitous Computing

In Mobile Ubiquitous Computing comprising of computerized gadgets, hubs are continually moving, shaping detached Mobile Ubiquitous Computing with astute hub experiencing. Such transient system associations have represented a test for the improvement of P2P Mobile Ubiquitous Computing. Customary techniques supporting P2P Mobile Ubiquitous Computing are either flooding-based or promotion based. The previous routines depend on flooding for document looking. On the other hand, they prompt high overhead in show. In the recent systems, hubs publicize their accessible records, construct substance tables, and forward documents as per these tables. Yet, they have low pursuit proficiency on account of lapsed courses in the substance tables created by transient system associations. Likewise, promoting can prompt high overhead.

II Related Work

Tanzeem Bin Noor et.al[1] in their exploration fill in as built up a bunching plan for P2P structures. Spread taking care of is a prestigious great model for diverse applications that permit direct message going among partners. The current P2P look for figuring's in MANET (Mobile Ad-hoc Network) are flooding-based inquiry that creates much activity and framework overhead. Archive looking for profitability of conveyed (P2P) arrange chiefly relies on upon the diminishment of message overhead. The technique deals with a full sort of pack based P2P document hunting approach down MANETs, which thinks generally over lessening of control messages.

Hasan , Metin , and İbrahim[2] in their commitment for P2P record sharing has proposed a

novel system. Record partaking in remote extemporized systems in an associate to-companion way forces numerous difficulties that make customary shared frameworks working on wire-line systems inapplicable for this case. Data and workload diffusing and in promotion steering are significant issues for individuals from a remote specially appointed system, which are just mindful of their neighborhood. They have proposed a framework that illuminates distributed record sharing issue for remote extemporaneous frameworks. The proposed procedure fills in as demonstrated by shared standards, without obliging a focal server, and disseminates data with respect to the area of shared documents among individuals from the system.

Tommy[3] has done research on data sharing in MANET's. Access to information is fundamental all through today's and tomorrow's distributed applications, paying little heed to range, time, and computation environment. In the wired Internet, shared correspondence has had an incredible effect how information is shared. Right away, when the world persistently is turning out to be more portable there is a need to apply the same capabilities in this space too. Wired system advances are in light of presumptions like that the hubs have a fixed place and therefore non-adaptable.

Basit Qureshi et.al[4] have dealt with trust based P2P administrations for separated MANET's. In postponement tolerant separated Mobile Ad-hoc Networks (MANETs), cell phones speak with one another as they meet craftily setting up distributed (P2P) associations. The proposed structure uses a decentralized trust model and a P2P correspondence convention for secure record trade in a deft store-convey and forward framework. They have analyzed the utilization of the framework and examination with a gnutella style P2P record sharing application in a detached MANET.

Li Liu et.al[5] in their study paper on P2P record sharing calculations over MANET's have talked about different routines included in the data sharing. Document sharing is a prevalent used application, which has basic status in MANETs. Record partaking in MANETs is basically taking into account Distributed (P2P) system. What's more, a P2P record sharing framework for the most part comprises of an inquiry calculation and a document move convention in which look calculation pulls in a great deal of thought. They graph and inspect the starting late inquires about record sharing counts. Moreover, they examine some difficult issues which motivate the future work.

Junmin Jia et.al[6] in their exploration on P2P document sharing proposed a bunch approach. Diminishment of overhead is vital in expanding the adaptability and force productivity of distributed (P2P) document sharing frameworks for portable specially appointed systems (MANET). Beforehand analysts predominantly centered around lessening overhead of inquiry process, and gave careful consideration to document exchange process. The work shows a bunch based P2P record sharing tradition for MANET, focusing on report trade process.

