

# HANDLING MOBILE HANDOVER IN SPATIALLY DISTRIBUTED WORKGROUPS WITH DIGITAL INTERACTIVE MAPS

N.Palanisamy, Dr.V.Murali Bhaskaran

## Abstract

With the growing trends of mobile enabled applications, people in a workgroup tend to work collaboratively even though they are spatially distributed. To enable collaborative working in a spatially distributed environment on the fly, this paper proposes a handover methodology to operate the functions in collaborative environment efficiently. The workgroup people can access the services in the spatially distributed environment to perform their work tasks while they are moving, at this stage they may be moving through different networks. Moving from network to other network is performed by hand shake procedure and it is initiated by the mobile node, according to speed and signal strength the mobile node takes the decision of moving to other network or stay in home network. Unlike other handover methodologies in distributed environment, the decision here is on the hands of mobile nodes.

## Index Terms:

Mobility Handling, Collaborative work groups, Interactive maps, location tracking, spatial distribution.



## 1. INTRODUCTION

Internet Protocol technology is incrementally used for various services like video conferencing and speech and data transfer, etc. The technology adopts for collaborative working in a spatially distributed environment. Handover is an activity at the top layer of the network protocol and happens as inter domain and intra domain. There exists various handover methodologies for various applications but this consider the hand over in spatially distributed network, where the collaborative work has to be done.

In Collaborative spatial distributed environments, the mobile nodes attached to network and moves towards some other network. The growing rate of mobile applications generates the demand for the services to access from anywhere through the Internet. The organizations have various rolls as CEO, Managers and Supervisors, each have various access controls and works to do with in a collaborative environment. The CEO can perform many operations through the Internet and access many services apart from location. Accessing those services through the

interactive maps are provided in this application. Providing the access to the services while they are moving is a big target and managing the continuity of the service availability is a challenging one.

When a mobile user moves from network to network the continuity of the service availability has to be taken care off. The mobile node initializes the handoff procedure as a three way handshake of TCP protocol and decides according to the signal strength and speed of the mobile nodes.

## 2. RELATED WORK

Inter-domain and intra domain handover is a recent research topic in industries which provides various internet services. Faster handover is not provided in most mobile IP networks.

Since wireless LAN technologies provide link layer roaming, a mobile node can move around different points of attachment within the same network. However, in order to accommodate more users in a wider area, such a large service area must be divided into separate networks to localize user traffic just as conventional fixed IP networks

are sub netted according to the number of users. When each network has a different network address, however, each time a mobile node enters into another subnet, it must reconfigure its IP address, which disables continuous communications.

In Collaboration at rural [1] proposed a collaboration tool to support and catalyze the development of the rural communities in rural regions. It provides a flexible work centric collaborative platform.

The Peer to Peer Collaborative Working Environments over Mobile Ad-Hoc Networks aims to allow collaboration over mobile ad-hoc networks. Within its scope a middleware was developed that is extensible through plug-ins and allows collaborating without any present network infrastructure.

The in-context project aims to enable dynamic collaboration of knowledge workers in a number of different projects at the same time. Therefore, a very flexible form of collaboration and the spontaneous emerging of new teams with dynamic interaction have to be supported. New techniques and algorithms are explored in this project to allow for such kind of collaboration.

In "IP Mobility Support" provides IP level mobility to allow these mobile nodes to roam around wireless LANs without disrupting transport sessions. By locating a Foreign Agent (FA) in each wireless LAN, packets destined for the mobile node are forwarded via the Home Agent (HA) in the home network of the mobile node and the FA in the visited wireless LAN.

In 3GPP, Handover Requirements between UTRAN and GERAN or other Radio Systems , In Inter-PLMN the question of continuation is addressed and a handover methodology is discussed where the mechanism allowing continuation of a call when moving from the coverage area of one mobile network into the coverage area of a different network is called "inter-PLMN handover"..

"IEEE Trial-Use Recommended Practice for Multi-Vendor Access Point Interoperability via an Inter-Access Point Protocol across Distribution Systems Supporting IEEE 802.11 Operation", standard defines the Inter-Access Point Protocol (IAPP) to support interoperability between WLAN access points (APs). The scope of 802.11F is limited to the intra-domain case, i.e. handover between WLANs of one network operator. Nevertheless approaches like

proactive caching mechanism where an AP sends context parameters to neighboring APs and the possibility that APs obtain information about one another are also valuable for inter-domain handover.

