

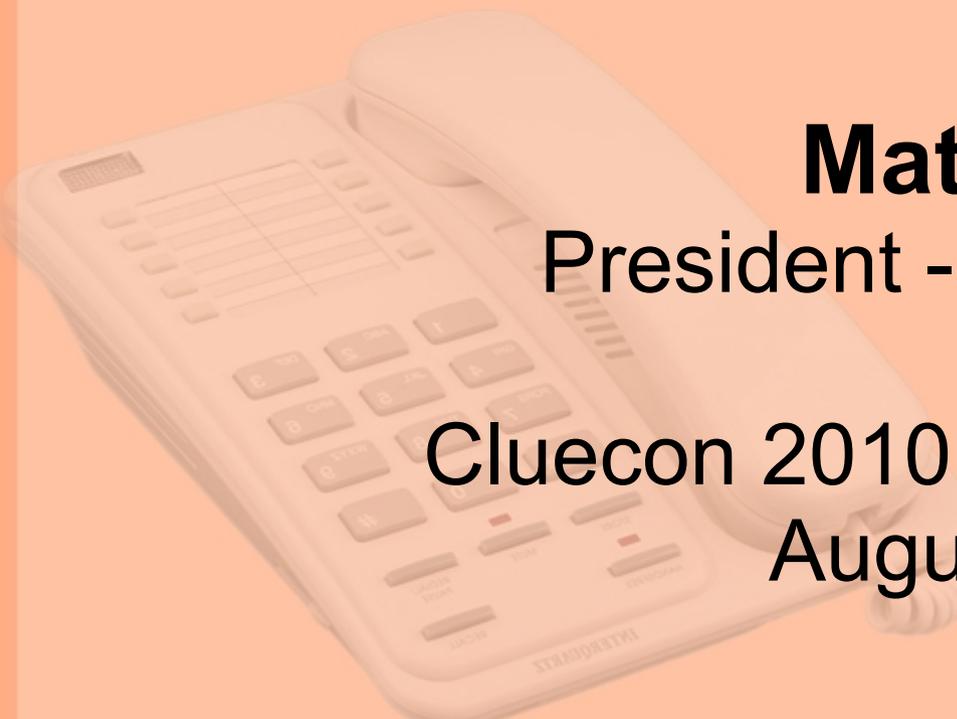
Building a Scalable Hosted Call Center Platform

Presented by

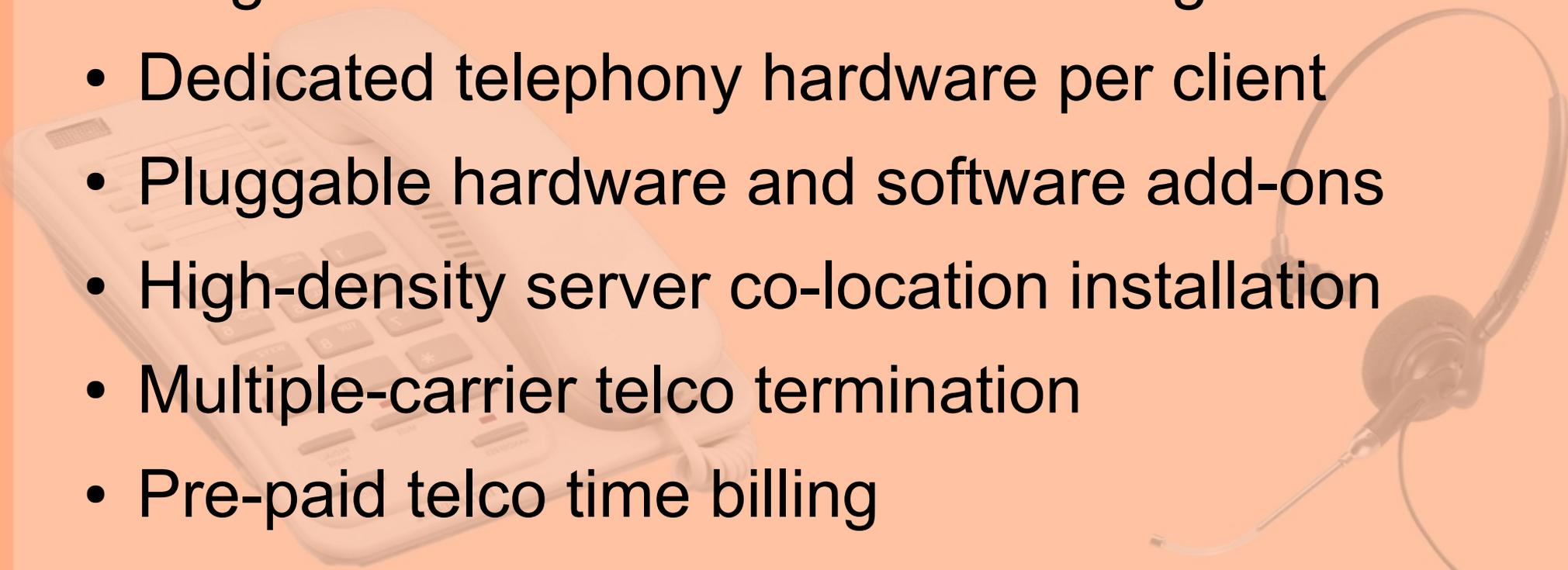
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Cluecon 2010 * Chicago, IL, USA
August 4, 2010