III Proposed System

A novel social network-based Peer to Peer content and context based file sharing system in MUC is proposed. The proposed architecture uses a feature identification algorithm to identify the feature of node through its storage of data for the type of data and context-based searching of file. Main concentration is on the sharing of files in mobile ubiquitous computing where in which the group comprises of various types of portable clients with interpersonal organization properties. The proposed system parallels and combines both mobile node feature and meeting frequency for effective and efficient file sharing. To achieve this kind of file searching, the proposed system merges common-interest versatile hubs that often meet with one another as groups. Proper algorithms need to be implemented for accessing and querying the files with in the clusters and between the clusters. And if the node moves out of the region through the help of additional nodes the data retrieval should be achieved.

By improving these kind of features of social networks, we derive a novel social network-based Peer to Peer Content and context-based File sharing in Mobile Ubiquitous Computing (PCFM) where it may go out of network, which has four components.

1. Considering the factors, a feature extraction algorithm is proposed to identify the node's features from its files and kind of requests it will send. The property facilitates requests in content and context - based data accessing or file sharing and other modules of PCFM.

2. The proposed approach is referred to a combination of mobile nodes that consists of same features and also meet each other nodes often as a cluster or community. Accordingly a user node which has more likelihood to identify attentive files in its existing cluster. If the condition fails, the user node depends on other nodes which very frequently move to different clusters for content based file retrieval and searching. Thus, it is proposed with another algorithm for cluster construction to construct groups to enable fast data requesting or retrieval.

3. The proposed architecture consists of algorithm for assignment of nodes role which takes advantage of mobility of node and energy considerations for capable data searching. The algorithm defines a node which has more energy and is stable node along with that which has the tightest connections or high degree centrality with others in its community as the cluster head or community coordinator to perform intracommunity file searching. For each and every foreign community that exists, a node that frequently moves to it is stated as the ambassador node for intercommunity searching and a default ambassador node is also selected which moves to all communities very oftenly.

4. The PCFM construction modelling is a component situated document looking and recovery conspire that makes employments of an element arranged steering calculation (FRA) or more three parts. The document recovery or seeking plan has two distinct stages : Between and intra-group looking. In the first, a hub in group first questions neigh boring hubs, then depends on bunch facilitator to locate the whole home group. On the off chance that if there should be an occurrence of disappointment, the intercommunity looking makes employments of a group diplomat to send the solicitation to a particular outside group which is of high coordinating estimation of documents. On the off chance that the document is available then it is sent back through the chose course or the FRA if path breaks. PCFM is different in that it enhances informal community assets of both hub elements and portability design. First and foremost, it orchestrates same-intrigue and all the more much of the time meeting hubs into social groups or groups. Secondly, it accentuation the recurrence at which a hub meets different hubs of diverse component instead of distinctive sort of hubs in record seeking. Thirdly, it chooses steady hubs in a group as group organizers and more versatile hubs that move oftentimes to different groups as bunch representatives. Such a square structure plainly guarantees that a solicitation question can be sent to the different group of the asked for record rapidly. PCFM additionally consolidates extra procedures for pre fetching of records, questioning consummation and counteractive action of circles, and hub beat thought to further enhance report looking capability.

- The proposed system PCFM selects both node feature and meeting probability for efficient file sharing.
- The proposed system PCFM considers advantage of mobility of nodes by designating stable nodes and more movable nodes.
- Strategies for pre-fetching of files, completion of queries and avoiding of loops, and considering about the node churn are used beat thought to further improve document looking proficiency.
- P2P over Mobile Ubiquitous computing is the one of the popular used approach of sharing of files within networks
- Single route identification may yield n number of many routes from source to the destination, because of moderate hubs answering from neighborhood stores.

There are four models used in this paper
1. Network Model
2. Community Construction using AGNES
3. Node Role Assignment
4. Feature-oriented Routing Algorithm

A. Network Model

Consider a heterogeneous social system comprising of portable clients, just a some piece of hubs have high degrees. We can regularly locate a vital or well known individual who coordinates individuals in a group in our day by day life. We characterize group facilitator and minister hubs in the perspective of an informal organization. A group facilitator is an essential and prominent hub in the group. It saves lists of all records in its group. Every group has one minister for each identified outside group, which assists as the scaffold to the group.

