Building a Scalable Hosted Call Center Platform

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Project Requirements

- Scalable architecture for inbound, outbound and blended call centers
- Redundant and fail-over components
- Target call centers with 5 or more agents
- Dedicated telephony hardware per client
- Pluggable hardware and software add-ons
- High-density server co-location installation
- Multiple-carrier telco termination
- Pre-paid telco time billing
Scalable/Redundant Architecture

- RAID-1 or RAID-10 everywhere (except archive [RAID-6])
- Telco termination services
  - Multiple carriers, use of OpenSIPS with backup
- Database services
  - MySQL, Master/slave replication
- Web services
  - Apache load balancing
- ViciDial Call Center
  - Multi-server, load-balanced
- Icinga monitoring software
Call Path Diagram:
Dedicated Telephony Hardware

- A problem with many hosted multi-tenant call center services is control of resource allocation.
- Poor audio quality and reduced total capacity of hardware if you use Virtual Machines.
- Use of Sangoma VoiceTime USB module hardware timer for better audio quality at high load.
- On-server audio recording.
- 5-50+ agents per server (depending on type of call handling).
- Add more servers to scale a client to hundreds of seats in their own cluster.
Small 1U Telephony Servers

- Single quad-core Intel CPU with 4GB RAM
- Software RAID-1 for redundancy of drives
- 1U form factor, 10 inches deep
- All ports in front except for power plug
- We add extra fans for better ventilation
- Very low power usage
Hardware Add-ons

- Sangoma VoiceTime USB module
  - For hardware timer to give better audio quality at higher loads

- Sangoma D100 Transcoding cards
  - For clients or carriers wanting G729 codec use
  - Includes licenses
  - Multiple capacities
Software Add-ons

- Cepstral Text-to-Speech
  - Broadcast outbound campaigns
- Sangoma Call Progress Analysis
  - Very fast, high-accuracy Pre-Answer and Answering Machine Detection
- QueueMetrics Statistical Analysis
  - More visually appealing call stats package
- Zoiper webphone
  - No-agent-configuration, high-quality softphone that can be embedded in the ViciDial screen
Agent Screen with Embedded Phone

Hello and thank you for calling ACME Widgets, My name is Admin, can I schedule an appointment for you to review our lovely widgets?

Appointment Date: 2010-08-09
Appointment Time: 12:44
Favorite Color:
- Red
- Blue
- Green
- Purple

Discussion Topics:
- Price
- Color
- Texture
- Shipping

Contact ID: 7275551113
Nearest City: Chicago

Account: Your Phone
High-Density Co-Location

- Tier 3 Co-location facility in Tampa, FL, USA
- 3 cabinets
- Double-racked small 1U servers allows for 74+ servers per rack
High-Density Server Installation

- Similar to how many large data centers like Google are set up on a per-rack basis
- Center hot-air-column exhausting out the top
Multiple Carrier Telco Termination

- Several outbound carriers are used for placing outbound calls
  (some carriers do not like heavy or rapid outbound dialing)
- Calls can fail then retry another carrier depending on the return code
- For inbound there are not too many options for multi-carrier. Some clients have inbound numbers on more than one carrier, or use providers that distribute calls to multiple inbound numbers
- OpenSIPS is used for all telco termination routing to and from the ViciDial servers
Pre-Paid Telco Time Billing

- All customers inbound and outbound calls can be selectively allowed or denied traffic
- Logging of call time is done at the OpenSIPS layer for the best accuracy
- Clients have an account on our hosting web portal that allows them to check their balance, add to their balance and download CDRs
- Inbound, outbound and international can all be billed at different rates
Thank you!

For more information, go to:

http://www.vicidial.org