Asterisk As IVR Server

Description

IVR or **Interactive Voice Response** is the art of automating routine and repetitive communication tasks that would otherwise be serviced by operators, agents or other employees. The most frequently cited example of IVR is the "bank-by-phone" application offered by many banks. Other examples include automated flight confirmations, service activations, credit card payments, and even call routing (often referred to as "automated attendant").

IVR saves businesses money by handling tasks that would otherwise take the time and attention of a human. IVR applications receive input from the caller as digits (using the telephone keypad) or using speech recognition. Most IVR systems connect with a remote data source like a relational database, corporate directory or web service.

Traditional IVR systems are built on top of expensive proprietary voice engines which in turn are built on expensive proprietary telephony hardware. Asterisk simplifies the process of building an IVR and reduces the costs significantly. Asterisk's dialplan scripting language includes commands to play recorded prompts, to collect digits or spoken responses and to reply with synthesized or recorded responses. Just as importantly, the dialplan language incorporates commands for reading from and writing to a number of data sources including databases, web services, LDAP directories and calendaring data stores.

The Asterisk voice engine is open source and is available free of charge to all. Asterisk-based IVR systems that connect over VoIP require no special hardware or software licenses.

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Supported Scenarios

- Network IVR, connected directly to PSTN or VoIP trunks.
- Behind The Switch, connected to a PBX via VoIP or using legacy technologies.

Features

- Playback and recording of audio in multiple formats, including HD formats.
- DTMF detection and collection.
- ODBC database access.
- Web service access.
- LDAP data access.
- Calendaring data access.
- Speech synthesis and recognition (requires 3rd party add-on components).
- Branching and logic operations (if/then, while, for/next, etc.).

Benefits

- Improve customer interactions by providing 24 hour access to basic automated services.
- Reduce payroll costs or re-purpose employees to handle more valuable tasks.

Components

The components required to create a conference server with Asterisk range from the basic (simply a computer running Asterisk for VoIP-only systems) to slightly more complex for systems that integrate with either the PSTN or a legacy PBX. Most implementations require a combination of the following:

- Generic x86 computer platform (server or desktop)
- Linux operating system
- Asterisk telephony engine
- Digium digital or analog interface card(s)
- Interface cable(s) to legacy system

The computer can be any standard x86 (Intel or AMD) computer. The system will need to include either PCI or PCI-Express expansion slots. If the system will be connected to any legacy telephony interfaces (public or private) the chassis must be large enough to accommodate the interface cards. The system should be at least a Pentium IV or equivalent for a small IVR syste (up to 8 parties connected over SIP or analog ports). Larger applications and applications that require transcoding (translation of the audio media from one format to another) will require more powerful hardware.

The operating system can be virtually any modern 2.6-series distribution of Linux. Digium recommends the AsteriskNOW distribution, which comes with Asterisk and the interface card drivers pre-installed. Digium offers support subscriptions for systems running RedHat Enterprise Linux 4/5, CentOS Linux 4/5, Ubuntu Server Long Term Support (LTS), Debian stable (currently "Lenny"), SUSE Enterprise Linux 10/11 and OpenSUSE 10/11.

The current Asterisk release is available as a binary installation for the RedHat and CentOS family of Linux distributions, and comes pre-installed on the AsteriskNOW distribution. It can be installed from source code with a few simple commands on any other supported Linux distribution. Details on downloading and installing Asterisk or the AsteriskNOW distribution are available at www.asterisk.org.

Company	Product	Price	Per Port Price
Cisco	Cisco IP IVR Software, VoIP, 5 Ports*	$11,786.99	$2,357.00
Digium	Asterisk Conference Bridge with 96/120 Ports (4 T1/E1)	$3,495.00	$32.00

* Does not include the required cost of Cisco CallManager hardware and software, license only.

Table 1. Cost comparison of commercial IVR solutions

Interface cards are required to tie the IVR server in with legacy telephony technologies. To connect a PBX with analog station ports or to connect directly to analog PSTN lines, the system will need one or more Digium analog card. Connections to larger scale legacy systems or the PSTN over digital T1 or E1 connections require a Digium single, dual or quad-spand digital card. Connection to ISDN-BRI PBX station ports or ISDN-BRI lines is accomplished using a Digium BRI or analog/BRI hybrid card.

Comparison With Commercial IVR Solutions

Assembling an IVR solution from Asterisk and a standard Linux computer can save significantly over the cost of purchasing a commercial system. For example, the table above compares the cost of building an Asterisk-based server with 96 connections to a PBX over four T1 spans (or 120 connections over four E1 spans) plus multi-protocol VoIP support with an IVR solution from Cisco.

Asterisk Gateway Component Prices

$1,200 – Server Computer with Quad Core Intel Xeon (estimated)

$1,700 – Digium Quad Span (4 T1/E1) Interface Card w/ Hardware Echo Cancellation (estimated)

$0.00 – Linux Operating System

$0.00 – Asterisk Telephony Engine

$595.00 – Digium L1 Support Subscription

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More Information

To download Asterisk or AsteriskNOW or for more information on how to create a VoIP gateway or other solution with Asterisk, see: www.asterisk.org

To buy Digium interface cards, support subscriptions, add-on software, check out the Digium web store at: **http://store.digium.com** or contact Digium to find a reseller in your area.

For information on Digium's complete line of Asterisk training courses, visit **www.digium.com/en/training**

For information on support subscriptions for Asterisk, visit **www.digium.com/en/support**

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