

CALUG - PBX in a Flash

- Overview
- Planning
- Security
- Setup
- Bells and Whistles
- Summary

Overview

- Swift Staffing
- Opensource Programs
- Asterisk – Digium
- Traditional (POTS) vs VOIP
- Hosted, Commercial or Your Box

Planning

- Determine What Features are Important
- System Design
- Connectivity
- Digital Phones
- Router Capabilities
- VOIP Provider

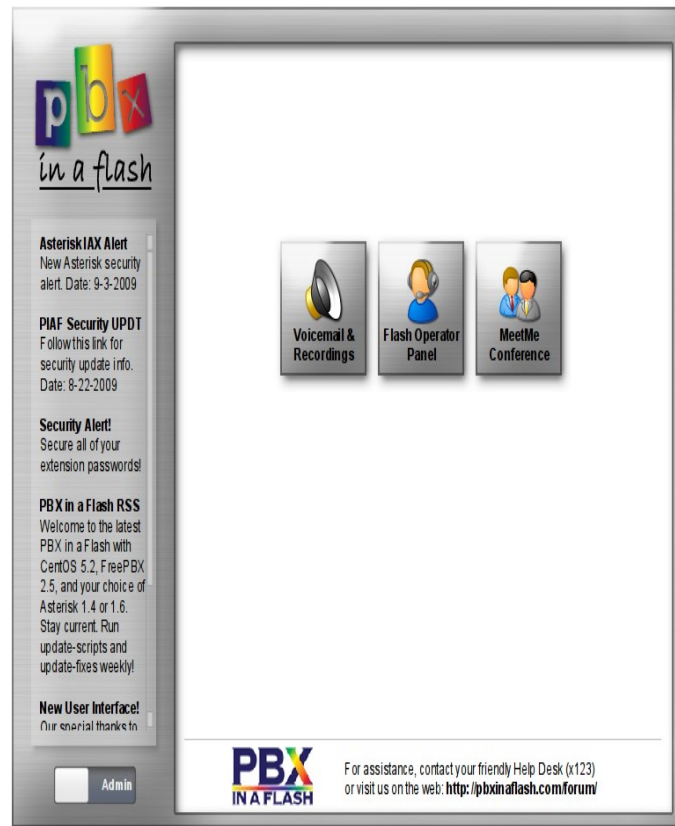
Security

- VOIP Systems Compromised
- Iptables
- Hardware Firewalls
- Fail2ban
- Passwords
- Updates
- Logs
- VPN
- Webmin

PBX In A Flash Install

- Download iso (pbxinaflash.net/downloads)
- Vmware appliance
- Extract iso and install
- CentOS 5.x based with webmin, asterisk and scripts
- Update-scripts and change default passwords
- Assign static ip
- Access IP address
- Port forward UDP 5004-5082, 10000-20000, 4569, 2727

PBX In A Flash



- PBX Opening Panel
- Admin Access
- Flash Panel
- Conferencing

FreePBX

- FreePBX interface
- System Status
- Update Modules

The screenshot displays the FreePBX System Status page. The interface includes a navigation menu on the left with options like Admin, Setup, Tools, and various system administration tasks. The main content area is titled 'FreePBX System Status' and contains several sections:

- FreePBX Notices:** A section with a 'show all' link.
- FreePBX Statistics:** A table showing call and channel statistics.

Category	Count
Total active calls	1
Internal calls	0
External calls	1
Total active channels	2
- FreePBX Connections:** A table showing online phones and trunk registrations.

Category	Count
IP Phones Online	9
IP Trunks Online	2
IP Trunk Registrations	1
- Uptime:** A section showing system and Asterisk uptime, and the last reload time.

System Uptime: 30 weeks, 4 hours, 16 minutes
Asterisk Uptime: 30 weeks, 4 hours, 15 minutes
Last Reload: 19 seconds
- System Statistics:** A section showing processor load, memory usage, disks, and networks.

Category	Value
Processor	
Load Average	0.12
CPU	100%
Memory	
App Memory	39%
Swap	0%
Disks	
/	1%
/boot	10%
/dev/shm	0%
Networks	
eth0 receive	21.97 KB/s
eth0 transmit	22.50 KB/s
eth1 receive	0.00 KB/s
eth1 transmit	0.00 KB/s
- Server Status:** A section showing the status of various services.

Service	Status
Asterisk	OK
Op Panel	OK
MySQL	OK
Web Server	OK
SSH Server	OK

A hand icon is drawn over the System Statistics section, pointing to the CPU usage bar.