- User have types which they request for file frequently.
- 80% of the files that are shared fall in to only 20% of total file.
- To access interest , nodes uses keywords of files called Document clustering technique.
- Generate file vector by metadata.
- Vector form (Keyword: Weight)
- Similarity of two file vectors called common vector which consisting of common keywords along with weight.
- After accessing file vector ,nodes interest group gets created.
- Similarity matrix is generated.
- AGNES for clustering(Aggomolerative nesting bottom up approvable).

B. Community Construction using AGNES

The group development can undoubtedly be led in a unified way by gathering hub intrigues and exchange frequencies from all hubs to a focal hub. Nonetheless, bearing in mind that the projected framework is for dispersed disengaged MUC, in which opportune data gathering and dispersion is non-trifling. At the point when two hubs, say N1 and N2 , meet, they study two cases for group creation: (1) they don't have a place with any groups, and (2) no less than one of them is an individual from a group. The reason for considering the heaviness of every vested party is to take out the commotion of

vested parties with a little number of records and accomplish better enthusiasm grouping.

- Nodes of common feature or interest tend to meet frequently.
- Makes use of node interests and contact frequencies.
- Two cases of community creation
  1.The nodes doesn't belong to any community.
  2.The nodes atleast one is already a member.

Case1: node N1 has interest group G1 with vector V1 and node N2 has interest group G2 with vector V2 .If the similarity between G1 and G2 is greater or equal to threshold
Then they form same interest matched group so N1 and N2 are grouped.
Case2: Node N2 is already a member and N1 calculates the similarity between it and cluster C,If similarity is greater than threshold and node meeting frequency is more then N1 is given membership to that.

C. Node Role Assignment
We characterize group organizer and representative hubs in the perspective of an informal organization. A group facilitator is an imperative and prevalent hub in the group. It keeps records of all documents in its group. Every group has one diplomat for each known remote group, which serves as the extension to the group. The organizer in a group keeps up the vC of remote groups and relating diplomats with a specific end goal to guide inquiries to representatives for between group seeking. The quantity of ministers and organizers can be balanced in view of the system size and workload with a specific end goal to abstain from over-burdening these hubs. Since diplomats and facilitators assume more liability, we can likewise receive part pivot and additional motivators for decency thought. In this hub part task we have two hub determinations. They are

1. Community Coordinator Node Selection
2. Community Ambassador Node Selection

Community Coordinator Features

- Important node in that community.
- Keeps all index of all files of yhat community.
- It maintains vector of Ambassador and foreign community so as to forward queries.
  How to choose a community coordinator?
- It should be stable.
- Should have tight exchange frequency with additional community members.
- Centrality should also be considered.
- Calculates degree centrality.
- Every node checks it degree uniqueness and broad caste to other nodes.
- If node degree centrality is not more than it of other nodes then it will be treated as community coordinator.

Community Ambassador Features

- Bridges coordinator in home and foreign community.
- It has more mobility between networks.

  How to select the community Ambassador?

- Use product of nodes contact frequency with home coordinator and foreign community.
- Based on meeting frequency the ambassador will be selected for each community.
- If a node has more overall contact frequency with all communities which is also called as Default Ambassador.

ALGORITHM: Node functionality assignment
Step1: Start
Step2: Each node reports its utility value (contact frequency) to coordinator.
Step3: Based on highest utility value the coordinator allocates Ambassadors for each community.
Step4: Select default Ambassadors.
Step5: If Ambassador loses connection
Go to step2.
Else
Go to step6
Step6: Carry on the file sharing using Ambassadors with foreign community.

D. Feature oriented routing algorithm

- Each nodes maintain history vectors –It is a record of interest keywords that is encountered
- When 2 nodes meets for communication they exchange and update history vectors
- Each nodes uses fitness scores- neighbor's probability to be or to meet file holder
- When node receives a message then the neighbor has highest fitness than itself and it forwards to neighbor
- This will be continued till it reaches destination.

IV Results and discussion
The simulation was conducted using NS2 simulator and various parameters like packet drop, total cost, performance characteristics have been plotted comparing with MOPS.

