



# INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

## MOBILE TELEPHONY COMMUNICATION THE USE AND ITS APPLICATION

R. C. VAIDYA, PROF. S.S. KULKARNI, S. S. SHEKAPURE

PRMIT & R Badnera

### Abstract

#### Accepted Date:

27/02/2013

#### Publish Date:

01/04/2013

#### Keywords

WIFI p2p,

AP,

Mobile telephony

The purpose of this paper is to design and implement a telephony program that uses Wi-Fi using Peer-to-Peer communication between mobile phones without any cost. The system will allow users to search for other individuals within the Wi-Fi range and to establish virtual connection through Access Points (AP) in case of unavailability of the mobile device in the same Wi-Fi, provide the normal telephony connection. In addition, we are using a novel algorithm. This algorithm always gives unique IP address for corresponding mobile number and vice versa. Thus, providing real feel of telecommunication without changing the behavior of user interface with the traditional mobile services. Further we are using SIP (Session Initiation Protocol) to create, modify and terminate multimedia sessions between two participants. This proposed paper will allow one call per connection, and no call waiting or conference calls.

#### Corresponding Author

Mr. R. C. Vaidya

## **1. INTRODUCTION**

The main objective of this paper is to present how Peer-to-Peer based services can be efficiently realized in next-generation mobile networks. Currently, GSM and IP service provider provides services over mobile phones but at cost. Servicing IP addressing in traditional networks are managed by two technologies such as DNS and DHCP. They try to reduce the cost for supporting these services over mobile phones. Two approaches are suggested in this paper to meet the objective of having free telephony services over mobile phones. These are the use of Wi-Fi technology over AP and Wi-Fi over p2p (peer-to-peer). In addition a novel algorithm has been invented to tackle the first fundamental problem of designing Ad hoc and p2p telephony using Wi-Fi, which will not rely on any central database, and will require users to register to any service. This can be achieved through executing an algorithm to map a mobile number to a unique IP address that can be used to establish p2p connection to any other mobile phone running the same algorithm. For converting mobile number into IP

address and vice versa. Here, IPv6 is used because IPv4 range is not sufficient for unique addresses.

The advances of VoIP and Internet telephony in general have come a long way since their inception. Most recently, the “next big thing” has been to merge Wi-Fi with VoIP, producing one of the oddest acronyms you’ll ever see. VoWiFi, or Voice over Wireless Fidelity, simply means a Wi-Fi based VoIP consists of the hardware and software that enables people to use the Internet as the transmission medium for telephone calls, VoWiFi is the wireless version of this technology that is designed to work on wireless devices such as a laptop or PDA. Some may wonder why a person or organization wouldn’t simply use a cell phone for mobile communications, but again business and organizations can take advantage of a decreased communications cost while having a mobile system that offers more reliable coverage indoors and higher voice quality than traditional cellular service with VoWiFi. Along with added benefits’ to business and those with a need for wireless communications, VoWiFi also opens up the door for a whole new market

of consumer products such as a standalone VoWiFi handheld. Many cellular phone companies such as Nokia and Motorola have already announced dual-mode cellular phones that will support seamless roaming from Wi-Fi to cellular networks when Wi-Fi is unavailable to a caller. That is one of the biggest challenges facing VoWiFi roaming access. A Wi-Fi access point offers a communication range up to 90 meters (commonly called a hotspot), and continuous conversations would mean that the caller must stay within an area of overlapping hotspots, or as already suggested, have a VoWiFi dual-mode phone that would switch to a regular cellular phone transmission when the caller moves out of a hot spot range.

Voice over Wi-Fi telephony is a challenging research topic. The system is transparent to the user, where a user needs only to dial the required phone number the same way of using the normal mobile phone. Following the mobile conversion to IPv6, the software applied at the mobile phone will try to establish p2p connection to the dialed mobile phone using the same algorithm. If no p2p connection can be

made, then the calling mobile phone will check virtual connection can be possible through AP using the same mechanism in p2p to establish communication channel with the called mobile phone. If no wireless connection using WIFI in between the 2 mobile phones, then a message would be displayed on the calling mobile phone notifying its user to proceed with the call using GSM technology or abort the call. The IP collision problem for mapping mobile to IP has been avoided since there is a unique mapping resulting in a unique IP for each mobile number. The work presented in this paper is a first step for developing a p2p voice to voice communication between 2 mobile users using the WIFI network which is based on 10 mobile digit numbers.

## **2. Voice over Wi-Fi (VoWiFi)**

The combination of Wireless and VoIP has led to the invention - VoWiFi technology. VoWiFi stands for Voice over Wireless Fidelity. Many people are choosing the freedom that is offered by VoIP. VoIP can offer nearly free or free long distance phone calls. Since VoWiFi operates from hotspot to hotspot or network-to-network,

you may think that there are roaming charges involved. There are no roaming charges involved with VoIP. So you can take your VoWiFi phone from hotspot to hotspot, maintaining your connection (provided you easily go from hotspot to hotspot) absolutely free.

