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RESEARCH ARTICLE

PORTABLE LOW COST WI-FI INTERCOM SYSTEM USING ARM11

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ABSTRACT

The new technology has the ability to transmit a voice over Internet protocol process networks by using an Asterisk PBX. In present day, companies implement to produce different VoIP products of many features in market. This paper has an aim to introduce the VoIP and implementation of Wi-Fi based intercom system using ARM11 to based on Asterisk PBX. In this paper, we first introduce theory of VOIP. Next step is using ARM11 on Asterisk PBX .And Final step is the live project, live experimental set up and how to connect SIP voice traffic on Arm11.This paper shows the ability of voice calls to initiate using SIP with better stability and accuracy using Asterisk PBX.

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INTRODUCTION

Many years ago, an old telephone system was improved into a new substitute known as Private Branch Exchange (PBX). PBX system performs communication tasks such as inbound calls and outbound calls. PBX system performs VoIP algorithm. Voice over Internet Protocol is used to transmit voice data over internet, using the same type of data those are we send and receive as e-mail. PSTN is like an internet or broadband connection that changes to VoIP services. It offers to make calls by converting consumer's voice into packets. We use VoIP technology to transmit voice signals over the internet using packet switching technique. These packets are transmitted through the internet from one user to another user and another user collecting these packets gets converted voice. VOIP is introducing latest advantageous features, because in previous VOIP there were so many QoS questions and security. Main aim of VoIP service is to provide good voice quality and security. In this VOIP PBX some issues were obtained, so after that we used a new development of Asterisk based on Voice Exchange. It is best voice exchange based on Asterisk, it work on VOIP and it has good solution for flexibility. In 1995, VoIP technology was developed.

Aim and objective: Aims and Objectives of different parts are described in stages concerning to complete of this project

- To develop VOIP server by using asterisk software.
- To create configuration files.
- To install Linux on ARM11.
- To install asterisk on Linux.
- To program the user registration.
- To program the dial plan for calling.
- To test the calling on LAN network using soft phone.

Related work

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. An IP PBX is a complete telephony system that provides telephone calls over IP data networks. A LAN network is connected to the Computer that helps the mobile phones connect through IP address of it which makes it possible to make voice call.

- S.R. Sonaskar. "Design and Implementation of IP-PBX for Small Business Organization International Journal of Engineering Innovation and Research Volume 1, Issue3, ISSN: 2277€5668 2''.
- Prof. S.D.Giripunje and Sandeep Sonaskar.

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"Low Cost IP Private Branch Exchange (PBX) International Journal of Computer Applications (0975-8887)".

Project overview

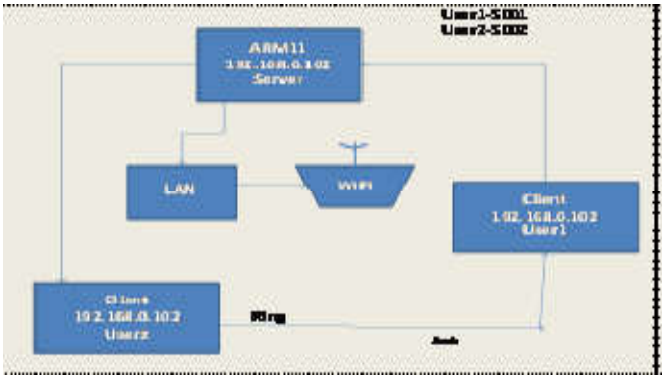


Fig . 1. Block diagram of the system

The Basic block diagram of the system is as shown in fig.1.

- In fig ARM11 is the server. ARM11 is connected to client1 through LAN using Wi-Fi and give IP address to the client1 and client2.
- Connect client1 and client2 to the network and client2 is also connected to ARM11 using wi-fi.SIP:

    - SIP stands for Session Initiation Protocol. The protocol has been designed with easy implementation, good scalability, and flexibility in mind.
    - SIP is not the only protocol that the communicating devices will need. It is not meant to be a general purpose protocol.
    - Purpose of SIP is just to make the communication possible, the communication itself must be achieved by another means (and possibly another protocol).

Design steps for implementation

- To Implement IP PBX System Using ARM 11.
- To install Linux on ARM 11.
- To install Asterisk on Linux.
- To program the user registration.
- To program the dial plan for calling.
- To test the calling on LAN network using Soft Phone.

