

Review Article

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Wi-Fi Call

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Abstract— The use of Wi-Fi enabled cell phones to access internet away from the PC is increasing day-by-day. The use of Wi-Fi enabled phones as IP phones, and their communication within a local wireless LAN is discussed in this paper. This proposed model is a form of telecommunication that allows data and voice transmissions to be sent within a specific range of interconnected networks. The models, which are Wi-Fi enabled, can be used to communicate with each other through the Wi-Fi communication channel. Each mobile device connects to a device which hosts the Server which is a part of the network and identifies itself in the routing table. Our proposal allows free calls within the network with high quality voice transmission. This model will be a prototype of itinerant devices communicating through in the Wi-Fi bandwidth and will greatly reduce the communication cost in large organizations.

Index Terms—IP phones – phones with logical IP address, Android, Wi-Fi

I. INTRODUCTION

Communication systems have developed steadily and new means of communications are being developed from time to time. Cell phones have evolved from being simple communication devices to a powerful portable computer. The instrument has become so commercial that it's available as a key-item in everyone's pocket, benefitting the user and serving as a lucrative business for the manufacturers. The increase in the number of service providers has made it a battle-field for each of them to gain more customers, and the cheaper one always manages to outstrip others. Service providers such as Vodafone, Airtel, Loop have already earned a name in market and are still expanding their service all over the world. The idea of having a common channel (air) for sending innumerable frequencies and use the bandwidth that's available has always been fascinating for all of us – but at what cost? It is a hectic task to design a communication system knowing how badly it is susceptible to noise.

Existing technologies like the GSM based calling provided by the service providers cost users to pay for the services they use. Moreover the rates for these services vary over time and this causes the customers with inconvenience. So to eliminate the users dependence on the service providers we present a solution to this by creation of an application which gives its users the facilities like free calling within a Wireless network, Text messaging, any type of data sharing and that too in real time.

II. EXISTING TECHNOLOGY

Voice over Internet Protocol (VOIP) provides the ideas for connecting two clients through voice over the internet. The advent of Voice over Internet Protocol (VoIP) has fundamentally been transforming the way telecommunication evolves. Driven by the ongoing deployment of broadband infrastructure and the increasing demand of telecommunication service, VoIP technologies and applications have led to the development of economical IP phone equipment based on embedded systems. IP phone application can satisfyingly provide the necessary interfaces between telephony signals and IP networks. Although IP phone communication over the data networks such as LAN exists but these IP phones are fixed type. We implement wireless IP phone communication using the Wi-Fi network, VOIP phones call without the use of a computer; instead they connect directly to the IP network (using technologies such as Wi-Fi or Ethernet).

Unlicensed Mobile Access (UMA) is a 3rd Generation Partnership Program global specification that provides a standard for service providers to merge mobile networks and wireless LANs into a single seamless access network with one mobile device, one user interface, and a common set of network services for both voice and data. In fact, the UMA solution converge cellular networks with any IP-based access networks, including wired and wireless technologies such as IEEE 802.16 WiMAX networks, IEEE 802.20 Mobile Broadband Wireless Access, and Ultra Wideband (UWB)-based networks (*Fig. 1*).

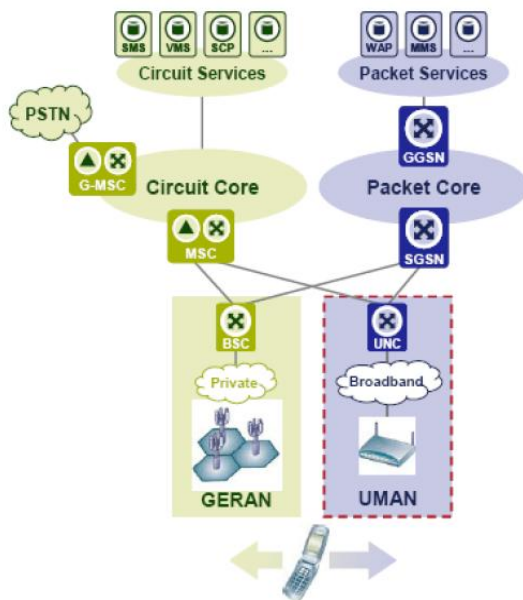


Fig. 1. UMA connection mode.

With UMA, subscribers can move between mobile networks and WLANs with seamless voice and data session continuity as effortlessly and transparently as they move between cells within the mobile network. The UMA solution effectively creates a parallel radio access network, the UMA Network (UMAN), which interfaces to the mobile core network using existing mobility-enabled, standards-defined interfaces. The existing service provider Business Support Systems (BSS), service delivery systems, content services, regulatory compliance systems, and Operation Support Systems (OSS) will support the UMA network without change. Service enhancements and technology evolution of the mobile core network apply transparently to both the GSM access network and the UMA network.

