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## Development of Unstructured Architecture for Voice and Data Services in Mobile Communication

Ms. Aarti R. Salunke<sup>a</sup> Dr. A. N. Gaikwad<sup>b</sup> \*

<sup>a</sup>Department of Electronics and Telecommunication, JNEC, N-6, CIDCO, Aurangabad 431001, MH, India

<sup>b</sup>Zeal Education Society, Dnyanganga College of Engg. and Research, Narhe, Pune 41104, MH, India

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### Abstract

The huge popularity of voice and data services in mobile communication facilitates ubiquitous infrastructure that has been mainly driven by the scalability of their architectures and the flexibility of their search facilities. Such systems are usually designed as unstructured point-to-point networks and support highly versatile search algorithms.

Developing search algorithms is difficult in unstructured peer-to-peer networks. Flooding and Random Walk are two typical search algorithms. Flooding covers most of the nodes by searching randomly. In the unstructured network peers are interconnected randomly, they rely on Flooding query messages to discover objects of interest. It generates a large amount of query messages which produces network traffic. Random walk search algorithms are used in mobile networks because of their dynamic nature. But it only generates a fixed amount of query messages at each peer but would take longer search time. Thus we propose development of unstructured architecture for voice and data services in mobile communication. In this architecture we are focusing on interconnection of various mobile devices. One way is to improve the algorithm for selecting path, second way to modify the routing algorithm by considering new characteristics for less signaling overhead.

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\* Corresponding author. Tel.: +0-000-000-0000 ; fax: +0-000-000-0000 .  
E-mail address: [author@institute.xxx](mailto:author@institute.xxx)

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## 1. Introduction

Several mobility prediction algorithms have been proposed for wireless networks [1]. 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 [3][4]. In this system we propose unstructured communication architecture which is a decentralized point to point system. It allows the user 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 search of other nodes. In proactive routing protocol more routing overhead problem and in reactive routing protocol large amount of query messages which produces network traffic and delay[3]. Recently, random walks have been proposed as primary algorithmic ingredients in protocols addressing searching and topology maintenance of unstructured networks. [4]. 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[2]. Due to its unstructured architecture a user of the network goes offline network will not be interrupted.

## 2. Architecture

In unstructured ad hoc mobile networks, each mobile device does not have all the information about whole topology and the location of queried resources. Because of the dynamic properties of unstructured mobile networks difficult to capture global behavior of mobile devices [1]. As the mobile devices participating in unstructured networks interconnect randomly, they rely on flooding query messages to discover devices of interest and thus produce large network traffic [2][3].

Fig. 1 Illustrates the example of unstructured communication architecture for voice and data services in mobile communication.

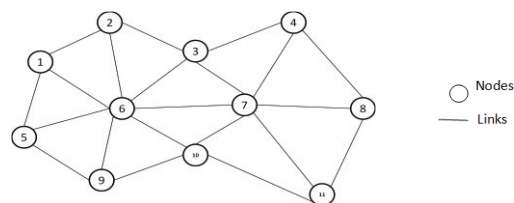


Fig. 1. Example of unstructured architecture

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

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