

Innovative Applications Using Asterisk Open Source PBX

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Introduction

- **Asterisk provides a unique and very powerful platform to enable converged applications.**
 - Asterisk is open source and runs on and is compatible with other Linux-based technologies. (i.e. PERL, PHP/MySQL, etc...)
 - Asterisk is IP-based, allowing easy integration to other Internet Technologies (i.e. RSS/XML, HTTP, SMTP, etc...)
 - Asterisk through the use of TDM cards, ATA's or SIP Gateways, provides a 'gateway' for users to connect from their phones to the digital world of applications, databases and onward to the Internet.



Introduction

- **Asterisk's undisputable selling point is its customizability.**
 - With open standards and open source, only Asterisk offers UNLIMITED customization.
 - Even the most expensive most feature-rich VoIP Solution cannot claim this.
 - Not only is Asterisk customizable, it is *relatively easy to use and learn*.
 - Any person with a background in Linux and one or two programming Linux-compatible programming languages can learn to develop Asterisk applications in a few weeks.
- **The key point is: *Asterisk is much much more than a free PBX!!!***



Development Tools

- **The Dialplan**
 - The essence of an Asterisk PBX is its dialplan.
 - A lot of creative programming can already be done by just using the basic dial plan commands. i.e. IVR applications.
- **The Asterisk Gateway Interface**
 - AGI allows other scripting/programming languages to interact with Asterisk.
 - Typically used to interface with Databases and other external applications.
 - Compatible with most modern programming languages, although PHP/PERL/Python are more commonly used.



Development Tools

- **The Asterisk RealTime Architecture**

- Available in version 1.2 up, ARA allows more seamless access to SQL Databases.
- Reduces instances where system requires reloading allowing for 'realtime' Asterisk configurations 'on the fly'.
- Asterisk configuration in a database makes it easier to integrate GUI applications for asterisk management

- **Manager API**

- The Asterisk Manager allows a client program to connect to an Asterisk instance and issue commands or read PBX events over a TCP/IP stream.
- Provides a virtually unlimited possibility of applications that can be developed in any programming language to interact with Asterisk.
- Examples would include: Predictive Dialers, Operator/Receptionist Control Panels, and much more....



EACOMM's Asterisk Development Efforts

Completed Projects:

- Hosted PBX Platform with complete set of PBX features managed by clients in real time. Includes all standard PBX functionality + optional call center applications (i.e. ACD/Predictive Dialer)
- Calling Card/Pre-paid VoIP platform
- SMS Gateway – Asterisk Integration
- Various IVR Applications (Email, RSS, Recording, wake-up call, etc...)
- Click-to-Call Applications

Projects under development:

- Web-based Softphone
- Jabber/Googletalk/Skype-Asterisk Integrated platform

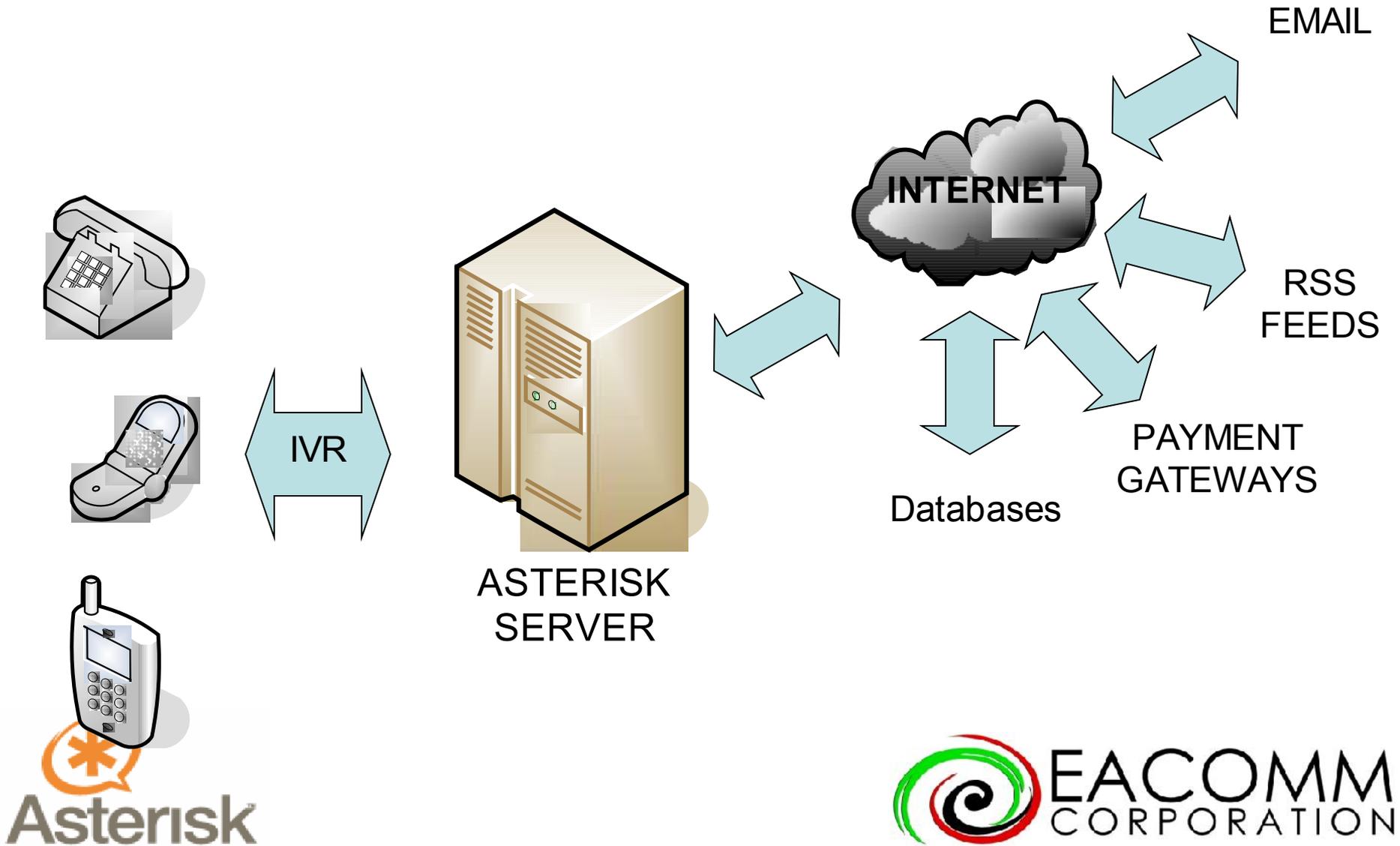


IVR Applications

- IVR or Interactive Voice Response allows users to interact with your phone system, providing a 'User Interface' to access PBX features, Internet data, and more...
- The typical application is a redirection menu: i.e. "Press One to contact Sales, Press Two to contact Tech Support" – But with ASTERISK, you can develop much more than this.



IVR Applications



IVR Applications

- Over the Phone Credit Card Verification/Phone Banking
 - Application automatically records (or Agent accepts) relevant info such as name, address, etc...
 - Client punches in his credit card number, expiration date, etc...
 - Server connects to the Payment Gateway via Phone/Internet and confirms the data.
 - IVR confirms if card is validated successfully.



IVR Applications

- **Recording Information for Transcription**

- Client calls and enters a userid and pin supplied by transcription company
- IVR forwards to a voicemail-type application and client records the information
- Client can review, delete, overwrite, or submit his recording
- Recording is stored in an online database and/or emailed to transcription company.
- Alternately, Speech-to-text engine can be enable for *automated* transcription. (Technology still in infancy)



IVR Applications

- RSS News feeds Over the Phone
 - User can select what type of information he wants to access over the phone via a web interface
 - User calls into IVR, selects either local news, weather, stock quotes, etc...
 - Asterisk Server extracts RSS data from the Internet and plays back to the user using Text-to-Speech Technology.



