



FILE SEARCHING IN OPPORTUNISTIC NETWORKS BASED ON INTEREST CASTING

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Abstract— The Peer-peer file contribution model makes significant networks as a substitute of an annoyance, wherein nodes share files directly with each other without a centralized server. The unbeaten deployment of file sharing system in MANETs make the Peer-Peer file sharing over MANET is a capable set off to current infrastructure model to comprehend pervasive file sharing for mobile users. The mobile phones are carried by and large be in certain social relationships, focus on the Peer-Peer file sharing in a disconnected MANET community consisting of mobile users throughout social network properties. In file sharing system, nodes meet and exchange requests and files in the format of text and images in different interest categories. For efficient file searching, our system group's common-interest nodes that frequently meet as communities. In this work, The IRA algorithm is used for frequent contact with community members as community coordinators for intra-community searching and highly-mobile nodes that visit other communities frequently as community ambassadors for inter-community searching.

Index Terms— IRA algorithm, intra-community, inter-community.

I. INTRODUCTION

A mobile ad-hoc network is a group of mobile nodes forming an ad-hoc network absent of any centralized configuration. These networks introduced a new art of network concern and be capable of well suited for an environment where either the infrastructure is lost or where position an infrastructure is not very cost effective. However in this case, the nodes are limited to throw and get information but do not route whatever thing across the network.

Mobile ad-hoc networks can work in an unrelated fashion or could probably be related to a well-built network such as the Internet. MANET can turn the vision of exploit connected wherever and at all time into truth. Not clear to specific situations, these networks may regularly explain better performance in other places.

Classic application example includes a ruin recovery or an armed operation. Illustration of that, can envision a set of peoples with mobile and laptops, in a commerce convention at a position where no network services is present. They can simply set-up their tackle by forming an ad-hoc network.

These networks may probably be used and is one of the examples. Therefore, real-world researches are highly required for MANET application to become truth, in spite of their high costs (in terms of time to set up) and essential boundaries (number of nodes). In addition, a small number of efforts have been committed by researchers to create application that make use of the very description of ad hoc networks, and could thus be mostly helpful to MANET user.

The research has been carried out to consider presentation of networking protocols in segregation, exclusive of considering reasonable application to be run on top of them. By means of leveraging the self-organizing nature of MANETs, Group-Communication Applications can be a stupendous opportunity from this perspective.

Group-Communication Applications can highly promote from a networking environment like MANETs, in which networks can be set-up and frayed down completely on claim, without require any pre-existing infrastructure. So, every node in MANET is treated as a router.

- Quickly deployable, self configuring
- No need for presented infrastructure.
- Wireless links.
- Network topology can be very dynamic because nodes are mobile.
- MANET can be linked with external network or it can be standalone network.

The following four components are made in the proposed work:

1. An interest extraction algorithm is proposed to derive a node's interests from its files. The interests facilitate query in content-based file sharing.
2. The Group of nodes that share prevalent interests and meet recurrently as a community. In which a node has high probability to find interested files in its community. A node can rely on nodes that frequently travel to other communities for file searching if the searching file does not exist. Thus, the community construction algorithm is used to build communities to enable efficient file retrieval.
3. Node role assignment algorithm that takes advantage of node mobility for efficient file searching. It designates a constant node that has the tightest relations with others in its community



as the community coordinator to guide intra-community searching. For each known alien community, a node that often travels to it is designated as the community ambassador for inter-community searching.

4. An interest-oriented file searching and retrieval method are used that utilize an interest-oriented routing algorithm (IRA) and above three components.

II. LITERATURE SURVEY

End-to-end communication in which concurrent paths among the end points are not available, i.e., multihop ad hoc networks are used data distribution in resource-constrained opportunistic networks. If interested users are present in the regions of the network have to make content available for them, without overusing available resources that is main challenge in [1]. The social oriented policies are identified as Most Likely Next [1]. MLN overlooks possible long path multi-hop "social paths" across communities, while Future does not.