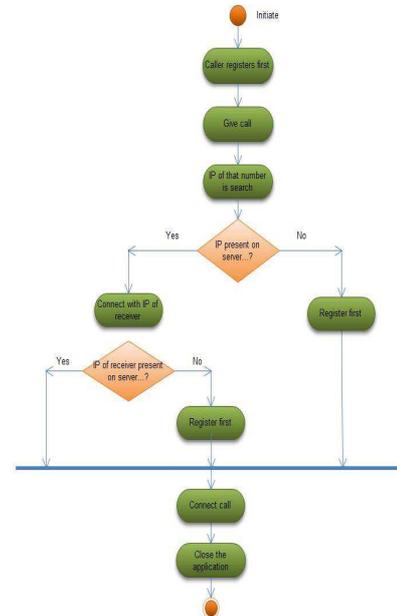
### 3. Function of VoWiFi System

#### Enable WIFI

When the WIFI supported mobile will come into WIFI region then we have to enable WIFI of that mobile. At that time IP address is generated from mobile number by using novel algorithm. That IP address is assigned to that mobile.

#### Call

When caller dials the number (mobile number of receiver), at that time IP address is generated from dialed number and the broad cast request for connection. As shown in below diagram



#### Search

For connection different searches are used. Initially caller mobile will search receiver mobile is present in WIFI region directly. If receiver is not found in that region then it will take the help of AP (access point). With the help of AP the caller mobile will search receiver mobile. If in both cases receiver mobile is not found then system provides GSM option for connection.

#### Display number on screen

When the receiver mobile is found then at receiver side source number is displayed on the screen with ring. That source number is generated from source IP address using

novel algorithm. Novel algorithm is used for convert mobile number into IP address and IP address into mobile number.

### Provide GSM option

If receiver mobile is not found within WIFI directly or with the help of AP then this new option is provided to the caller. This is provided for call as like the way of tradition call. In that call method charges are applied by GSM services provider. This option is enabled means receiver is not within the source's WIFI network.

### Connection

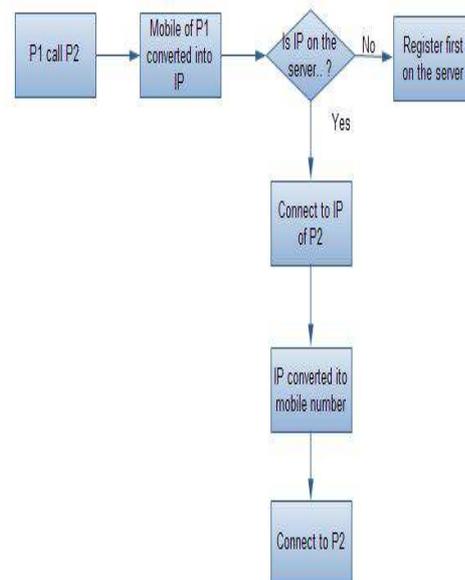
If receiver mobile is found to caller then number is displayed on the receiver screen then receiver mobile user has options like accept call or reject call. If he accept the call then the connection will established between caller and receiver mobile. If that connection within WIFI network then it is free of cost communication and if it is using GSM service then charges are applied by GSM service provider

### Reject Call

Reject call means break connection or avoid connection. When phone rings and call is rejected means connection is not established and when call is rejected while the communication is going on is the break in connection. Connection can be closed by either side as caller or receiver side.

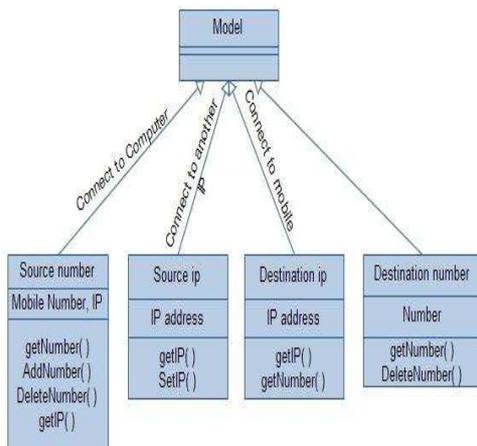
The above function work on the VoWiFi network

Which decide connection establishment the below flow diagram shows how to connection is establish between two host



On the above basis requires the IP mapping from Mobile Number to IP address and vice versa

These work shows in below flow diagram



Here we implement the novel algorithm for this system.

