VIRTUAL CALLING SERVICE USING ASTERISK PBXs ON RASPBERRY-PI

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Abstract— **The ability to transmit and process voice over Internet protocol (VoIP) networks has important implications for technology users especially by the using Asterisk PBX. Many companies nowadays are rushing to bring different VoIP products to market with a wide variety of features.**

This project will focus on the introduction of VoIP and its implementation by the use of Asterisk PBX. Firstly, the abstract presents the project objective with some introductory theory about VOIP. Secondly, the project includes report on the viability of utilizing the Asterisk PBX as a foundation for conducting research performance studies for VoIP.

Finally, the project is showing on live experimental studies of SIP voice traffic. The article experimentally studied the performance of voice calls initiated using SIP simulator for testing SIP protocol performance and found much more stability and accuracy using Asterisk PBX. The purpose is to suggest those VoIP technology attributes that best meet users' needs. Asterisk, the open source PBX of choice is used to show that this is maturing fast and ready for main stream VoIP implementation.

Keywords— **VoIP (VOICE OVER INTERNET PROTOCOL),**

Asterisk, PBX (PRIVATE BRANCH EXCHANGE),

SIP (Service Initiation Protocol)

I. INTRODUCTION

An Implementation of a one-to-one model-based virtual phone system, THE VIRTUAL TALK, is presented.Virtual calling service deals with conventional calling between two users without the use of any SIM card or internet connectivity.

In rural areas where communication is mandatory Network service providers do not provide services until there are enough customers to provide satisfactory profits to the company, over coming this problem THE VIRTUAL CALLING SERVICE is going to provide a portable calling service with a wide range of 15 – 20 kms(using repeaters), free of cost.With Additional Features Video calling services will also be provided.

II. ASTERISK

Asterisk is a software implementation of a telephone private branch exchange (PBX); it allows attached telephone to make calls to one another, and to connect to other telephone services, such as the public switching telephone network (PSTN) and voice over internet protocol (VoIP) services.

Asterisk is released with a dual license model, using the GNU general public license (GPL) as a free software license and a proprietary software license to permit licensees to distribute proprietary, unpublished system components.Asterisk was created in 1999 by Mark Spencer of Digium. Originally designed for Linux, Asterisk runs on a variety of operating systems,including NetBSD, OpenBSD, FreeBSD, macOS and Solaris, and can be installed in embedded systems based on OpenWrt and on flash drives

Asterisk supports several standard voice over IP protocols, including the Session Initiation Protocol (SIP), the Media Gateway Control Protocol (MGCP), and H.323. Asterisk supports most SIP telephones, acting both as registrar and back-to-back user agent, and can serve as a gateway between IP phones and the public switched telephone network (PSTN) via T- or E-carrier interfaces or analog FXO cards. The Inter-Asterisk eXchange (IAX) protocol, RFC 5456, native to Asterisk, provides efficient trunking of calls among Asterisk PBX, in addition to distributing some configuration logic. Many VoIP service providers support it for call completion into the PSTN, often because they themselves have deployed Asterisk or offer it as a hosted application. Some telephones also support the IAX protocol.

III. INTERFACING WITH RASPBERRY PI

The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries.The original model became far more popular than anticipated,selling outside of its targets market for uses such as robotics. Peripherals (including keyboards, mice and cases) are not included with the Raspberry Pi. Some accessories however have been included in several official and unofficial bundles.
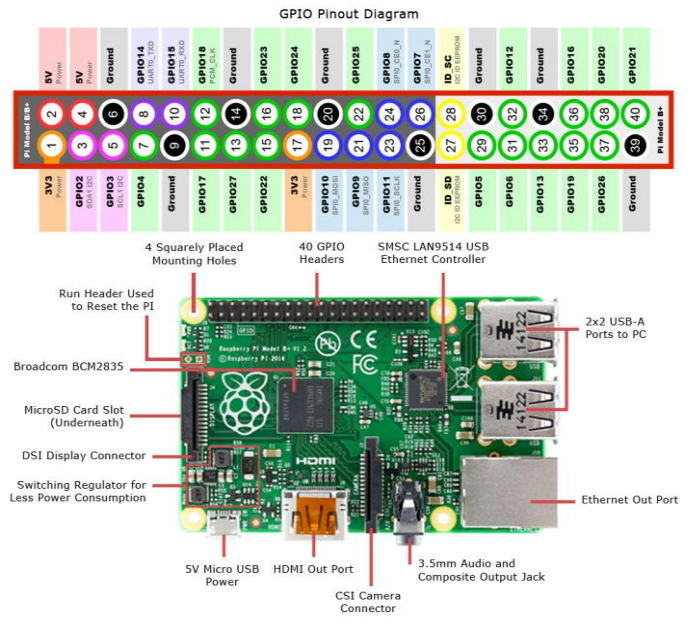

Figure 2: Raspberry pi board pin structure

Figure 1: Raspberry pi 3 board

The Raspberry Pi primarily uses Raspbian OS, Debian-based Linux operating system.Other third party operating systems available via the official website include Windows 10 IoT Core, RISC OS and specialized KODI media center and classroom management.Many other operating systems can also run on the Raspberry Raspberry pi is connected wireless access point by using Ethernet cable.

