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Cost free Wi-Fi intercom system using ARM11: Review

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Abstract

To make a telephonic conversation over IP network Voice over Internet Protocol (VoIP) is required. By using asterisk with VoIP in ARM11 processor WiFi based communication can be established. Voice communication over IP network can be done using IPPBX server which can be implemented by using packages of Asterisk. To provide wireless communication using WiFi, SIP clients will register with the asterisk server.

Keywords: VoIP, asterisk, IPPBX, ARM11, SIP, WIFI

1. Introduction

To provide a voice communication there were many technologies available like GSM (Global System for Mobile) and 3rd Generation mobile telecommunication 3G, but at high cost [5]. The main challenge is to provide the same service over mobile phone at no cost. VoIP (Voice over Internet Protocol) is the technology that provide voice communication through internet. Using this technology completely free of cost voice communication system can be setup. Traditional telephony system are too expensive for voice communication. PBX (Private Branch Exchange) for voice communication proves to more expensive, requires more man power and extra wiring [6]. Also EPABX (Electronic Private Automatic Branch Exchange) is used for voice communication. But EPABX provides less security and for adding new user it requires extra wiring which proves to be more costly. To overcome the pitfalls of EPABX another new technology i.e. IPPBX is introduced [8]. IPPBX (Internet Protocol Private Branch Exchange) a complete telephony system which will allow us to make a free of cost calling over Wi-Fi. For this on Cent OS Linux operating system packages of Asterisk should be install as a means of backbone of voice communication. This will be a complete client –server architecture in which server is Asterisk and client will be the smartphones that will register with asterisk server.

2. Literature survey

Earlier, the telecom engineer's goal was to provide the service to their customer at any cost. The customer faced the problem of high cost, only the rich people could afford that services. At the same time customers were also growing tremendously. The changes have been made to this situation after few years. To transfer voice earlier PSTN network were used consisting of private branch exchange system owned by service provider. In earlier days for communication it requires more cost and takes time. The new technologies emerging in communication sector has overcome this problem. People can communicate using skype application on Wi-Fi/3G. But it is only pc to pc communication using VoIP and requires more cost for voice communication [2].

The early LANs were operated on thick cable to cover up to 500 meters per segment. Hence wireless LAN has removed this problem which is comparatively easy to maintain, simple and quick installation. The main motive is to provide cost effective voice communication system. But this system has issues related to mobility and requires more time for configuration. To setup and maintain wired connection on every individual's device was troublesome. Earlier LANs require thick cable to cover distance up to 500 meters per segment Wired LAN was employed to transfer the voice over local area network consisting of configuration like 802.3,

802.4 etc. There were many problems with wired LAN like wiring cost and maintenance, also there was lack of mobility with wired system. Later WLAN has been used for voice communication over Local Area Network ^[4].

Many organization used Electronic Private Automatic Branch Exchange (EPABX) for voice communication with employees of their organization and also with outside world. In this system copper cables provides the connection between user extension and central electronic system. But EPABX has many disadvantages such as it is less secured, less flexible and require a lot of maintenance work. Also for adding new user extension it requires extra wiring which was very costly. To overcome these drawbacks traditional EPABX is replaced with Internet Protocol Private Branch Exchange (IPPBX) ^[3].

The voice communication using IPPBX can be done on laptops or smartphones having Wi-Fi facility. IPPBX has reduced the installation and configuration time. EPABX requires more man power has been overcome by IPPBX. It provides cost efficient service. IPPBX provides internet access, traditional telephonic conversation and VoIP communication in a single line. IPPBX provides flexibility and reduced maintenance cost ^[3].

In late 90's a new technology to transfer the voice has been introduced called as Voice over Internet Protocol (VoIP). VoIP allows communication over broadband internet connection instead of using analog telephone lines. Using VoIP one can make a call over internet ^[6]. VoIP (Voice over Internet Protocol) PBX system uses the LAN to configure extensions. IPPBX is the server to which the user get connected through their laptops or smartphones having Wi-Fi facility ^[8].

Asterisk is the open source free software implementation of telephone Private Branch Exchange (PBX) written in C programming language and it runs on Linux operating system ^[1]. Voice communication using Asterisk is implemented at low cost and easy to add or remove additional extensions. One can implemented asterisk based IPPBX system to make unlimited call free within Local Area Network (LAN) without internet connection. Asterisk is telephone system in the form of software using this expensive extensions of telephone system are replaced and easy to customized ^[7].

SIP (Session Initiation Protocol) in IPPBX is used to establish the session between two users. Basically we want to make a voice call ^[2]. Client 1 and 2 will register with server with the same IP address. When Client 1 makes call to Client 2, then Client 1 sends the request to server where server checks the IP address of Client 2 and sends IP address of Client 2 to Client 1 to establish peer to peer connection. After getting SIP Client in your Smartphone you need to configure it.

3. Conclusion

This paper describe the use of IPPBX server for voice communication because it can be implemented using asterisk which is open source PBX software packages. Hence by implementing IPPBX server voice communication can be done on smartphones and laptops free of cost. This system has many advantages like excellent voice quality and many user can be connected with the same server. Also it has reduce the cost of extra wiring needed in earlier system.

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