People Net [2] is used for proficient information search in a disseminated approach. It uses the infrastructure to propagate queries for user to specific geographic locations of a given type, called bazaars. The query is promoted to propagate between neighboring nodes via p2p connectivity until it discovers a matching query within each bazaar. Three metrics are affected the key performance of the system (People Net) [2] (i) Probability of a match, (ii) time to find a match and (iii) number of matches found by a query.

A fully decentralized approach [3] is recommended for new contacts in the social network of mobile phone users. It doesn't assumed any centralized coordination in the application which means the information of the mobile users has been collected and processed as transparently such as the list of contacts and log of calls. Privacy issues [3] are raised when the available information of the mobile users that is processed as transparently.

Small talk [4] is a social lubricant that helps to people to initiate conversations and make friends with each other in physical proximity. E-Small Talker, a distributed mobile communications system that make easy social networking in physical proximity.

SDP [4] protocol is used to exchange no service related information not been any connection. IBF [4] protocol been used for encode the topics to fit in SDP attributes that gives the main issue such as low positive rate when the connection are established between the mobile users. Experiments and results analysis [4] are not easing in social interaction in physical proximity.

MobiClique [5] is a social networking middleware which is making to distributed content

using store-carry-forward technique. The main complex of this is, need for central server to content exchange. API [5] is encouraging the third-party application development. Short-comings have been arises when deploying and designing similar system.

FindU [6] that makes to find the best matches among the group of user by initiating users there is a risk to limit the privacy of the participating users in social networking. Private attributes [6] are affected of the participating users. Secure Multi party computations (SMC) [6] that protocol arises the main issues when two of the users are been participated in social networking to find their best matches at their privacy levels [6] are affected such as personal information.

SANE protocol [7] that validate on the real world traces that individual the similar interest users among the group of users. The experimental result [7] doesn't show clear forwarding of information among the users. It provides less performance when the degree of connection among similar interest profile and pair wise meeting rate is unassuming.

Secure Function Evaluation (SFE) [8] is a paradigm which comprises a high-level-procedural definition language (SFDL) the main challenges of this is that support one-pass Boolean circuit [8], i.e., the network and processor run in parallel one party has to wait idle for the other one to finish their job it affect the overall performance of the system.

SMC protocol [9] determines which of the two natural numbers are greater. The solution doesn't work if the numbers are real. The networks are constructed based on symmetric cryptography and that protocols are private. The solution [9] of the symmetric cryptography has great disadvantages based on the public cryptography.

Mobilefairplay [10] uses secure two party protocols where parties are often requested to exchange sensitive information such as contact, interest profile to optimize the network operations. The running time [10] is very lower and negligible as computational and communication power of smart phones decreased.

III. SYSTEM MODEL

System model consist of the architecture diagram of the entire work. This explains clearly what the proposed work is.

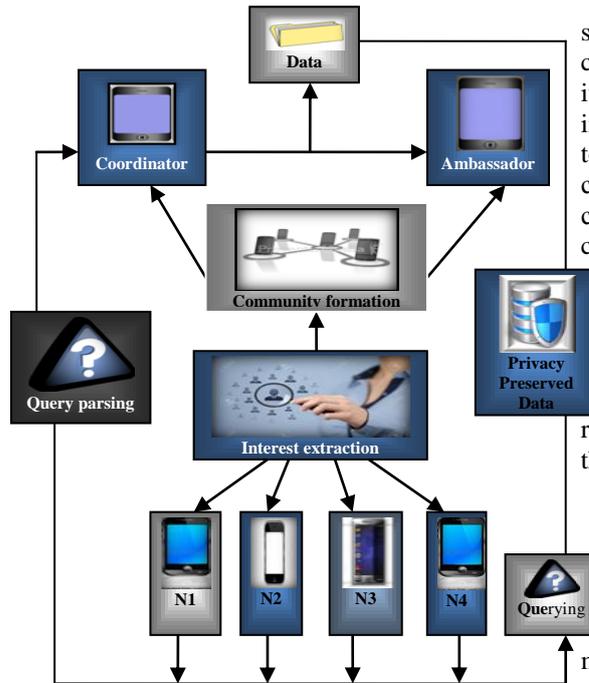


Figure 1: System design

Community formation

The community is formed here for efficient file searching. First, derive a node's interests from its files. Set of nodes are group as a community in which a node having high probability to find interested files in its community that share common interest files among them. The probability of similar interested nodes meeting together and sharing is high. But the query is not processing the node can rely on nodes that often travel to other communities for file searching.