IVR Applications

- Email Over the Phone
 - User Contacts the IVR and enters a userid and pin.
 - Asterisk downloads email data corresponding to entered userid
 - Text-to-Speech engine outputs the Email content to the user



IVR Applications

- Learning Applications
 - IVR directs to either Lessons or Quizzes
 - Text-to-speech or pre-recorded messages play out the lesson or quiz question
 - User can answer quizzes by pressing the corresponding answers to question (i.e. for a Math Quiz) or presses the number corresponding to the correct choice (i.e. Multiple Choice/True or False Quiz)

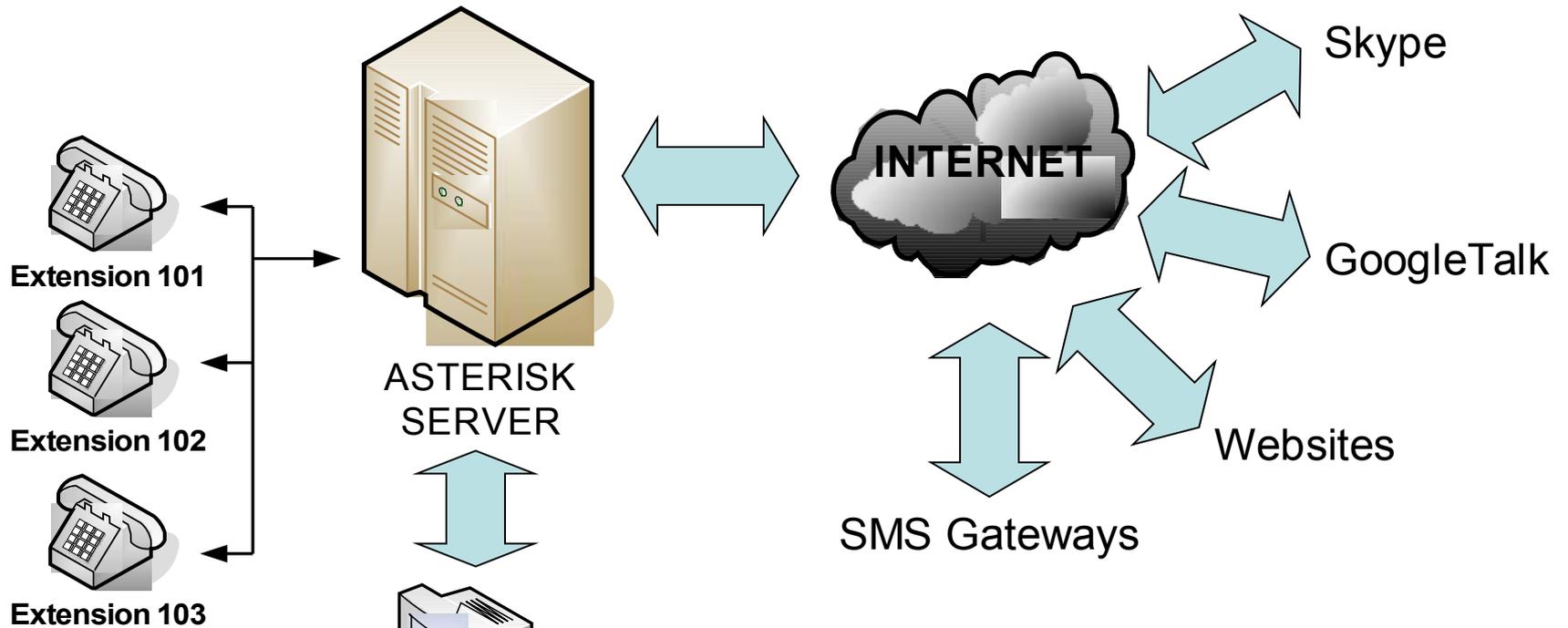


IVR Applications

- Phone Surveys
 - Agent calls the respondents and forwards them to the Survey IVR.
 - IVR plays out survey questions and users answer by typing the values on their handsets.
 - Answers are stored into a database
- Games?
 - A perfect example of the power of Asterisk's IVR module would be this adaptation of the popular Zork Text-based adventures of the early 80's:
<http://uc.org/read/ZoIP>



