What you didn't know your phone could do...

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Clod Patry / AMUG
Getting from A to Z
Adventure games for your PBX

West of House
You are standing in an open field west of a white house, with a boarded front door.
There is a small mailbox here.
>
About Me
Simon Ditner
From Toronto
Organizer for TAUG
We're at booth 405
What I Do
Write software
Leverage open source
Linux
Apache
MySQL
PostgreSQL
Asterisk
Interested in HCI
(human computer interaction)
Particularly
Novel ways of viewing
and accessing information
Today's Theme

Things previously not feasible

- Due to cost
- Lack of access to technology
- Disconnect between I.T. and Telecom
- Preconceptions about what can be done
The future is here
Everything is obvious
And relatively trivial
Only surprising
Due to limited options in past
Recent
(in telco terms)
Changes
Insane amounts of bandwidth
VoIP standards like SIP, H.323, IAX2 taking hold
Commoditization of telephony hardware
Packetization of voice
Voice processed & routed like data
FXS  Ethernet
Fog around VoIP has lifted
VoIP apps no longer vapour
Can be used for real work
Open Source making it easier
Applications we'll explore

• Playing text adventures over the phone
• Altering your voice on the fly
• Conference call manager
Budget for these projects:
$0.00
My goal...
Play Zork over the telephone
Zork

- Text-based game from the late 1970's
- Before graphical computer games
- Similar to choose-your-own adventure books
- Runs on the Z-Machine
Z-Machine

- Byte code interpreter
- Write once, run anywhere
- Similar concept to Java
An sample dialogue
The door reluctantly opens to reveal a rickety staircase descending into darkness.
>go down
You have moved into a dark place.
The trap door crashes shut, and you hear someone barring it.
It is pitch black. You are likely to be eaten by a grue.
>turn on lantern
The brass lantern is now on.
Cellar
You are in a dark and damp cellar with a narrow passageway leading north, and a crawlway to the south.
On the west is the bottom of a steep metal ramp which is unclimbable.
The Troll Room
This is a small room with passages to the east & south. Bloodstains & deep scratches mar the walls.
A nasty-looking troll, brandishing a bloody axe, blocks all passages out of the room.
The axe gets you right in the side. Ouch!
My toolbox

- Asterisk  (:-)
- Z-Machine  (bytecode interpreter)
- Sphinx2  (speech recognition)
- Festival  (text to speech)
- Perl  (scripting language)
Briefly
Asterisk is 3 things

- An IVR
  - Interactive Voice Response
- A PBX
  - Private Branch Exchange
- A Media Gateway
  - Convert calls from different formats and protocols (G.711, G.729; SIP, IAX2, SCCP)
Asterisk is extensible

- AGI
  - Asterisk Gateway Interface
- Manager API
  - A socket based event and control channel
- C Modules
  - Embedding your software into Asterisk
What I'm using out of this

- IVR (Interactive Voice Response)
- AGI (Asterisk Gateway Interface)
How does AGI make it extensible?

- Launches any external program
- Provides command path over STDIN/STDOUT
- Audio available over file descriptor 3 (EAGI only)
getting from A to Z
increments
built simple applications
retrieve weather & read back
“Today, cloudy with a high of 21…”
simple DTMF
“you pressed 1, 2, 3”
Chose a Z-Machine

- Found Rezrov, written in perl
- Open source
- I/O is abstracted from the actual Z-machine
Capture Output

• Collect text that would have been printed to the screen
• Pipe through Festival
• Tell asterisk to play the file using the command path
Capture Input

- Collect DTMF digits
- Translate numbers to words
- Send to Z-Machine over command path
Experiment with Sphinx2

- Capture audio in Asterisk
- Wait for pause in speaking
- Send audio to Sphinx2
- Collect recognized text
- Type it in to Zork as if from keyboard
Capture Output

- Collect text that would have been printed to the screen
- Pipe through Festival
- Tell asterisk to play the file using the command path
[Demo]
Time invested:
48 hours
Taking it further...
Open source developers are accessible
Ran into Kevin Lenzo at Astricon
Developer for Festival
And Sphinxx2
Details on building better grammars
Contacted author of Rezrov
Details on extracting vocab and grammar from Zork
Vast improvements
Minimal effort
Began implementing an AJAX interface
Can track location on web
Became less about Asterisk
More about my application
Limit is my imagination
Play now!

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