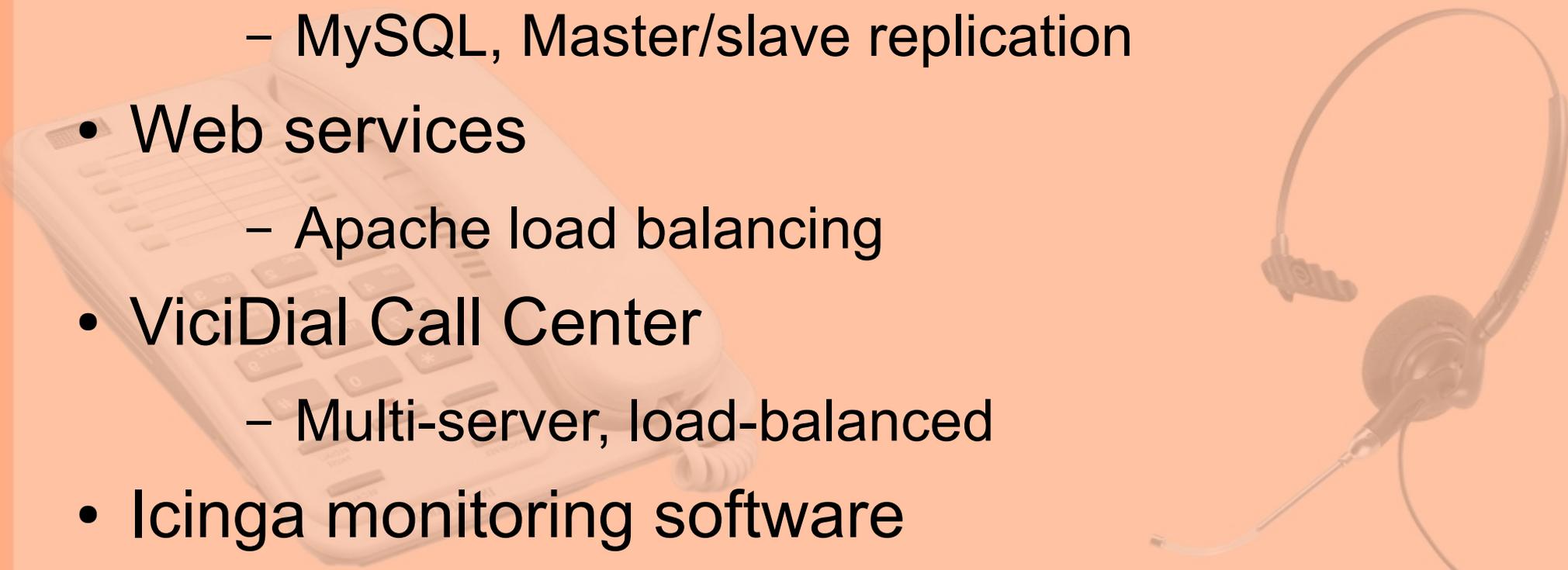


Project Requirements

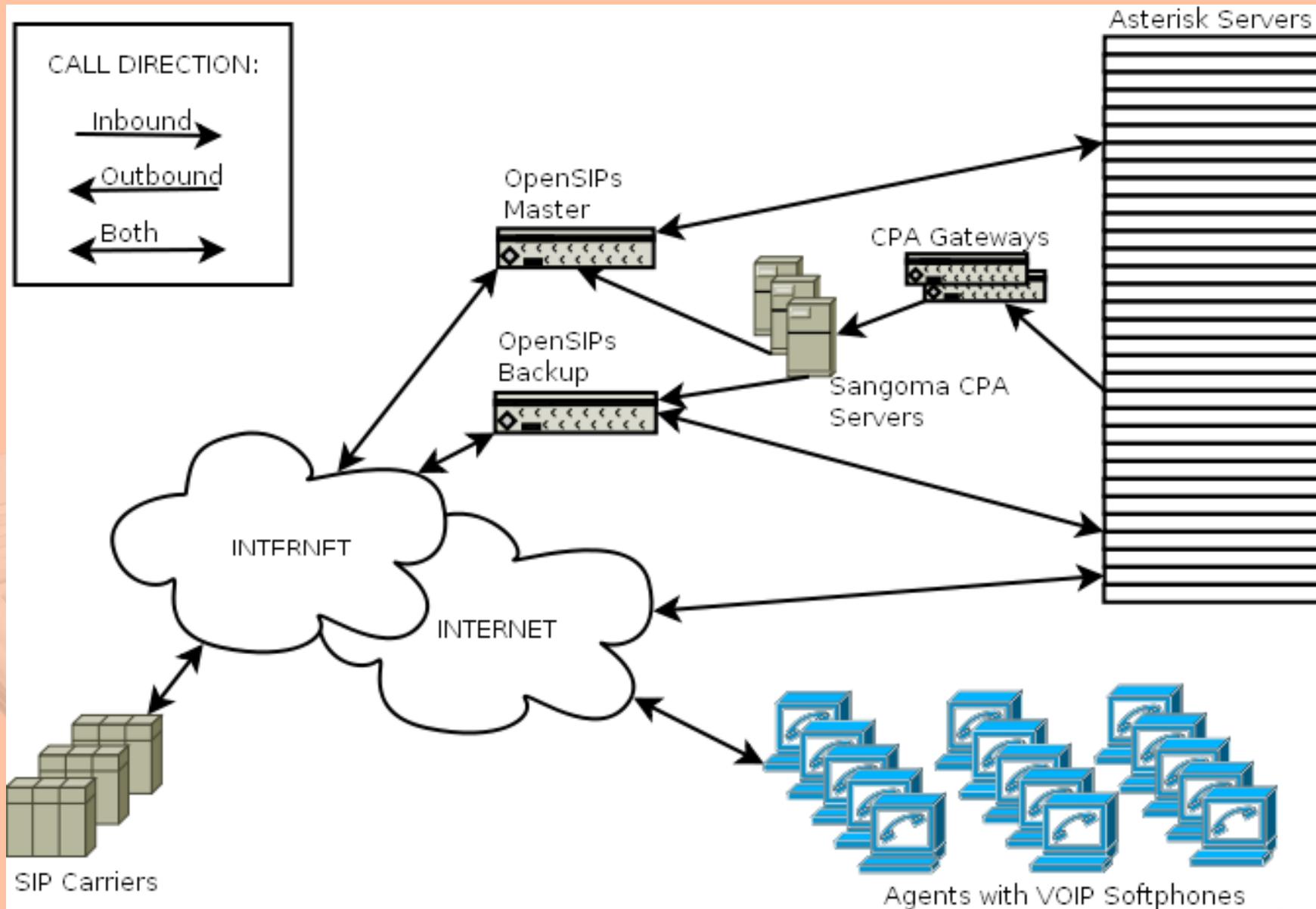
- Scalable architecture for inbound, outbound and blended call centers
 - Redundant and fail-over components
 - Target call centers with 5 or more agents
 - Dedicated telephony hardware per client
 - Pluggable hardware and software add-ons
 - High-density server co-location installation
 - Multiple-carrier telco termination
 - Pre-paid telco time billing
- 
- A faint, semi-transparent background image showing a white office telephone on the left and a headset with a microphone on the right, set against a light orange gradient.

