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UNSTRUCTURED NODE COMMUNICATION FOR NEXT GENERATION WIRELESS MOBILE NETWORKS

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Abstract:
In this paper, we proposes unstructured communication architecture for next generation data services in mobile communication. It provide user-to-user interface through which users can send request to another user with an hybrid protocol in an unstructured communication architecture. In this architecture user will keep the record of nearby users in data set, while searching a particular user, it will check for matches against their local data set, and respond with applicable results. Due to its unstructured nature a network of users will implements robust operation. Network will not be interrupted if a user goes offline.

Keywords:
Unstructured communication, resource utilization, data, internetworking, LMA.

I. INTRODUCTION

Rapid advances in wireless and mobile network technologies and mobile handsets facilitate ubiquitous infrastructure that can support a range of mobile services. The Mobile IP protocol has been designed to address the problem of roaming between IP networks. However, as a mobile node moves between networks, the signaling overhead causes significant disruption to real time data traffic by introducing the concept of Local Mobility Agent (LMA). Disadvantages of LMA is when the mobile node changes access network and registers the new care of address at LMA, shorter signaling delay can be expected when a nearer LMA is selected. If the mobile node is communicating with any correspondent node during this interval, the registration delay can be translated into packet loss [1]-[2].
Unstructured communication architecture is a decentralized user-to-user system. It allows the participants to share resources from their system for others, and locate resources shared by others on the network. Each participant launches a program, which will seek out other nodes to which to connect. This set of connected nodes carries the traffic, which is essentially made of queries, replies to those queries, and also other control messages to facilitate the discovery of other nodes. Users interact with the nodes by supplying them with the list of resources they wish to share on the network, can enter searches for others resources, will hopefully get results from those searches, and can then select those resources amongst the results. But one can imagine other types of resources that, once fetched, will bring more than their content value. Unstructured communication eliminates LMA; instead, it provides user-to-user connectivity by keeping the record of nearby users, as it will not require base station or any server.

II. RELATED WORK AND PROBLEM STATEMENT

There are many search algorithms for unstructured communication networks, which comes under two different strategies.
First is blind search in which it satisfies the request by propagating the query to a sufficient no. of nodes. Blind search protocol is simple and requires user device to maintain a minimum amount of knowledge about network organization. Second is informed search where it utilizes information about location of user device and decides which device should be connected [3]. Blind Search Methods are 1) Gnutella algorithm which uses flooding and results in large amount of query messages. 2) Modified BFS (Breath First Search) algorithm is variation of flooding scheme, which reduces average message

production. 3) Interactive Deepening is based on BFS (Breath First Search) which produces bigger load than flooding.

4) Random Walks is unable to adopt to different query load. It only sends query messages to number of randomly chosen neighbors [4][5]. 5) Guess, this algorithm builds upon notion of ultra-peers. In this algorithm the order with which ultra-peers are chosen is not specified. 6) Gnutella2 rely on dynamic hierarchical structure, which is based on hybrid network.

Second is Informed Search Methods, which are further classified as 1), Intelligent BFS is an informed version of modified BFS. Nodes stores query-neighbor ID for recently answered requests from their neighbors in order to rank them. It shows no easy adaptation because it does not use negative feedback.[5] 2) In APS (Adaptive probabilistic Search) node keeps a local index consisting of one entry for each object it has requested per neighbor[6]. 3) Local Indices (LI): Each node indexes the objects stored at all nodes within a certain radius and can answer on behalf of all of them.4) Routing Indices: Each node stores an approximate number of documents from every category that can be retrieved through each outgoing link.

New approaches: Small-world (SW) network has two properties low diameter and high clustering coefficient which is required by large scale peer-to-peer networks. Small world network is based on decentralized hierarchical model [7]. New heuristic chaining algorithms are developed for backward, forward, and bidirectional discovery of trust chains. This type of system improves search time and chaining accuracy [8]. Heuristic trust chaining algorithms has high search cost. To improve search efficiency and reduce the network load dynamic topology adaption is used. In this method query forwarding is done by TTL (Time to live) which has limited flooding mechanism [9]. Dynamic search algorithm uses two different algorithms to implement unstructured peer-to-peer networks. Flooding for short term search and RW (Random Walk) for short term search which improves search time and search efficiency. To improve its performance it should be combined with knowledge based algorithms [10][11].