General Settings

FreePBX 2.5.2.2 on 70.96.89.45

Admin Reports Panel Recordings Help

Setup Tools English

Admin

FreePBX System Status

Module Admin

Base

Extensions

Feature Codes

General Settings

Outbound Routes

Trunks

Administrators

Inbound Call Control

Inbound Routes

Zap Channel DIDs

CallerID Lookup Sources

Follow Me

IVR

Ring Groups

Time Conditions

Time Groups

Internal Options & Configuration

Callback

Misc Applications

Misc Destinations

Music on Hold

System Recordings

Dialing Options

Asterisk Dial command options: tr

Asterisk Outbound Dial command options:

Call Recording

Extension Recording Override: Disabled

Call recording format: wav

Recording Location:

Run after record:

Voicemail

Ringtime Default: 15

Direct Dial Voicemail Prefix: +

Direct Dial to Voicemail message type: Unavailable

Optional Voicemail Recording Gain:

Do Not Play "please leave message after tone" to caller:

Voicemail VmX Locator

Default Context & Pri: from-internal context 1 pri

Timeout/#-press default: context dovm exten 1 pri

Loop Exceed default: context dovm exten 1 pri

Timeout VM Msg: Std Instructions

Max Loop VM Msg: Std Instructions

Direct VM Option: Std Instructions

Msg Timeout: 2 seconds

Msg Play: 1 times

Error Re-tries: 1 times

Company Directory

Find users in the Company Directory by: last name

Announce Extension:

Operator Extension:

Fax Machine

Extension of fax machine for receiving faxes: system

Email address to have faxes emailed to: fax@mydomain.com

Email address that faxes appear to come from: freepbx@gmail.com

International Settings

Country Indications: United States / North America

24-hour format: yes

Security Settings

Allow Anonymous Inbound SIP Calls?: no

Online Updates

Check for Updates: Yes

Update Email: rswift@swiftstaffing.com

Submit Changes

FreePBX Let Freedom Ring

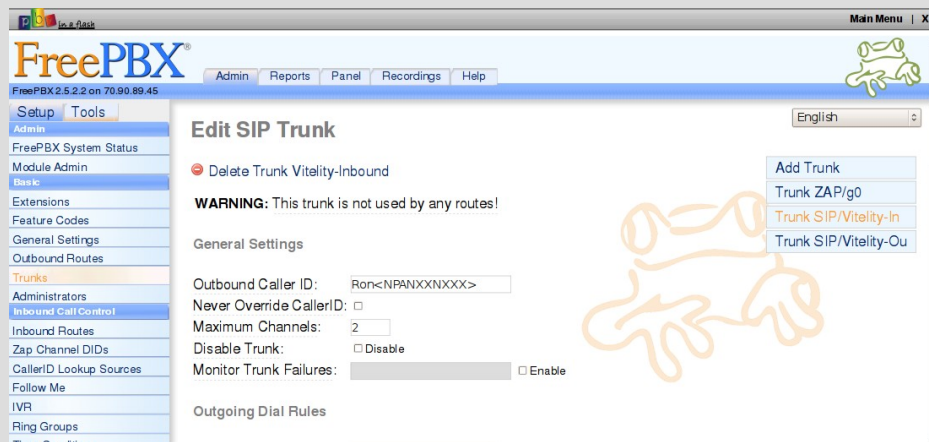
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- Default settings
- Email for updates
- Don't allow anonymous inbound sip calls

Inbound Trunk

- Settings from VOIP Provider
- DID Callerid
- Peer Details
- Registration string



The screenshot displays the FreePBX administration interface. The top navigation bar includes 'Admin', 'Reports', 'Panel', 'Recordings', and 'Help'. The sidebar menu on the left is organized into sections: 'Setup' (Tools, Admin, FreePBX System Status, Module Admin), 'Basic' (Extensions, Feature Codes, General Settings, Outbound Routes), 'Trunks' (Administrators, Inbound Call Control, Inbound Routes, Zap Channel DIDs, CallerID Lookup Sources, Follow Me, IVR, Ring Groups), and 'Tools' (Trunk Settings, Trunk Status). The main content area is titled 'Edit SIP Trunk' and features a 'Delete Trunk Vitality-Inbound' button with a red warning icon. A prominent warning message states: 'WARNING: This trunk is not used by any routes!'. Below this, the 'General Settings' section includes fields for 'Outbound Caller ID' (containing 'Ron<NPANXXNXXX>'), 'Never Override CallerID' (checkbox), 'Maximum Channels' (set to 2), 'Disable Trunk' (checkbox, currently unchecked), and 'Monitor Trunk Failures' (checkbox, currently unchecked). An 'Outgoing Dial Rules' section is also visible at the bottom. A context menu is open over the 'Trunk SIP/Vitality-In' link, showing options: 'Add Trunk', 'Trunk ZAP/g0', 'Trunk SIP/Vitality-In', and 'Trunk SIP/Vitality-Ou'. A faint orange hand-drawn outline is visible in the background of the settings area.