Asterisk integration with other applications



OUTLOOK/CRM Software



Asterisk integration with other applications

- **Skype-to-Asterisk**

- Enables Skype users to call into an Asterisk Server and vice versa
- Can be achieved by utilizing Skype-enable ATA devices connected to a TDM Card with FXO Ports
- Software solution also available such as what is provided by <http://chanskype.com>

- **Googletalk-to-Asterisk**

- With Asterisk Version 1.4, integration with GoogleTalk Instant messenger is now possible through Jingle and Jabber protocols.



Asterisk integration to other applications

- **Asterisk-Outlook integration**
 - Allows users to select phone numbers from MS Outlook and dial out using the asterisk server.
 - Various open source and licensed solutions available: i.e. AstTAPI, Third Lane Outlook Dialer.



Asterisk integration to other applications

- **SMS/Asterisk Integration**

- Done by integrating an online SMS gateway to your Asterisk Server or by using a VoIP GSM Gateway
- Example applications would be Voicemail notices via SMS, Server usage statistics via SMS, etc...
- Online SMS gateways typically charge around Php 3.00 to send an SMS to any Country with a GSM network.

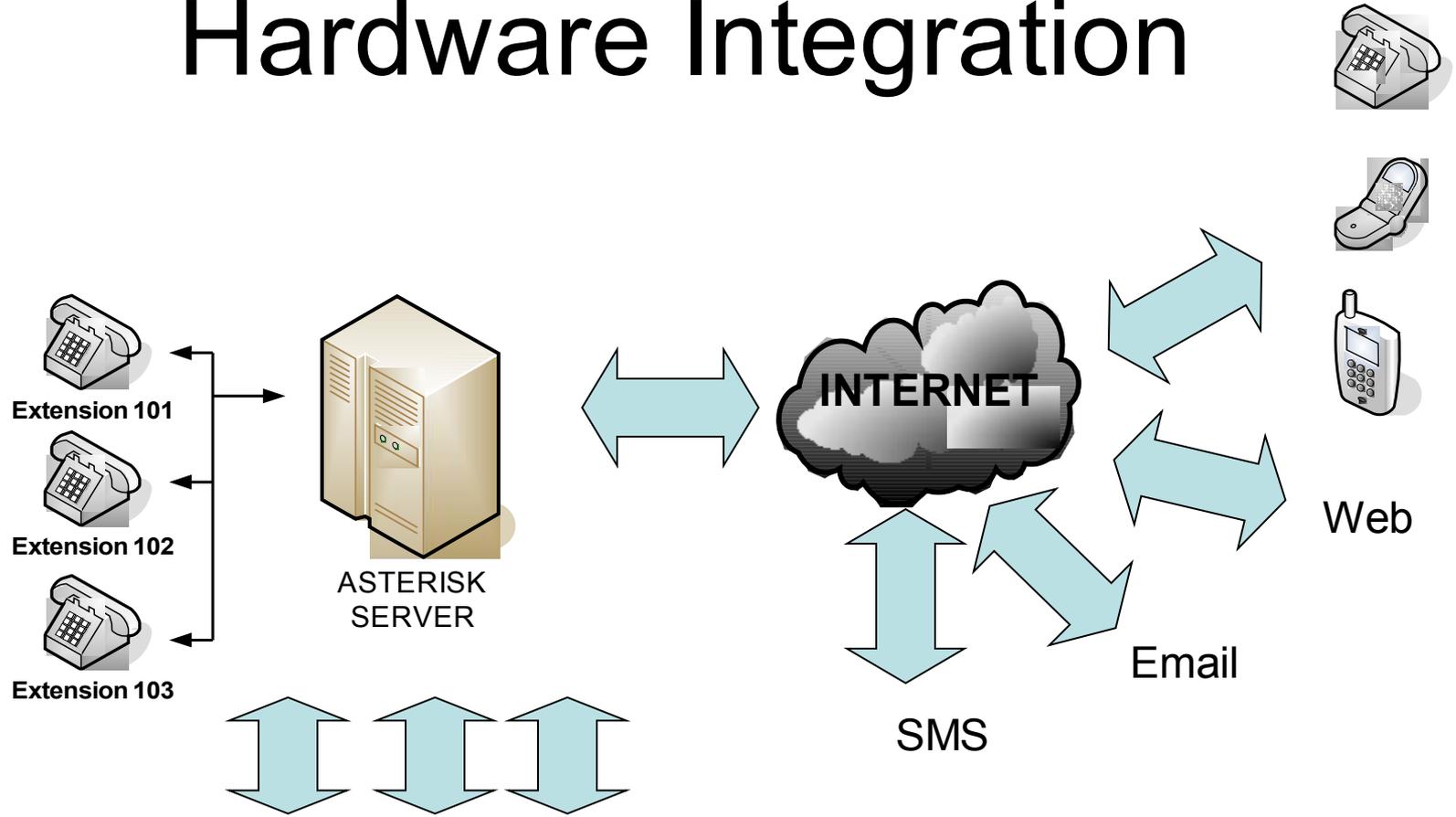


Asterisk integration to other applications

- Click-to-Call
 - Highly touted as the ‘next stage’ of Web Advertising – Users click on a website’s phone number and can automatically contact the website’s owners.
 - Google is currently running a test of this in its Adwords products
 - Easily done using Skype...but site visitor needs Skype installed.
 - Using purely Asterisk:
 - Upon clicking a phone number in the website, a popup window opens and prompts the user for his/her phone number