By eliminating LMA in the unstructured communication architecture user node will records a database of nearby nodes by sending a request in response to that other nodes will provide response as information.

Objective of research is to develop unstructured architecture for data services in mobile communication. It provides user to user connectivity by keeping the record of nearby users, as it will not require master device or any server. This architecture allows the participants to share resources from their system for others, and locate resources shared by others on the network. Each participant launches a program, which will seek out other nodes to which to connect. This set of connected nodes carries the traffic, which is essentially made of queries, replies to those queries, and also other control messages to facilitate the discovery of other nodes.

III. ARCHITECTURE

No fixed architecture because users are mobile users. Figure 1 illustrates the example of unstructured communication architecture for next generation data services in mobile communication. eg. User A will communicate to user K.

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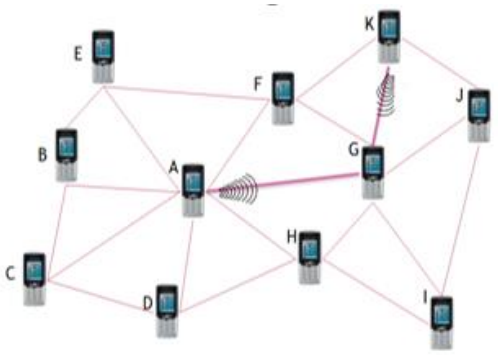

Fig.1 Example of Unstructured Communication Architecture for eleven mobile users

Figure.1 illustrates the example of unstructured communication architecture for eleven mobile users. To envision how this will work, we have considered a large circle of mobile users; each mobile user will keep record of its nearby user including pre-existing list of possibly working users. Chances are at least one node (eg. B) Will work. Once it has connected, node B will send node A its own list of working nodes. Node A will try to connect to the nodes it was shipped with, as well as nodes it receives from other nodes, until it reaches a certain quota, usually user-specifiable. It will only connect to that many nodes, but it keeps the nodes it has not yet tried. Now, when user A wants to do a search, it sends the request to each user it is actively connected to. It is possible that some of them will no longer work, in which case user A tries to connect to the users it has saved as backups. The number of actively connected nodes for user A forwards the request to all the nodes it is connected to, and they in turn forward the request, and so on. In theory, the request will eventually find its way to every user on the network. When user A disconnects, the software will saves the list of nodes that it was actively connected to, and that it will keep as a backup, for use next time it connects. The real benefit of having such decentralized is to make it very difficult to shut the network down. Unlike cellular system here the entire network relied on the (Mobile Telephone Switching Office) MTSO. This Network cannot be shut down by shutting down any one user. In this architecture peers arrive and leave dynamically [12]. The real benefit of having such decentralized network is to make it very difficult to shut the network down. Unlike centralized system where the entire network relied on the server, if server fails entire network fails [13]-[14]. Several mobility prediction algorithms have been proposed for wireless networks [15]-[16]. Most algorithms make use of a history base that has a record of the previous movements of users. Taking into account the probability of user movements, regular movements of users can be predicted fairly [17]-[18].

Request: Used to actively discover users on the network.

Response: The response to a Request includes the address and location of a connected users.

IV. ALGORITHM

Below is a algorithm for communication between user to user:

Step-1: User A will Send a request to connect to user K

Step 2: Request is received by user B, C, D, E, F and user G

Step-3: User F, user G and user H will again sends request to find user K

Step 4: User F and G found to user k and send request to user K the connect user A

Step 5: User K will respond through user G or H depending upon shortest path

Step 6: but the other user in that network will provide information and keep information in their own database of nearby users.

