Design and Implementation of Wi-Fi IP-PBX using Raspberry Pi

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Abstract: **This paper highlights the look & implementation aspects of a VoIP primarily based Asterisk voice exchange, developing a completely purposeful voice exchange needs to line up a server supported Asterisk, connecting clients to that server with the help of softphones and then configuring the softphones with the help of a server as the modern telephone networks begun to take shape, private corporations saw a larger reliance on telephone communication. Many decide to implement their own service. So that they could handle calls internal to the organization. Voice telecom over mobile is presently supported at a price mistreatment service supplier like GSM or using IP service provider at the cheaper cost. The purpose of this research is to design and implement a telephony program that uses WIFI in p2p (Peer-to-Peer) or WLAN (Wireless Local Area Network) as a means of communication between mobile phones at no cost. The asterisk package can use a correlation between current address books accessible in mobile phones to convert phone numbers into scientific discipline addresses.**

Keywords: **Raspberry Pi, IP PBX, VOIP, GSM Dongle.**

1. Introduction

Voice over net Protocol (VoIP) could be a kind of communication that enables you to form phone calls over a broadband net association rather than typical analog telephone lines. Basic VoIP access sometimes permits you to decision other United Nations agency are receiving calls over the web. Interconnected VoIP services additionally permit you to form and receive calls to and from ancient landline numbers, sometimes for a service charge. Some VoIP services need a laptop or a zealous VoIP phone, whereas others permit you to use your landline phone to position VoIP calls through a special adapter. The system based mostly is predicated relies on the software system known as "Cent OS for pi" that is UNIX operating system based VoIP PBX server software system for the raspberry pi. These operative systems comprise the telephone package known as "Asterisk". This software system with Asterisk is installed in Raspberry Pi. The Raspberry Pi could be a series of a credit card–sized single-board computers developed within the UK by the Raspberry Pi. though vox information processing (VoIP) has existed for many years, it's solely recently begun to require off as a viable different to ancient voice systems. Interest in VoIP has a big part as a result of the technology will facilitate the enterprises to cut back prices by employing a single information processing network

for each knowledge and voice applications. VoIP provides a way of transmission auditory communication over associate degree information processing primarily based network. VoIP will use a spread of kinds of protocols, far and away the foremost common varieties square measure SIP i.e. session initiation protocol. The IPPBX system could be a phone switch serving a business or organization. The PBX provides phone services together with internal vocation, auto-attendant, voice-mail, and automatic decision distribution services for the organization. within the ancient circuit-switched telephone world, folks were connected by dedicated circuits that were designed over one hundred years past. The introduction of information processing (Internet Protocol) has modified the telephone market on several levels. IPPBX offers another to EAPBX for voice, and with it, information processing primarily based solutions for telephone systems. one amongst the explanations giant enterprises square measure drawn to information processing telephone is that the potential potency gained from combining the voice and knowledge functions in one single organization.

2. Literature review

1. Asterisks Internet Protocol Private Branch Exchange with Smartphone in International Conference on Science and Engineering for Sustainable Development (ICSESD-2017) by Mr.V.P.Yadav, Dr.P.S.Prasad; 2017

This paper intends to present some important theoretical and practical results that we faced during setting up a VoIP (Voice over Internet Protocol) server with the well-known open source VoIP server Asterisk. For a fully functional voice exchange we require to set up a server based on Asterisk, connecting clients to the server with the help of soft/hard phones and then comes the configuration aspects of the soft phones with the server. Here in our implementation we have connected the clients to the server with the help of SIP protocols.

2. Asterisk Wi-Fi portable Voice Calling System using ARM11 in International Journal of Applied Research by Sayyad Nikhat Parveen, Prof. Tirupati M., Goskula 2016.

This journal discusses an Internet Protocol Base Private Branch Exchange System consists of one or more SIP (Session Initiation Protocol) phones. The IP PBX server functions in a similar manner to a proxy server: SIP clients, being soft phone

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or hardware-based phones, register with the IP PBX server, and when user wishes to make a call user ask the IP PBX to establish the connection. The IP PBX has a directory of all phones/users and their corresponding SIPS address and thus is able to connect an internal call. An IPPBX is a complete telephony system that provides telephone calls over IP data networks.

3. Advance Ippbx System for Free of Cost Calling in Campus in 2014 International Journal of Advanced Research in Computer Science and Software Engineering by Reetesh V. Golhar, Suyog K. Dahule, Mangesh D. Ramteke, Vishal, D. Jaiswal Nutankumar, S. Jane

This Journal discusses associate degree IP-PBX System may be a complete telephone system that offers freed from value, while not the sim card wireless business. so as to form these measuring we've used the open supply software system like Cent-Os and a few packages, by victimization this software system and packages we will implement our IP-PBX server. By Implementing this server, we will build wireless communication within the vary of Wi-Fi. the normal EAPBX system is overcome by this IP-PBX System. it's advanced technology of communication, therefore for upgrading day to day business communication, this IP-PBX System is a figure as a breeze.

4. Implementing VoIP in a Small Enterprise Network in 2015 International Journal of Advanced Research in Engineering & Management (IJAREM) by Alao Rithwan Olatunji

This paper discusses the implementation of VoIP in a very tiny enterprise network. VoIP which might be delineated because the method by that transmission and oral communication is digitally delivered over the network protocol is being endlessly enforced in several enterprise networks be it tiny or massive. It may well be deployed as associate degree open supply or proprietary or virtual/hosted answer. This implementation is distributed in many ways that supported totally different IP-PBX like Asterisk. However, to implement VoIP in a very tiny enterprise network, factors like value, bandwidth, flexibility, and availableness should be thought of. thus 3CX that may be a proprietary and value and price and value} effective IP-PBX and SIP trunking that may be a cost-effective VoIP protocol compared to alternative typical trunking protocols are thought of appropriate for any low enterprise VoIP and are mentioned during this paper.

5. IP-PBX: Architecture and Protocols" in IORD Journal of Science and Technology by Mr. Mukund A. Ghogale, Dr. Prashand V. Ingole; Sept-Oct 2014

The paper describes that Wireless communication plays an important role and VoIP is one in every of the foremost exciting new developments rising at intervals the telecom market. Wireless VoIP utilizes wireless local area network technology, constant wireless infrastructure used for the company network, so as to speak. Wireless information processing phones may be accustomed access company telecom system because the technology combines the telecom operate directly into associate degree already existing knowledge network infrastructure.

Network adapter, and magnetic disc adapters. The host provides pass-through drivers for guest USB, serial, and parallel devices. during this manner, Virtual box provides virtual machines for different software package within the same computer.

3. Conclusion

VoIP technology is one of the widest victimization technologies that support to deal with communication from anyplace in the world. VoIP engineering is essentially variable telecom business, sanctionative not simply less costly calls however conjointly providing a lot of advantageous and wealthy options and a lot of versatile services. An increasing variety of service supplier is one among the explanations of VoIP technology to be cheaper relatively with others. The IPPBX system staff the options of the organization like decision transfer, music on hold, voice mail and audio conference. It uses the present network infrastructure that the value of wiring reduces. it's straightforward to tack together the softphone. it's conjointly versatile for the users further as associate administrator. it's straightforward to make and delete the extension VoIP could be a quickly growing technology in scientific discipline network, which needs a period of time support because it is a time-sensitive application. VoIP in scientific discipline network is meant for digital communication, however, to realize reliable, high-quality voice the scientific discipline network is an associate engineering challenge. For planning an honest quality VoIP implementation victimization Asterisk PBX system includes selecting the simplest codec and applying the proper technique.

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