#### IV. Algorithm for mapping

There are two algorithms which are used to mapping between IP address and mobile number. For MobToIP (string number) input is mobile number and output is unique IP address and for IPToMob (string address) input is IP address and output is mobile number.

##### A. MobToIP (String mobile number)

Mobile number should be 10 digit integer and IP address 16 Hexadecimal integers. Conversion of mobile number to IP address is done by this algorithm. Steps of this algorithm are following:

```

/* Variables: IP address - is character array
and initialized as IP address ← [„0“, „0“,
„0“, „0“, „:“... „:“ „0“ „0“ „0“ „0“
Mobileno - is character array and it will take input as
mobile number */
    
```

##### MobToIP (string mobile number)

- ```

{ 1. i←0
2. Read mobile number character by
character
3. While (mobile number has not finished)
{i. if(IPaddress[i]=0) then
{a. Copy mobile number character into
IPaddress[i]
b. Read next character of mobile
number} //end if
ii. Increment i} //end while
4. Return IPaddress} //end function
    
```

**B. IPToMob (String Address)**

This algorithm converts IP address into mobile number. It is required to display on receiver's mobile screen.

/\* Variables:

IP address as input

Mobile no is initialized to null

String1, String2←null

\*/

IPToMob (String address)

{ 1. String1←Reverse of IPaddress,

2. I←0

3. While (String1 is not null)

{i. If (String1 [i] = „0“ or String1 [i] = „:“)

then

{a. String1 [i] ←“\*“}

Else

{b. Break} }//end of while

4. String2←Reverse of String1

5. i←0

6. j←0

7. While (j<=length of mobile number)

{i. If(String2[i]!= „\*“ and String2[i]!=“:“)

{a. String1 [j] ←String2[i]

b. Increment j}}

Else if(String2[i]=“\*“)

{a. String1 [j] ← „0“

b. Increment j}}

ii. Increment i}}

8. String1 [j]←null

9. Mobileno←String1

10. Return Mobile no}

A software solution was developed in order to convert mobile numbers to IP addresses and vice versa. In this program development, it is possible to map the mobile numbers to a valid IPv6 address, and therefore there is no need for DNS lookup. In addition, there is no need for complicated hashing and addressing

protocols because the IP-to-Mobile algorithm would produce a unique number used as input, leading to a unique output hexadecimal IPv6 address. The outputted address is then allocated to private IP within a specified range in order not to conflict with other devices in the same wireless range.

## **VI. Working with Wi-Fi**

The issue while working with Wi-Fi is the radio selection in a multi-radio device. Mobile devices are nowadays equipped with several radios that support packet data communications. In addition to their long-range cellular radios (e.g., GSM and

3G/WCDMA), they often have short-range radios (e.g., Bluetooth), and medium range radios (e.g., IEEE 802.11). The mobile device should be able to select the best radio according to the situation, i.e., use a long-range radio when the device is on the move, and use a short or medium-range, high-bandwidth radio when it is in stationary.

## **VII. Sip**

SIP, the session initiation protocol, is the IETF protocol for VoIP and other text and multimedia sessions, like instant messaging, video, online games and other services. SIP is very much like HTTP, the Web protocol, or SMTP. Messages consist of headers and a message body. SIP message bodies for phone calls are defined in SDP the session description protocol. SIP offers all potentialities of the common Internet Telephony features like:

- 1) Call or media transfer**
- 2) Call conference**
- 3) Call hold**

Since SIP is a flexible protocol, it is possible to add more features and keep downward interoperability. SIP can be regarded as the enabler protocol for telephony and voice over

IP (VoIP) services. The following features of SIP play a major role in the enablement of IP telephony and VoIP:

## **IX. Future work**

In these research paper we conclude that in future we design the system that use for communication by using Wi-Fi network in these also we implement

**1. Conference call**

**2. Video call**

**3. View share**

These all thing we implement in future for proper communication

**REFERENCES**

1. IEEE 802.11: Moving closer to practical wireless LANs Stallings,
2. W.<http://www.macworld.com/article/51658/2006/07/voip.htm>

3. [http://www.voip-](http://www.voip-info.org/wiki/view/What+is+VOIP)

[info.org/wiki/view/What+is+VOIP](http://www.voip-info.org/wiki/view/What+is+VOIP)

4. IEEE 802.11 Wireless LAN Working Group

(<http://grouper.ieee.org/groups/802/11/index.html>): This site contains working group

documents plus discussion archives.

Wireless Ethernet Compatibility Alliance

(<http://www.wirelessethernet.org>): This

industry group promotes the

interoperability of 802.11 products with

each other and with Ethernet. Wireless LAN

Association (<http://www.wlana.com>):

Besides an introduction to the technology,

this site includes a discussion of

implementation considerations and case

studies from users.