Ambassador and coordinator

The community coordinator and ambassador nodes are assigning in the social network. In community, the community coordinator has a significant role. The index of all files is kept in it. There must being one ambassador for each known distant community, which serve as the bridge to the other community. The foreign communities maintained by coordinator in a community and consequently ambassadors that map queries to ambassadors of distant community for inter-community searching. The network size is dynamic based number of coordinator and ambassador and workload that avoid overloading these nodes. the more responsibilities are been to ambassador and coordinator in community.

Query processing

Two steps are there in interest oriented file searching scheme: Intra- Community and Inter-community searching. A node first searches files in its own community. The queries are launched for inter-community searching and forwards the request to an ambassador it will pass to the distant community that matches the request's interest if the coordinator doesn't satisfy the requests in home community. A request is deleted when its TTL (Time Live) expires. During the search, a node sends a message to another node using the interest-oriented routing algorithm (IRA), in which a message is always forwarded to the node that is likely to hold or meet the queried keywords. If the route expires, the retrieved file is routed along the search path or through IRA.

IV. METHODOLOGY USED

The following are the algorithm used to manipulate the content of the mobile node in community based on their interest..

Interest routing algorithm: This section describes on how the query is processed and the data is retrieved from the files of the mobile node based in the community constructed on the condition of it.

Intra-community File searching: Each query is related with count to indicate the number of nodes it will travel.

After each forwarding of query the count is decremented by one. The query is sent to the destination that is represented by coordinator.

Algorithm1: Interest routing algorithm for intra-community file searching for query Q performed by node N_i .

Procedure $\text{intraSearchForQ}()$

```

    If a neighbour nb of  $N_i$  matches query Q
    then
         $N_i.\text{sendQueryTo}(Q, nb)$ 
    Else if  $Q.\text{src} = N_i$  then
        If  $\text{Sim}(vQ; vC) < T_s$  then  $Q.V_{\text{dest}} = v_{NC}$ 
         $N_i.\text{sendThroughIRATo}(Q, NC)$ 
    else
         $Q.v_{\text{dest}} = vQ$ 
         $N_i.\text{rankNbByFitness}() \text{ overall} F^2 0$ 
        For each neighbour nb of node  $N_i$  do overall
        gets
             $\text{overall} F + F(Q; nb) N_i.\text{sendQueryTo}(Q, nb)$ 
        if  $\text{overall} > \beta$  then break
    else
    
```

```

if Q.hops<MaxHop then Q.vdestvQ
Ni.rankNbFitNess()
nBvthe neighbour with maximal fitness
Ni.sendqueryTo(Q,nb)
else
Q.vdestvNC Ni.sendThroughIRATo(Q,NC)
  
```

Inter-community file searching: In this, a community coordinator bridge the request to the nearest community this contain mostly queried file. It sends out a query to ambassadors which having most resemblance with the query to improve the competence of the forwarding.

Algorithm 2: Interest routing algorithm for inter-community file searching for query Q performed by node Ni.

```

Procedure interSearchForQ ( )
if Ni is a Coordinator then
    bContainv Ni.checkContainFile(Q)if
bContain
    Ni.sendQueryToDes(Q)
Else
    Ni.rankAmByMatch()overallS0
    For each ambassador NA of Ni's community
do
    n.sendQueryTo(q,NA)overall S + Sim
    (q:VQ.NA.VC)if overallS>α break
If Ni is an ambassador then when Ni meets another
node Nj
If Nj.homeCommunity=Ni.foreignCommunity then
Ni.sendQueryTo(Q,Nj)
Nj.sendThroughIRATo(Q,NC).
  