Outbound Trunk

The screenshot displays the 'Edit SIP Trunk' configuration page in the FreePBX 2.5.2.2 administration interface. The page is titled 'Edit SIP Trunk' and includes a sidebar menu on the left with categories like 'Setup', 'Tools', 'Admin', and 'Trunks'. The main content area features a 'Delete Trunk Vitality-Outbound' button, a language dropdown set to 'English', and a 'General Settings' section. The 'General Settings' section includes the following fields and options:

- Outbound Caller ID: Ron<4107887011>
- Never Override CallerID:
- Maximum Channels: 4
- Disable Trunk: Disable
- Monitor Trunk Failures: Enable

Below the 'General Settings' section, there are sections for 'Outgoing Dial Rules' and 'Dial Rules'. A hand-drawn orange scribble is overlaid on the page, partially obscuring the 'General Settings' section.

- Peer call settings
- VOIP Provider Specific
- No Register String

Inbound Route

FreePBX 2.5.2.2 on 70.90.89.45

Admin Reports Panel Recordings Help

Setup Tools English

Route: Swift_Toll_Free

Delete Route Swift_Toll_Free

Add Incoming Route

View All DIDs

View User DIDs

View General DIDs

View Unused DIDs

Edit Incoming Route

Description: Swift_Toll_Free

DID Number:

Caller ID Number:

CID Priority Route:

Options

Alert Info:

CID name prefix:

Music On Hold: Default

Signal RINGING:

Pause Before Answer:

Privacy

Privacy Manager: No

Fax Handling

Fax Extension: FreePBX default

Fax Email:

Fax Detection Type: None

Pause After Answer:

CID Lookup Source

Source: Callerid Superfecta

Set Destination

Terminate Call: Hangup

Extensions: <5001> Receptionist

Voicemail: <5001> Receptionist (busy)

IVR: Swiftmain

Submit Clear Destination & Submit

FreePBX Let Freedom Ring

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- Determines how inbound calls are handled
- Callerid
- Fax Features
- Set Call Destination – Extension, Ring Group, IVR, Queue

Outbound Route



The screenshot displays the FreePBX administration interface. The top navigation bar includes 'Admin', 'Reports', 'Panel', 'Recordings', and 'Help'. The left sidebar contains a menu with categories like 'Admin', 'Basic', 'Extensions', 'General Settings', 'Outbound Routes', 'Trunks', 'Administrators', 'Inbound Call Control', 'Inbound Routes', 'Zap Channel DIDs', 'CallerID Lookup Sources', 'Follow Me', 'IVR', 'Ring Groups', 'Time Conditions', 'Time Groups', 'Internal Options & Configuration', 'Callback', 'Misc Applications', 'Misc Destinations', 'Music on Hold', and 'System Recordings'. The main content area is titled 'Edit Route' and shows the configuration for a route named 'Swift'. The configuration includes fields for 'Route Name', 'Route Password', 'Emergency Dialing', 'Intra Company Route', and 'Music On Hold?'. A 'Dial Patterns' list contains various patterns such as '911', '1800NXXXXX', '1866NXXXXX', '1877NXXXXX', '1888NXXXXX', '1NXXXXXXX', 'NXXNXXXXXX', and 'NXXXXXX'. Below the list are buttons for 'Clean & Remove duplicates' and a 'Dial patterns wizards' dropdown. The 'Trunk Sequence' is set to '0 SIP/Itelity-Outbound'. A 'Submit Changes' button is at the bottom. The FreePBX logo and tagline 'Let Freedom Ring' are visible at the bottom left.

- Dial plan
- Trunk to use

Extensions

The screenshot shows the FreePBX web interface. The top navigation bar includes 'Admin', 'Reports', 'Panel', 'Recordings', and 'Help'. The left sidebar lists various administrative options, with 'Extensions' highlighted. The main content area is titled 'Add an Extension' and contains the following elements:

- A message: 'Please select your Device below then click Submit'
- A 'Device' dropdown menu currently set to 'Generic SIP Device'.
- A 'Submit' button.
- A list of existing extensions with the following entries:
 - Receptionist <5001>
 - Dean Swift <5003>
 - Michael Jamison <5004>
 - Ron Swift <5005>
 - Tasha Turner <5006>
 - Kitchen <5007>
 - Dean Home <5103>
 - Michael - Home <5104>
 - Ron - Home <5105>
 - Tasha - Home <5106>
 - Ron - SwiftTime <5205>

A hand-drawn orange arrow points from the 'Add Extension' button in the list to the 'Add Extension' button in the form.

- Don't use 70-79, 700-799 or 7777
- Add Generic SIP
- Extension
- Display name
- Secret
- Voicemail w/email notification

Follow Me Feature

The screenshot shows the FreePBX web interface for configuring the 'Follow Me' feature for extension 5005. The interface includes a sidebar with navigation options, a main content area with various settings, and a 'Destination if no answer' section. A hand-drawn orange figure is overlaid on the page.