Figure 3. Raspberry pi is connected to router with the help of eternet cable

It establish virtual network i.e. wireless network within range of router.

IV. CONFIGURATION

Firstly we have to start wireless access point (WAP) and connect it with server(raspberry pi) providing supply to both modules, then by using IP address of WAP for D-link router that is 192.168.0.1 where we will find out active client IP address (ip address of server).
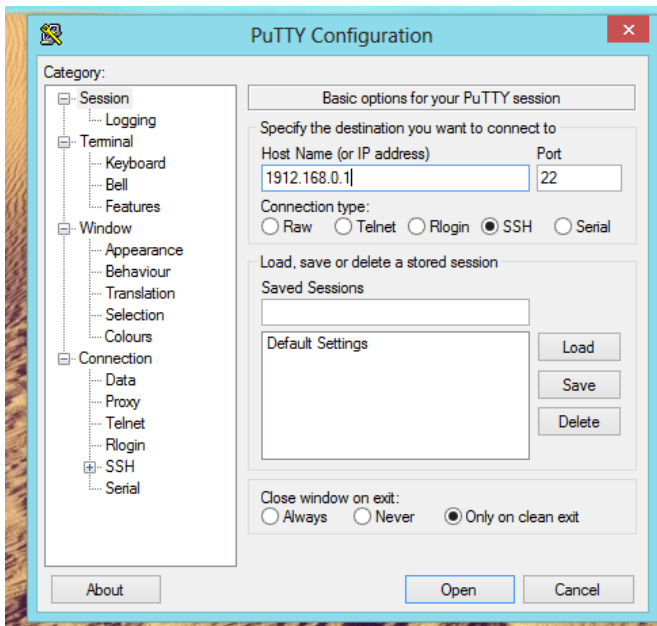

Figure 4. Putty Configuration

After getting IP address of server, open putty configuration app and write that IP address in Host name which result in opening of login window.
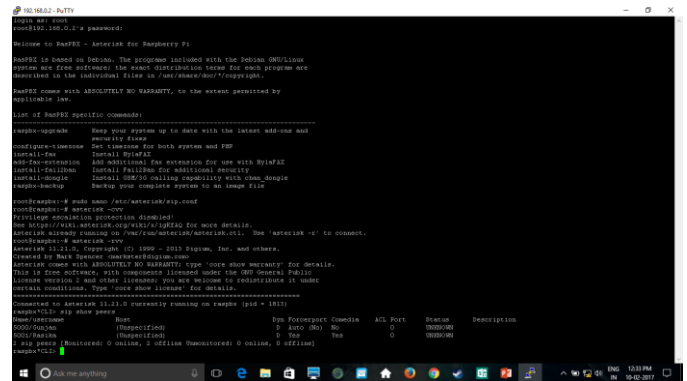

Figure 5. Login window of putty

In this window we start asterisk using command

asterisk -cvv

asterisk -rvv

When asterisk get start we program server using sip and extensions conf

V. BASIC CODING FOR ASTERISK

Basic code for SIP.CONF which is used for creating users is

[general]

port =5060

bindaddr=0.0.0.0

[1000]

username=sanket

```
secret=123456

host=dynamic

context=intercom

type=friend

allow=alaw

qualify=yes
```

Basic code for EXTENSIONS.CONF for establishing dialing is

```
[general]

static=yes

writeprotect=no

[global]

[default]

[intercom]

exten=>_1xxx,1,Dial(SIP/${EXTEN}];

exten=>_1xxx,2,Hangup();
```

Then using "core reload" and "sip show peers"command avaibility of user can be found. On other side ZOIPER app has to be downloaded on mobile or computers, after registering on app with proper username call can be establish with in that wifi region without SIM/INTERNET.

VI. SCOPE

1.Free communication on smartphone in the wifi range of system without internet and without SIM card.

2. Reception is voice recorded message and as per the number pressed the call is transfer to the smartphone in the network.

3.Reducing the cost of Communication.

4.Video calling can be establish for free in future.

5.WiFi range can be increased for higher range routers or using repeaters which can increased distance upto 50km.

VII. CONCLUSION

In this paper, we have demonstrated that calling without sim and internet is possible.We have successfully develop model on virtual calling service by using asterisk on raspberry pi. We have also learn that distance depends on wifi range of router. More power the router higher the range for calling. It is possible to increase range up to 50 km.

VIII. REFERENCES

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