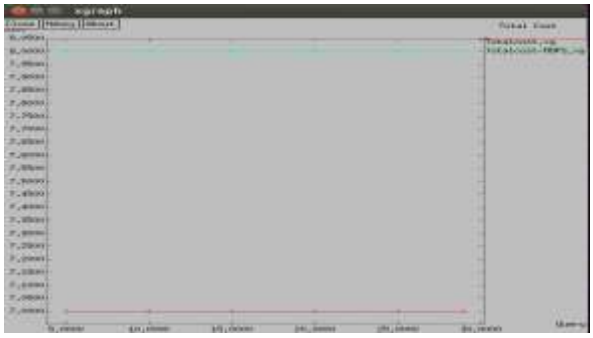

Fig 4.1: Total Cost Graph

According to the simulation conducted the total cost of PCFM is less compared to the existing MOPS shown in Fig 4.1.

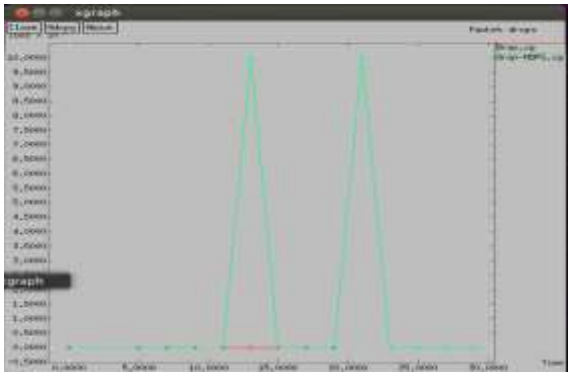

Fig 4.2: Packet Drop Graph

According to the simulation conducted the Packet Drops using PCFM approach is less compared to the existing MOPS which is represented in Fig 4.2.

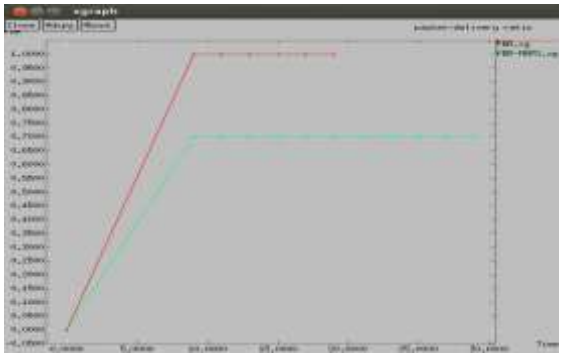

Fig 4.3: Packet Delivery Ratio Graph

According to the simulation conducted the Packet Delivery Ratio using PCFM approach is more compared to the existing MOPS shown in Fig 4.3.

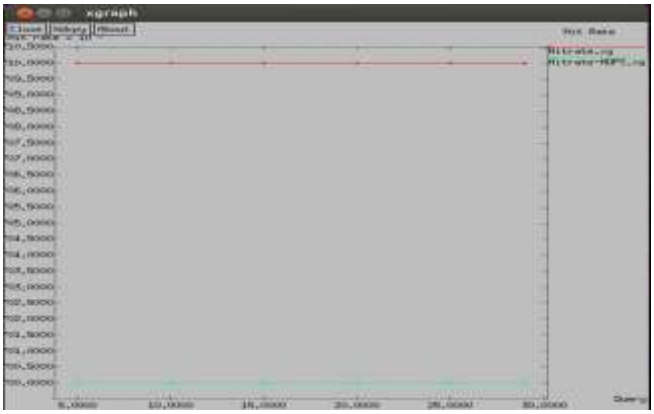

Fig 4.4: Hit Rate Graph

According to the simulation conducted the Hit Rate using PCFM approach is more compared to the existing MOPS as shown in Fig 4.4.