```

V. EXPERIMENTAL RESULTS AND DISCUSSIONS

The proposed system is evaluated using JAVA FX and MYSQL. Form the virtual environment using JAVA FX.

First, classify nodes contain similar interests and frequent contacts into a community to facilitate interest-based file searching using by interest extraction algorithm. A node is created by giving the input of its distance and mobility by users.



Figure 2: Interest Extraction

Here, Nodes that contain related type of keywords based on a particular field are characterized as a community. Consider a node which has the highest probable category as its community that one file belong to different category. Here, allocate the coordinator and ambassador role to a node based on its mobility. This can change as a result based on the available nodes at there.

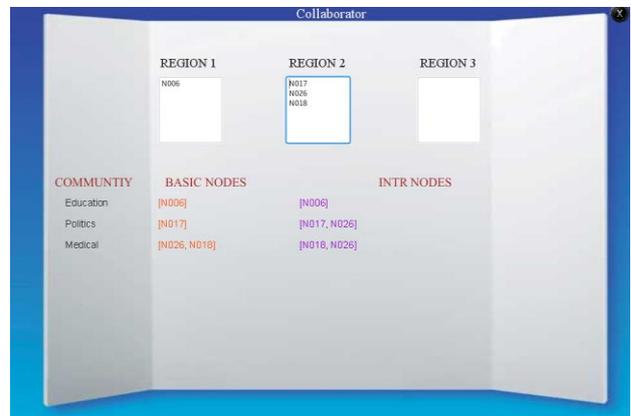


Figure 3: Community formation

The query is passed to the coordinator of its community. If the file is finding by the coordinator within its community, the file is getting back to the demand node. Else, the query is forwarded to the ambassador of the community.



completion of queries and prevention of loops and node churn consideration to further enhance file searching efficiency.

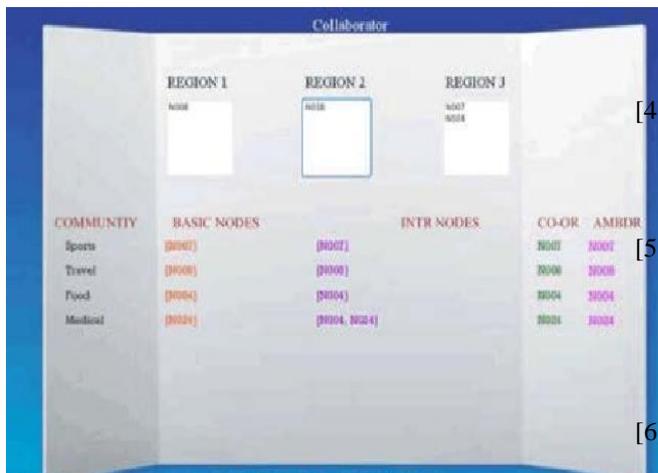
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Figure 4: Content of the file

The ambassador looks for the similar files based on the keywords given in nearest communities. If it finds the file, it is retrieved back to the requested node.

The user node that has requested can either save or view the file which it has requested. The query has been fails after retries if the ambassador and coordinator couldn't find the requested file.



COMMUNITY	BASIC NODES	INTR NODES	CO-OR	AMBIR
Sports	(1007)	(1007)	1007	1007
Trend	(1008)	(1008)	1008	1008
Food	(1004)	(1004)	1004	1004
Medical	(1004)	(1004, 1004)	1004	1004

Figure 5: Retrieve file

VI. CONCLUSION

A Social network based content file searching system is implemented in disconnected mobile ad hoc Networks that considers both node interest and contact frequency for efficient file searching. Four main components are: Interest extraction identifies nodes' interests; Community construction builds common-interest nodes with repeated contacts into communities.

The node role assignment component enlarge nodes with stretched link with community members for intra-community file searching and highly mobile nodes that visit exterior communities often for inter-community file searching; the interest-oriented file searching scheme select cheeky nodes for queries based on interest resemblance. This system can also add in additional strategies for file prefetching,



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