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



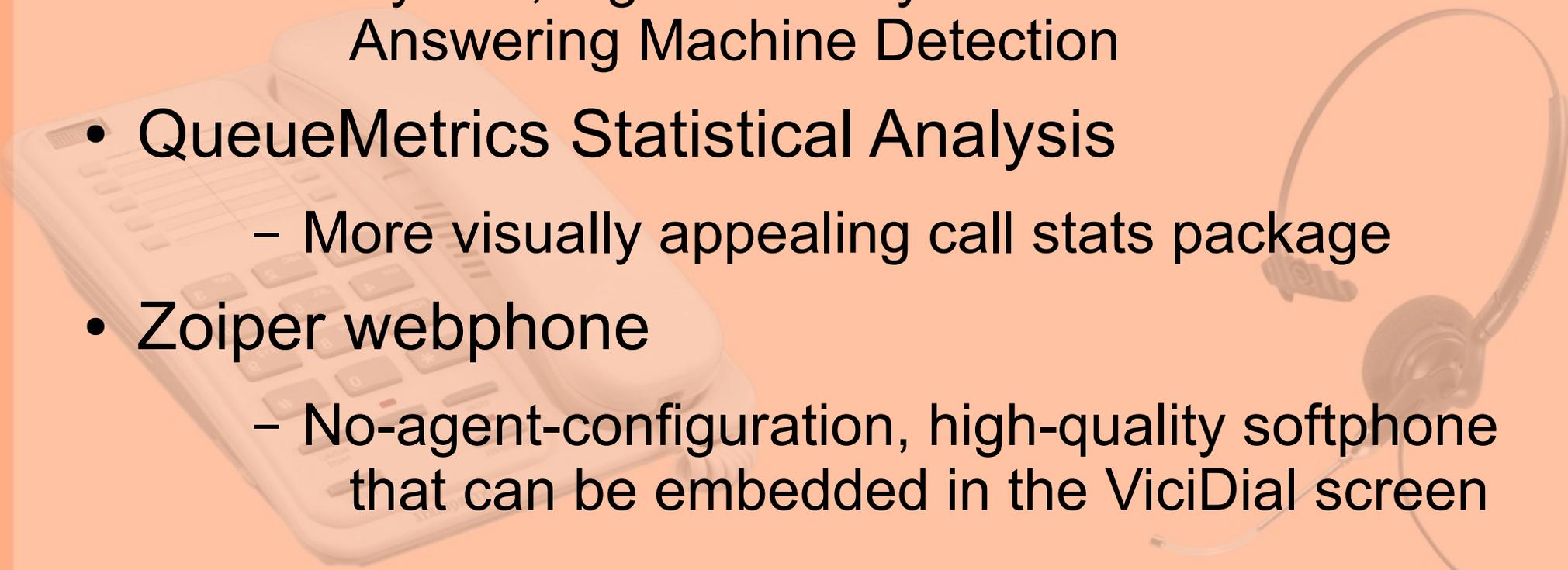
- Sangoma D100 Transcoding cards

- 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

Logged in as User : 6666 on Phone: IAX2/cc330 to campaign: TESTCAMP GROUPS LOGOUT [WebPhone View -](#)