 - Asterisk validates if calls are allowed from the country/location of the caller and if anyone is available to answer the call
 - If valid, Asterisk contacts the Call Agent AND the Caller via the entered phone number.
 - Website owner shoulders the caller’s call charges



Hardware Integration



Alarm Systems, Home
Automation, Phone Alarms

Hardware Integration

- **Bluetooth “follow me application” - Automatically diverts calls from Standard Extension to mobile phone using Bluetooth presence detection.**
- **Use Asterisk as a PA-system - Dial an extension and access a PA system connected to the server’s sound card.**
- **Connect a Door Phone to Asterisk and answer people knocking on your door from anywhere on earth.**



Hardware Integration

- **Attach traditional phone-based alarm systems to Asterisk to receive prompts via web/email/sms/phone**
- **Home Automation – control home appliances/doors/etc via an IVR. i.e. call your asterisk server to turn on the airconditioning, turn on/off lights, lock/unlock doors, etc....**



What the Future Holds

- **Improved speech-to-text / text-to-speech**
- **Improved Video Calling/Conferencing**
- **Hi-Fi Voice Calls**
- **Free calls to anywhere/anyone**
- **Integration of Wi-Fi and Cellular technology**
- **VoIP and nothing else**



On-line Resources

- **Nerdvittles.com**
 - Dozens of Asterisk/Trixbox related projects
- **voip-info.org**
 - Probably the most comprehensive site about Asterisk
 - <http://www.voip-info.org/wiki/view/Asterisk+bounty>
 - A list of Asterisk-related projects with corresponding rewards for those choosing to tackle them.
- **www.asteriskdocs.org**
 - The ‘official’ manual on Asterisk
 - Best place to start learning Asterisk



THANK YOU