FreePBX 2.5.2.2 on 70.90.89.45

Admin Reports Panel Recordings Help

Setup Tools English

Follow Me: 5005

Edit Extension 5005

Delete Entries

Edit Follow Me

Disable:

Initial Ring Time: 0

Ring Strategy: ringallv2

Ring Time (max 60 sec): 20

Follow-Me List: 5005, 4109611943#

Extension Quick Pick: (pick extension)

Announcement: None

Play Music On Hold?: default

CID Name Prefix:

Alert Info:

Confirm Calls:

Remote Announce: Default

Too-Late Announce: Default

Destination if no answer:

Terminate Call: Hangup

Extensions: <5001> Receptionist

Voicemail: <5005> Ron Swift (unavail)

IVR: Swiftmain

Submit Changes

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- Add to Extensions
- Calls can go to multiple devices
- Ring strategy
- Ring Time
- Destination if no answer

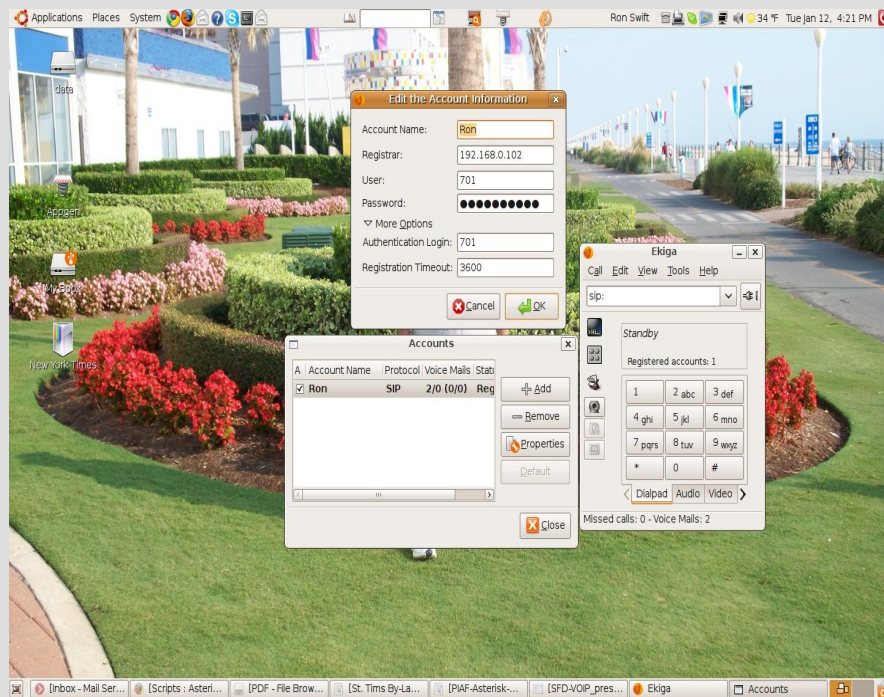
IVR Digital Receptionist



The screenshot displays the FreePBX administration interface. The top navigation bar includes 'Admin', 'Reports', 'Panel', 'Recordings', and 'Help'. The left sidebar lists various configuration categories, with 'IVR' highlighted. The main content area is titled 'Digital Receptionist' and shows the configuration for 'Swiftmain'. A large orange hand-drawn graphic of a receptionist is overlaid on the page. The configuration includes fields for 'Change Name', 'Announcement', 'Timeout', 'Enable Directory', 'VM Return to IVR', 'Directory Context', 'Enable Direct Dial', 'Loop Before t-dest', 'Timeout Message', 'Loop Before i-dest', 'Invalid Message', and 'Repeat Loops'. Below these are three sections for 'Return to IVR' options, each with radio buttons for 'Terminate Call', 'Extensions', 'Voicemail', and 'IVR'. The 'Voicemail' option is selected in the first section. The bottom of the page features the FreePBX logo and the slogan 'Let Freedom Ring'.

- Incoming Calls Automation
- Recorded Greetings
- Route to Extensions, Departments, Voicemail
- Queue
- Route by Time of Day

Sip Phone Setup



- Use Soft or Hard Phones
- Features Vary
- Server IP
- Extension
- Secret

Bells and Whistles

- Fax
- Integrate with CRM
- News and Weather Reporting
- Record Calls
- Wake up Calls
- Connect Multiple Locations
- Free Calls

Summary

- Plan your system
- Hosted and commercial options available
- Security is key as VOIP becomes more widely used.
- Broadband – Comcast, FIOS, T-1
- Setup is simple with PBX in a Flash iso
- Phone, Router, and VOIP Provider
- Feature rich and cost effective system
- PIAF Without Tears - Reference

Appendix

- SIP
- DID
- POTS
- QOS
- POE
- Enum
- Orgasmatron