Table 1 : Node addressing of wireless network module

00					Master Node (00)
01	02	03	04	05	1st level children of master (00)

011	021		031	012		013	014		015	2nd level children of master. Children of 1st level.
111	121	221	331	112	212	113	114	214	115	3rd level children of master. Children of 2nd level.
1111	1121	1221	1331	1112	1212	1113	1114	1214	1115	4th level children of master. Children of 3rd level.

Our initial work attempts simulation to compare the performance of unstructured architecture for data services in mobile communication. Several mobility prediction algorithms have been proposed for wireless networks [12]-[13]. Most algorithms make use of a history base that has a record of the previous movements of users. Taking into account the probability of user movements; regular movements of users can be predicted fairly [14]-[15].

In this architecture peers arrive and leave dynamically. This system is strongly decentralized which means there is no central server. The real benefit of having such decentralized network is to make it very difficult to shut the network down. Unlike centralized system where the entire network relied on the server, if server fails entire network fails.

Node addressing

Node 00 is the base node.

Nodes 01-11 are nodes whose parent is the base.

Node 021 is the second child of node 01.

Node 0321 is the third child of node 021, and so on.

The largest node address is 05555, so 3125 nodes are allowed on a single channel. An example topology is shown in table no. 2, with 5 nodes in direct communication with the master node, and multiple leaf nodes spread out at a distance, using intermediate nodes to reach other nodes.

No fixed architecture because users are mobile users. It provide user to user interface through which users can send request to another user. Each peer keeps a record of other peer and picks its neighbors from its records. The record is populated by the address of peers that answered previous queries. The records are obtained through intuition rather than observation. It is therefore reasonable to expect that this process lead to the formation of communities of user. The exact process by which point-to-point networks are formed is largely unknown and thus peer clustering is at this point only hypothesis. But, we believe that it is a fair hypothesis based both on our practical experience with point-to-point systems, and on the observation that most network grows in a decentralized way exhibit strong clustering properties. Due to its unstructured architecture a user of the network goes offline network will not be interrupted.

V. RESULTS AND DISCUSSION

No fixed architecture because users are mobile users. It provide user to user interface through which users can send request to another user. Each peer keeps a record of other peer and picks its neighbors from its records. The record is populated by the address of peers that answered previous queries. The records are obtained through intuition rather than observation. It is therefore reasonable to expect that this process lead to the formation of communities of user. The exact process by which point-to-point networks are formed is largely unknown and thus peer clustering is at this point only hypothesis.

But, we believe that it is a fair hypothesis based both on our practical experience with point-to-point systems, and on the observation that most network grows in a decentralized way exhibit strong clustering properties. Due to its unstructured architecture a user of the network goes offline network will not be interrupted.

The main advantage of unstructured communication architecture is a decentralized user to user system. It allows the participants to share resources from their system for others, and locate resources shared

by others on the network. Each participant launches a program, which will seek out other nodes to which to connect. This set of connected nodes carries the traffic, which is essentially made of queries, replies to those queries, and also other control messages to facilitate the discovery of other nodes. Users interact with the nodes by supplying them with the list of resources they wish to share on the network, can enter searches for others' resources, will hopefully get results from those searches, and can then select those resources amongst the results. But one can imagine other types of resources that, once fetched, will bring more than their content value

Table 2: Parameters considered for architecture design

Sr. No.	Parameter	Details
1	Node sequence no.	06 nodes (Wireless module nRF24L01)
2	Field size	80 meters (extends as per Mesh network nodes move)
3	Protocol details	Proactive and Reactive
4	Routing table unit	YES
5	Sleep and wake up unit	No (Unstructured Architecture)
6	Delay	Round trip delay 24 m sec

Cellular network operators worldwide have recognized the benefits, there is a strong need to develop architectures that can provide internetworking between users. First it is clear that communication will play a grater role in society in future. Second, it is apparent that a wider diversity of applications will exist. Third, the major technology trends that will influence the role and number of subscribers that are using the mobile communication technology. Fourth conclusion is that in unstructured communication architecture provides free data sharing. Compared to other micro-mobility management approaches, this proposal is also more scalable to support large number of mobile nodes.

VI. References

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