IETF SEAMOBLY Working Group was focusing on mobility over IP wireless infrastructure within one network domain. It proposed a technique to smoothen network layer handover by transferring the context information for a session from the current access router to the new access router in order to avoid setting up the states from scratch. All the methodologies discussed earlier suffer with the decision making and the decision is taken in the base stations side not from the side of mobile node. This paper aims to propose a new handoff methodology in which the decision making policy is on the hands of mobile nodes.

### 3. PROPOSED SYSTEM

The goal of this methodology is to provide a collaborative working platform, through which the location and task of the workers can be monitored and the workers can perform their tasks using the digital maps. The digital maps provide the location of the workers and work location to carry out the tasks. The digital maps get updated at regular interval, so that recent updates are received in time. The digital maps have many options to access various services, using which the user can carry out the tasks.

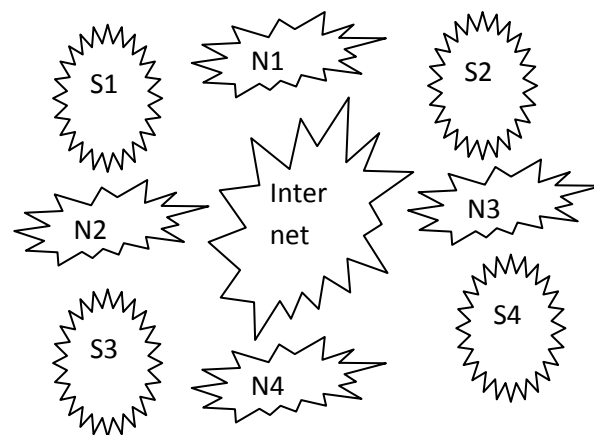


Fig 1.1 Collaborative Networks

The workers in the collaborative work group have various roles and responsibilities. For example the CEO can

watch a progress of the work going on and the supervisor can issue command to the workers. For example , a building construction work is going on in a collaborative mode, to carry out the task the CEO can watch what the progress and what the work is going on in the site. The Site Engineer can watch what part of the building they are constructing right now and he can issue command to the supervisor about composition of materials should be used to construct the part.

### 3.1 Map Updater

This enables the digital maps to be updated at regular interval and the location of the each user is tracked and updated. It provides interfaces to access different services, through which the work group members could do their tasks.

### 3.2 Mobility Handler

It initializes the mobility hand over procedure. It sends the hand over request to the base station towards which the mobile node moves. The base station sends the reply packet which contains channel strength and channel availability. Based on the signal strength and the channel availability and speed of the mobile, the mobile node decides whether to agree to the hand off and move to the next network or stay with the home network.

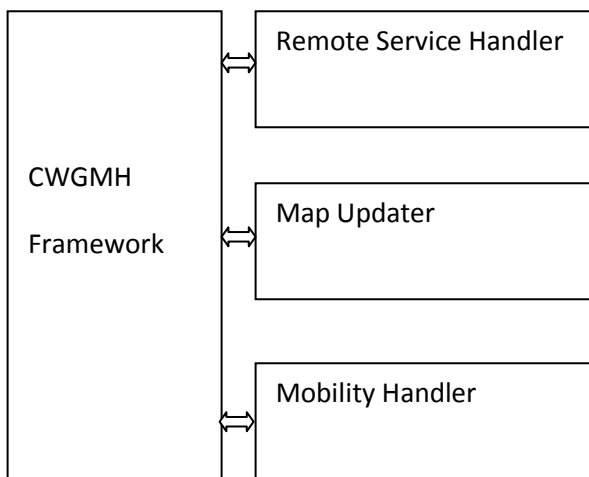


Fig 1.2 : System Architecture of Collaborative Workgroup with Mobility Handling.

### 3.3 REMOTE SERVICE HANDLING

The users of the framework enabled to access the remote services through the digital maps. At the time, the

user invokes the operation through the map, the remote service handler identifies the location of the service availability and sends a mobile agent to the location and invokes the service. The result of the service invocation is returned to the user.

## 4. CONCLUSION

Moving from network to other network is performed by hand shake procedure and it is initiated by the mobile node, according to speed and signal strength, the mobile node takes the decision of moving to other network or stay in home network. Unlike other handover methodologies in distributed environment, the decision here is on the hands of mobile nodes.

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1. Palanisamy.N is currently pursuing Ph.D program in Computer

*Science and engineering in Manonmaniam sundaranar  
University, Tirunelveli, India, PH-9677589265 E-mail:  
nps.palanisamy@gmail.com*

2. *Dr.V.Muralibhaskaran is currently Principal of Paavai College of  
Engineering, Pachal, Namakkal, India PH: 98423-34552.  
E-mail: **murali66@gmail.com***

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