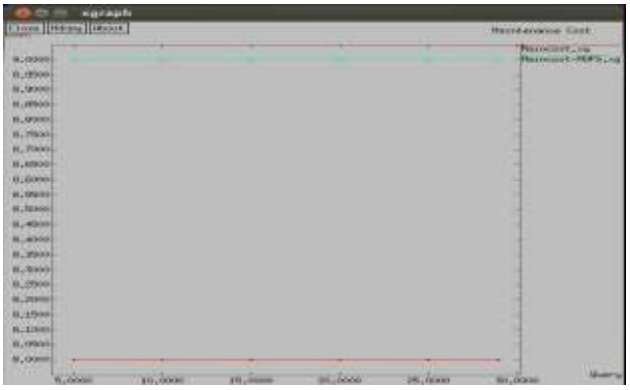

Fig 4.5: Maintenance Cost Graph

According to the simulation conducted the Maintenance cost of PCFM is less compared to the existing MOPS shown in Fig 4.5.

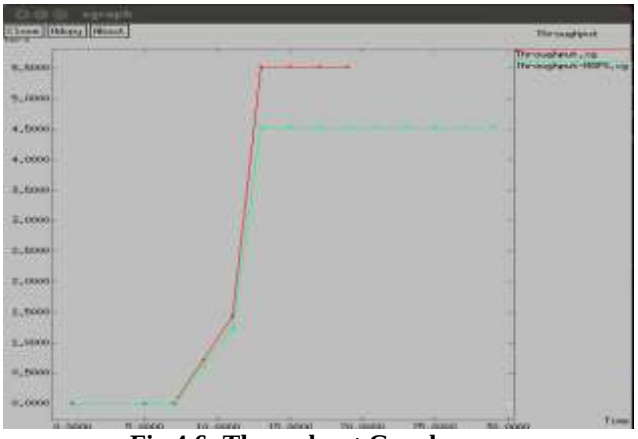

Fig 4.6: Throughput Graph

According to the simulation conducted the throughput of PCFM is more efficient performance compared to the existing MOPS specified in Fig 4.6.

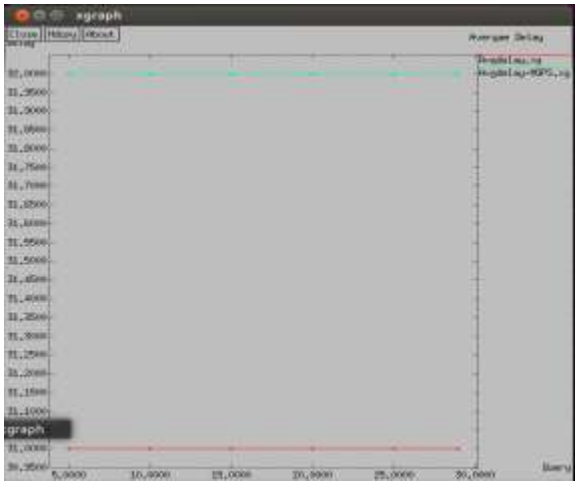

Fig 4.7: Average Delay Graph

The delay encountered while retrieval of queries and data is very less in the PCFM approach than in the MOPS as indicated in Fig 4.7

V. Conclusion & Future Enhancements

In this paper, a novel social network-based Peer to Peer content and context based FSS in Mobile Ubiquitous Networks is proposed. PCFM reflects both node features and occurrence of meeting for efficient and effective file sharing. There are 4 main components of PCFM is introduced: Feature extraction identifies nodes' properties or features; cluster creation builds same-feature nodes with maximum frequent meetings into different groups. The node responsibility assignment module exploits nodes with maximum association with its group members for communication between different communities or intra-community data querying and most fast mobile nodes that visit outer communities oftenly for intercommunity file searching; The interest-oriented document recovery plan chooses sending hubs for inquiries in view of interest similitude. PCFM also includes further more strategies for prefetching of the file, completion of queries, and prevention of loops, and churning of node consideration to further improve file retrieval or searching efficiency. The system execution on the real-world NS2 platform and the simulation conducted against the existing MOPS prove the efficiency of PCFM .In future exploration is done as in what way to identify appropriate beginnings in PCFM, how they affect the efficiency of data sharing, and how to adjust PCFM to bigger and more systems which are disconnected.

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