

Be Your Own Phone Company With Asterisk!

Andrew Poland
<ajpoland@iupui.edu>

What is Asterisk?

Complete Private Branch Exchange (PBX) implemented in software

Telephone “Application Server”

Supports PSTN and VOIP networks

Open Source

Uses

Interactive Voice Response (IVR)
Applications

Call centers - Incoming or Outgoing
Voicemail Server

Conference calling

Bridge distant locations

Customized solutions - - be creative!

Features

ADSI On-Screen Menu System Alarm Receiver Append Message
Authentication Automated Attendant Blacklists Blind Transfer Call Detail
Records Call Forward on Busy Call Forward on No Answer Call Forward
Variable Call Monitoring Call Parking Call Queuing Call Recording Call
Retrieval Call Routing (DID & ANI) Call Snooping Call Transfer Call Waiting
Caller ID Caller ID Blocking Caller ID on Call Waiting Calling Cards
Conference Bridging Database Store / Retrieve Database Integration Dial by
Name Direct Inward System Access Distinctive Ring Do Not Disturb E911
ENUM Fax Transmit and Receive Flexible Extension Logic Interactive
Directory Listing Interactive Voice Response (IVR) Local and Remote Call
Agents Macros Music On Hold Music On Transfer Flexible Mp3-based
System Random or Linear Play Volume Control Predictive Dialer Privacy
Open Settlement Protocol (OSP) Overhead Paging Protocol Conversion
Remote Call Pickup Remote Office Support Roaming Extensions Route by
Caller ID SMS Messaging Spell / Say Streaming Media Access Supervised
Transfer Talk Detection Text-to-Speech (via Festival) Three-way Calling
Time and Date Transcoding Trunking VoIP Gateways Voicemail Visual
Indicator for Message Waiting Stutter Dialtone for Message Waiting
Voicemail to email Voicemail Groups Web Voicemail Interface Zapateller

Telephony Hardware

Zaptel Cards - - POTS (Plain old telephone service)

FXO

FXS

T1

Voice over IP (VOIP)

IAXy (IAX protocol)

SIP (Cisco, Linksys, IP phones)

Codecs

G.711 ulaw – 64kbit

G.711 alaw – 64kbits

G.726 ADPCM – 16/24/32/40 kbit

G.729 – 8kbit, requires license

GSM – 13kbit, cell phones

iax.conf

```
[general]
```

```
register => username:password@voip-co2.teliix.com
```

```
[teliix]
```

```
context=incoming
```

```
type=friend
```

```
host=voip-co2.teliix.com
```

```
auth=md5
```

```
secret=password
```

```
disallow=all
```

```
allow=ulaw
```

```
allow=alaw
```

```
allow=gsm
```

More iax.conf

```
[iaxy]
type=friend
accountcode=iaxy
host=dynamic
secret=password
context=iaxy
disallow=all
allow=ulaw
callerid="Monkey Jones" <(317) 489-5355>
trunk=no
```

extensions.conf

[globals]

OUTBOUND_TRUNK= IAX2/ fiznarp1 @teliax

[incoming]

exten => 3174895355,1,Answer

exten => 3174895355,n,Wait,2

exten => 3174895355,n,Goto(vote,s,1)

[iaxy]

exten =>

_1XXXXXXXXXX,1,DIAL(\${OUTBOUND_TRUNK}/ \${EXTEN},30,tr)

exten => 200,1,Goto(test,s,1)

exten => 300,1,Goto(extensions,s,1)

exten => 400,1,Goto(vote,s,1)

Festival

Open Source text to speech tool

<http://www.cstr.ed.ac.uk/projects/fest>

festival_server

Test the IAXy (extension 200)

[test]

```
exten => s,1,Festival('This is a test. This is only a  
test.')
```

```
exten => s,n,Playback(all- your- base)
```

```
exten => s,n,Hangup()
```

IVR Example (extension 300)

[extensions]

exten => s,1,Playback(welcome)

exten => s,n,Set(TIMEOUT(digit)= 5)

exten => s,n,Set(TIMEOUT(response)= 10)

exten => s,n,Festival('Dial 1 to talk to Andrew.')

exten => s,n,Festival('Dial 2 to talk to Keith.')

exten => s,n,WaitExten

exten => s,n,Hangup()

exten => 1,1,Dial(IAX2/iaxy/s) ; Dial Andrew's IAXy

exten => 2,1,Dial(\${OUTBOUND_TRUNK}/3175551212) ; Dial
Keith's Cell phone

PHP/ MySQL Demo (ext 400)

[vote]

exten => s,1,Playback(welcome)

exten => s,n,Wait(2)

exten => s,n,Festival('Press one to vote for Rich.')

exten => s,n,Festival('Press two to vote for Chris.')

exten => s,n,Festival('Press three to vote for Keith.')

exten => s,n,Festival('Press four to vote for Jbe.')

exten => s,n,Festival('Press five to vote for Cowboy Neal.')

exten => s,n,agi,vote.agi ; Calls /var/lib/asterisk/agi-bin/vote.agi

exten => s,n,Playback(goodbye)

exten => s,n,Hangup()

```
// vote.agi
#!/usr/bin/php -q

write("WAIT FOR DIGIT 60000");
$result = read();
$ascii = split("=", $result); $digit = chr($ascii[1]);

if($digit >= 1 && $digit <= 5) {
    errlog("Recording a vote for - $digit");
    write("EXEC PLAYBACK recordingyourvote");
    read();
    $query= "INSERT INTO votes VALUES('$digit')";
    errlog("query: $query");
    mysql_query($query);
    write("SAY NUMBER $digit X"); read();
    write("EXEC PLAYBACK thankyouforvoting");
    read();
} else {
    errlog("$result: invalid");
    write("EXEC PLAYBACK youenteredaninvaliddigit");
    read();
}
```

For more info

<http://www.digium.com>

<http://www.voip-info.com>

<http://www.asteriskdocs.com>