III. CALLING WITHIN THE NETWORK

For a mobile device to communicate with a router it needs a platform. An Android application can be used in a mobile device that is Wi-Fi enabled to communicate with a router. This is a very useful tool because by communicating with the router directly, many processes of networking can be simplified. Android provides a robust, flexible environment for applications running on mobile. It includes flexible user interfaces, robust security, built-in network protocols, and

support for networked and offline applications that can be downloaded dynamically. So this platform is what connects the user and his device to the server running on another laptop connected to the same network. The application will record the voice from the transmitter side and store it in a buffer and this data stored in the buffer will be received at the receiver's side.

For placing a call to any person X a user needs to ensure that the person X is connected to the network and registered on the server running on the laptop. The user will request the server to send the IP of the person X which on receiving a request will reply with an IP (if available). On receiving the IP the caller device will create a socket and communication will begin over that particular socket.

If the person X moves out of the range of the network the call will automatically be terminated and the entry of person X will be removed from the server.

A. SEQUENCE OF STEPS-

- When a device connects to the network it receives an IP from the Wireless router which is then added in the server's routing table.
- Each phone is identified by a user name. So the routing table updates its IP with a corresponding user name.
- Calls can be made to any user in the routing table identified by user name and this information is made available to all users logged into the network.

IV. PROPOSED SYSTEM

The proposed system consists of a server and various devices connected within a wireless network whose proximity is up to 150 feet indoors and 300 feet outdoors. Initially all the devices need to register to the server with an IP assigned dynamically by the Wi-Fi router and a username chosen by the user. This creates a network of the registered users who can communicate within the network range. The registered users are listed out in the client list on server. The clients contact or request the server for the list of available users and can communicate with the other clients.

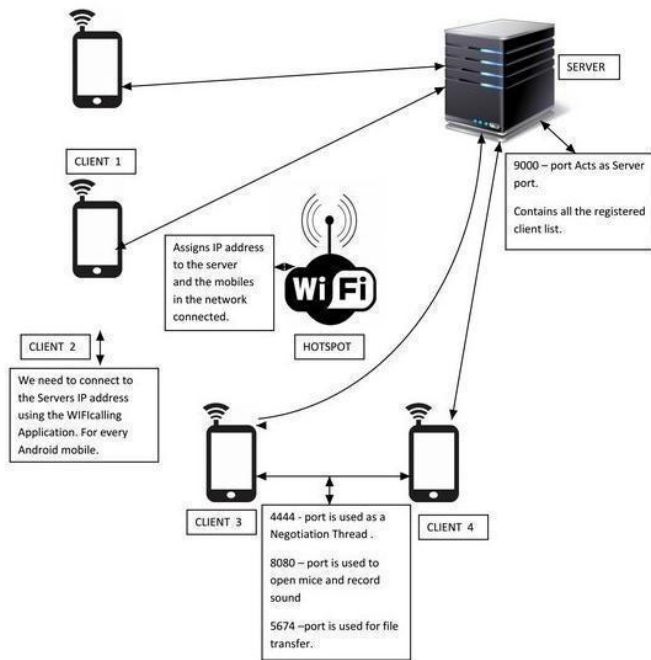


Fig. 2. System Architecture

The communication is done with the help of network sockets. Distinctive ports are used for different tasks of calling, connection with the server, and for file transfer. The proposed system allows for communication between people within a network in organizations without any cost. The communication uses the Wi-Fi channel as a medium and does not require any internet data usage as in VOIP. The channel bandwidth of Wi-Fi allows for real time voice and file transfer without any delay.

Facilities provided are voice calling and text messaging; users can also share their files.

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V. ADVANTAGES

- Allows phone calls at zero cost.
- It is highly secured, because no outside device has access to the data uploaded and downloaded between routers and the device
- Easy to implement.
- Does not require any extra hardware to be installed in the device.

VI. CONSTRAINTS

This model can service any number of users but it shows poor performance in a slow network and may be slowed down by problems like cross talk, delay, routing failure in high traffic situations. Initial cost is high and it will only work on phones that are Wi-Fi enabled (which are more expensive than non-Wi-Fi enabled handsets).

VII. CONCLUSION

This project provides a cheap, effective and secure means of communication within a specified network. The cost involved is only the initial set up cost and all calls within the network are free. This model will be very useful to solve the communication problems in large organizations, by making free voice calls through Wi-Fi.

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