VICIdial **SCRIPT** **FORM** 2010-08-02 11:45:13 session ID: 8600051 **Calls in Queue: 1** **LIVE CALL**

STATUS: Incoming: 727-555-1212 Group- TEST inbound 3 Fronter: - 7275551113 seconds: 21 [refresh](#)

PAUSE **RESUME**

ALT PHONE DIAL

RECORDING FILE:
20100802-114450_727555...

RECORD ID: 1839

STOP RECORDING

WEB FORM

WEB FORM 2

PARK CALL

TRANSFER - CONF

QUICK TRANSFER

RE-QUEUE CALL

HANGUP CUSTOMER

SEND DTMF

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 [help+](#) Appointment Time [help+](#)

Favorite Color
 Red
 Blue
 Green
 Purple
[help+](#)

Appointment Notes
 [help+](#)

Discussion Topics
 Price
 Color
 Texture
 Shipping
[help+](#)

Contact ID [help+](#)

Nearest City [help+](#)

ZOIPER

Phone to dial

Account

Agent web-client version: 2.4-281 BUILD: 100726-1233 Server: 192.168.198.5 [Hide Calls In Queue](#) **HOT KEYS INACTIVE** **MUTE** [Agents View +](#)

Calls In Queue:

	PHONE	NAME	WAIT	AGENT	CALL GROUP	TYPE
TAKE CALL	7275551212	Testing	0:18	7275551113 -	TEST_IN3 - TEST inbound 3	IN