Hardware resources

Raspberry Pi: The Raspberry Pi is low cost ARM based palm-size computer. The Raspberry Pi has microprocessor ARM1176JZF-S which is a member of ARM11 family and has ARMv6 architecture. ARM processor operates at 700 megabytes and it has 512 megabytes RAM. It consumes 5V electricity at 1A current due to which power consumption of raspberry pi is less. It has many peripherals such as USB port, 10/100 ethernet, GPIO, HDMI and composite video outputs and SD card slot. SD card slot is used to connect the SD card which consist of raspberry linux operating system.

Fig. 2. Raspberry pi ARM 11 kit architecture

Software resources

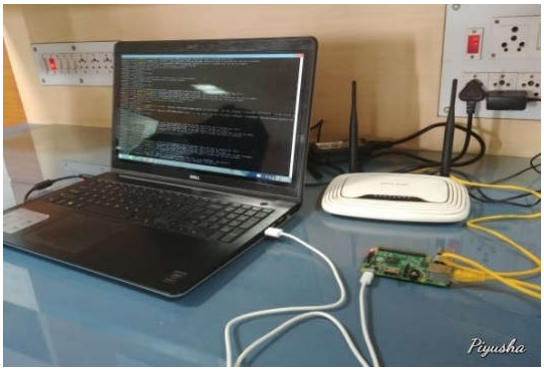
- Linux based Operating System
- Asterisk IPPBX Package
- Soft phone Other resources:

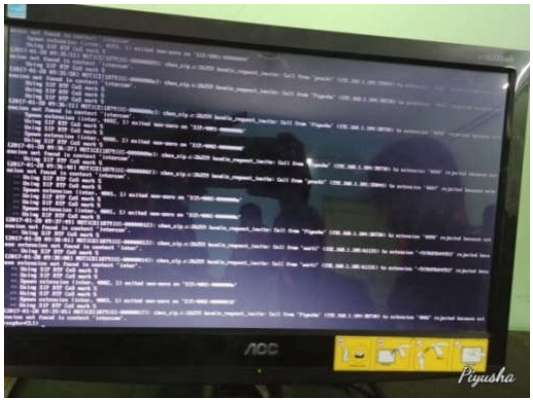
Soft Phones convert any multimedia PC into the functional equivalent of a telephone, allowing users to make calls over any internet connection : X-Lite / Zoiper.

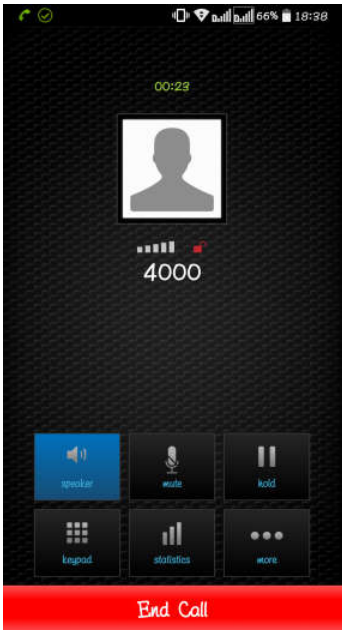
Experimental setup

Steps for calling the users

- On the Wi-Fi access, soft phone registers its fixed IP, where the Wi-Fi will update this soft phone being active.
- Each phone is identified by a user name, updating the IP address with a corresponding username.
- If you Call any user, the logs of each user is available on the main server.
- When the Wi-Fi range is not avaliable, then call handoff.







RESULT AND CONCLUSION

VoIP technology is one of the most widely used technologies which support to deal with communication from anywhere in the world. VoIP engineering is necessarily varying telephony industry, enabling not just less expensive calls but also providing more advantageous and rich features and more flexible services. Increasing number of service provider is one of the reasons of VoIP technology to be cheaper comparatively with others. Although, challenges stay behind, VoIP technology already plays a key function in business communications and is rapidly varying the residential and consumer landscape of domestic and international communication affair.

Future Scope

- To set up this network in large organization.
- To increase the number of calls.
- To make a conference call adding some software.
- It runs on solar panel.

REFERENCES

SR. Sonaskar, "Design and Implementation of IP-PBX for Small Business Organization International Journal of Engineering Innovation and Research Volume 1, Issue3, ISSN: 2277€5668

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