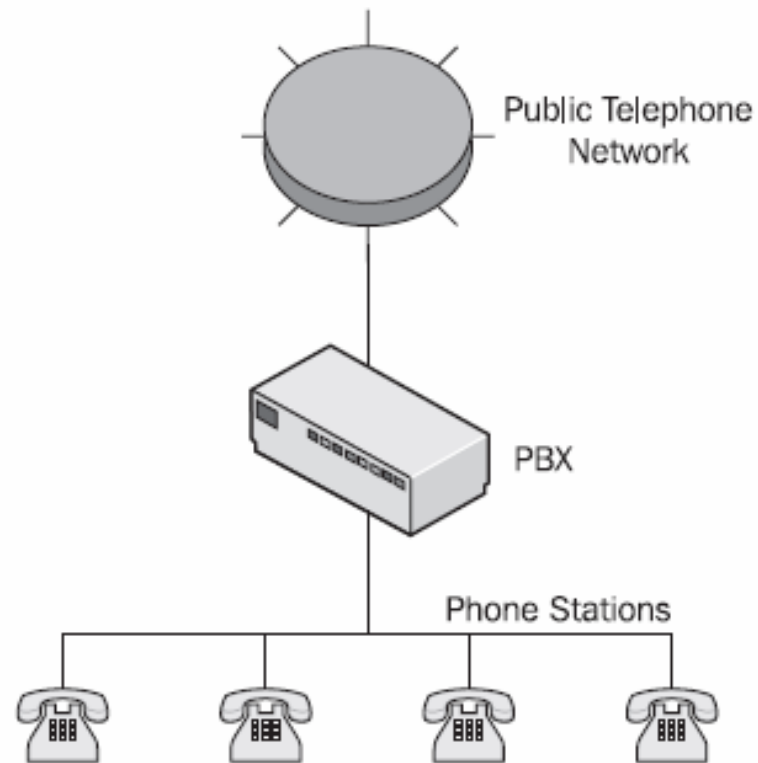


# VOIP: Comunicaciones de voz sobre redes IP

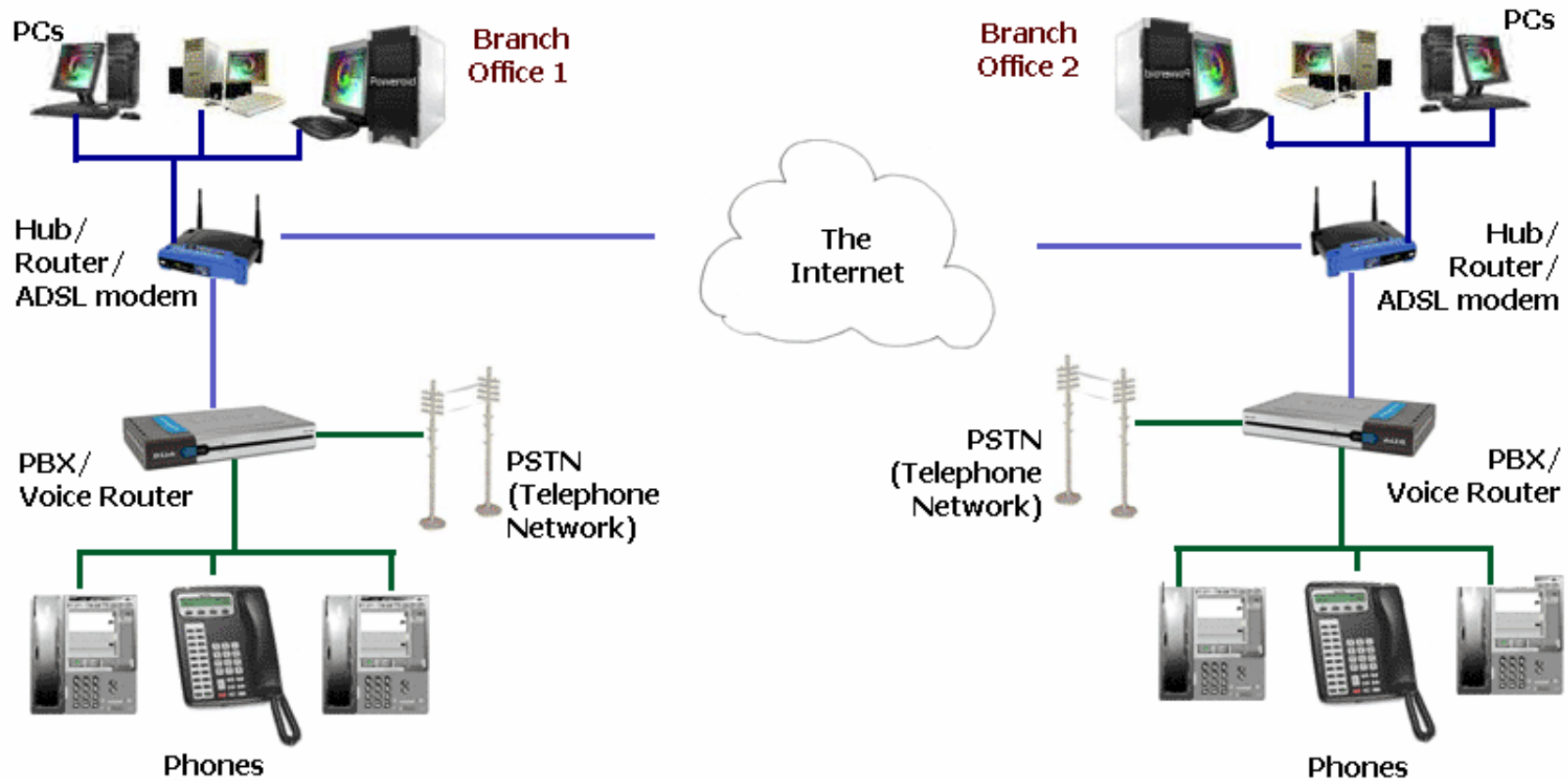
February 2007



## Common PBX diagram



# Common VoIP diagram



## VoIP

- VoIP – Voice over Internet Protocol
- Invented in 1973, Commercialized 2004
- Protocols: H.323, SIP, IAX2
- Codec: G.711, ILBC, G.729, GSM



## Bandwidth requirements per codec

Codec	Single Call	Two Calls	Additional Calls	Calls per megabit
G.711 (ulaw)	81.1kbps	148.0 kbps	65.9kbps	15
ILBC	28.0 kbps	49.3 kbps	21.2 kbps	47
G.729	30.0 kbps	39.7 kbps	9.6kbps	103
GSM	35.4 kbps	50.2 kbps	14.7 kbps	68



## VoIP Advantages

- Free Internal Calls
- Mobility
- Virtual incoming number
- Fast & Easy Integration



## VoIP Disadvantage

- Dependent on internet connection
- Downtime
- Possible Bad Voice Quality
- Power outage
- Not for emergency calls



## Asterisk

- Open-Source software
- Powerful Telecommunication system
- Telephony software framework
- Hybrid connectivity



## Asterisk features

- Interactive Voice Response
- Call Detail Records
- Call Forward
- Call Queuing
- Call Routing
- Call Transfer
- Caller ID
- Conference
- Music On Hold
- Voicemail



## Trixbox

- GUI for Asterisk
- Free
- Simple to install
- Easy to use
- Modular
- Can be used for advanced tasks



## Trixbox installation

- Download ISO from [www.trixbox.org](http://www.trixbox.org) and burn CD
- Boot from CD
- Follow easy installation wizard
- After few reboots server is ready



## Login to console

```
login as: root
root@192.168.1.29's password:
Last login: Thu Jun  1 22:49:08 2006 from 192.168.1.3

Welcome to trixbox
-----

For access to the trixbox web GUI use this URL
http://192.168.1.29

For help on trixbox commands you can use from this