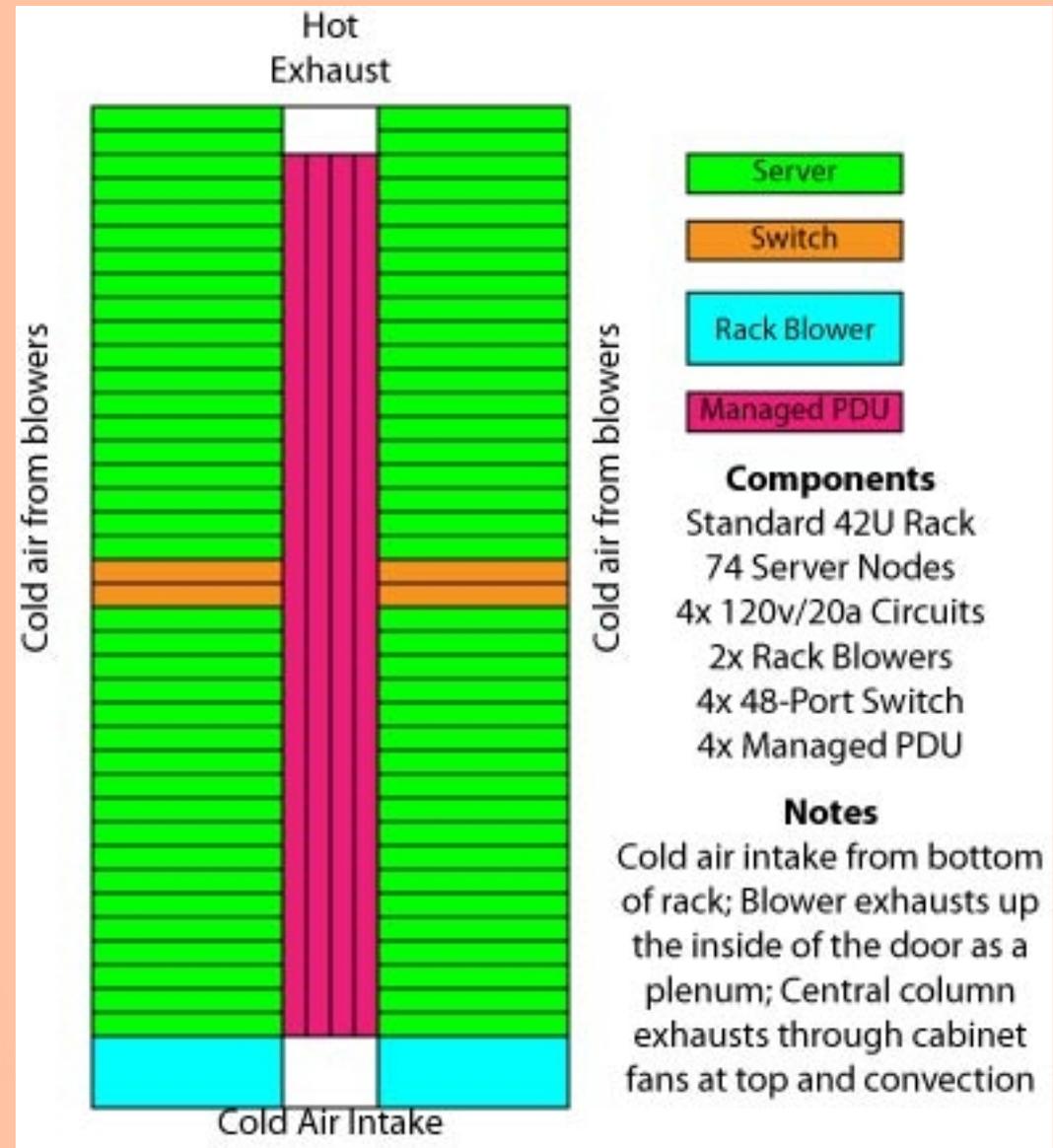
High-Density Co-Location

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

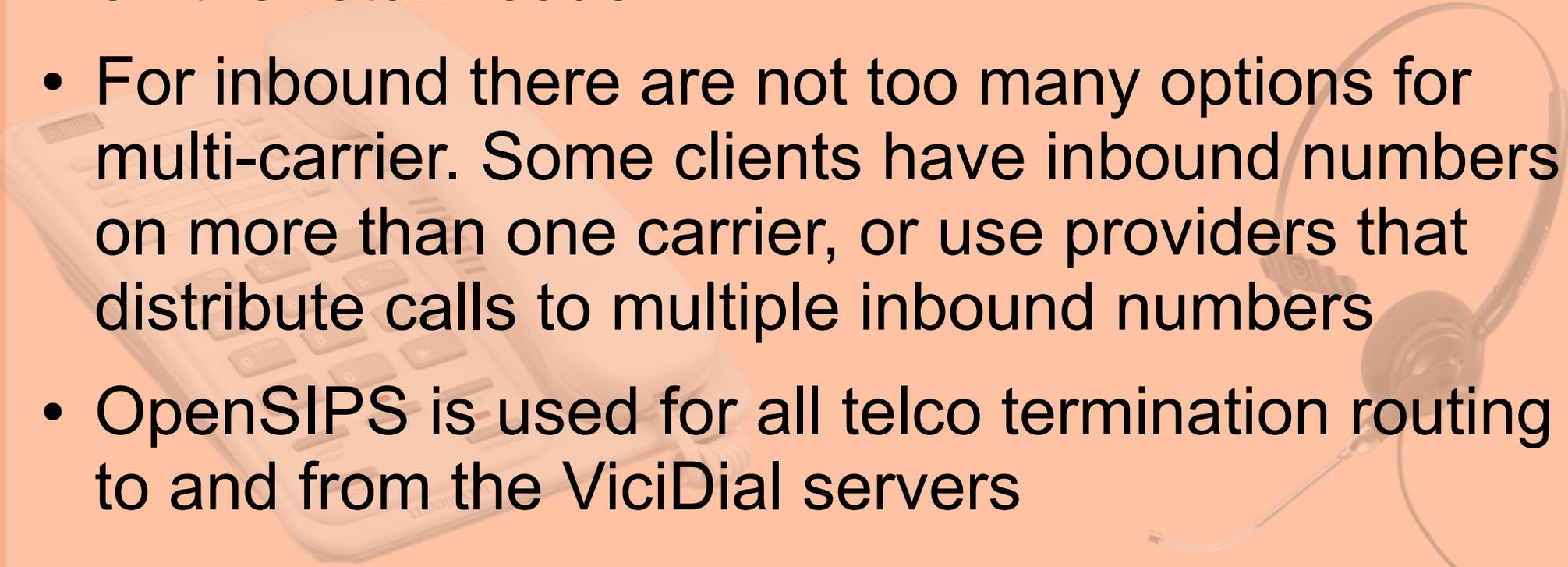


High-Density Server Installation

- 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