command shell type help-trixbox.

[root@asterisk1 ~]# █
```



## Open web interface

freePBX™

• [Setup](#) • [Tools](#) • [Reports](#) • [Panel](#) • [Recordings](#)

Administration

Welcome

Language:  ▼

### freePBX

Welcome to the FreePBX Administration 2.1.1



## Create SIP extension

Administrators	<h3>Add SIP Extension</h3> <p><b>Add Extension</b></p> <hr/> <p><u>Extension Number:</u> <input type="text" value="100"/></p> <p><u>Display Name:</u> <input type="text" value="Extension 100"/></p> <p><b>Extension Options</b></p> <hr/> <p><u>Direct DID:</u> <input type="text"/></p> <p><u>DID Alert Info:</u> <input type="text"/></p> <p><u>Outbound CID:</u> <input type="text"/></p> <p><u>Emergency CID:</u> <input type="text"/></p> <p><u>Record Incoming:</u> <input type="text" value="On Demand"/> ▼</p> <p><u>Record Outgoing:</u> <input type="text" value="On Demand"/> ▼</p> <p><b>Device Options</b></p> <hr/> <p>secret <input type="text" value="1234"/></p> <p>dtmfmode <input type="text" value="rfc2833"/></p>
DISA	
<b>Extensions</b>	
Feature Codes	
General Settings	
Inbound Routes	
Outbound Routes	
Trunks	



# Create IAX2 trunk

## Add IAX2 Trunk

### General Settings

Outbound Caller ID:

Maximum channels:

### Outgoing Dial Rules

Dial Rules:

Dial rules wizards:

Outbound Dial Prefix:

### Outgoing Settings

Trunk Name:

PEER Details:

```
host=salinas.camari.org
username=***userid***
secret=***password***
type=peer
```



# Create outgoing routing

## Edit Route

[Delete Route 9\\_outside](#)

Route Name: 9\_outside

Route Password:

Emergency Dialing:

### Dial Patterns

```
00161XXXXXXXXX
0031 | [123457]
XXXXXXXXX
00353.
0036.
003812.
00385 [59] .
00593 [8-9] .
0 | [123457]XXXXXXXXX
ZXXXXXX
```

Insert:

### Trunk Sequence

0