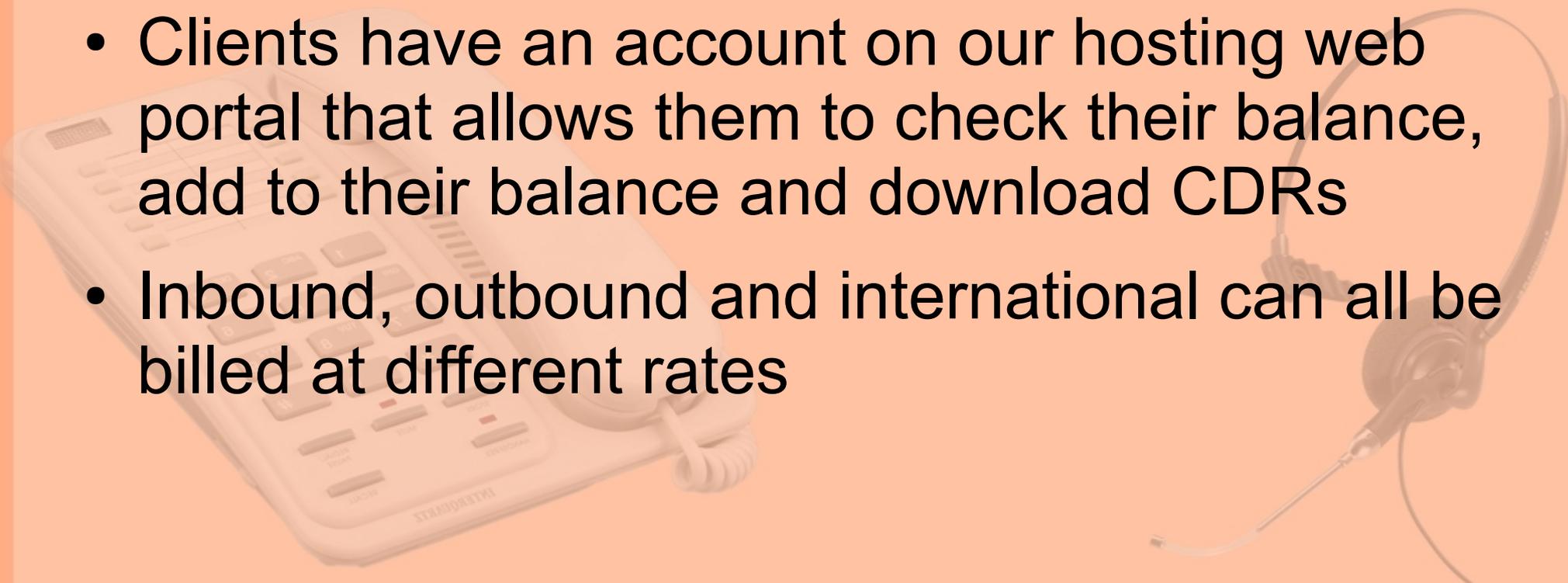


Multiple Carrier Telco Termination

- 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
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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>

