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Asterisk World

Multi-Site Open Source Call Center Deployment:
A European Case Study

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Multi-Site Open Source Call Center Deployment: A European Case Study

By

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President, eflo.net LLC

The Customer

- Comdata S.P.A. - an Italian business process outsourcing company that offers call center services
- Uniplay – an Italian technology solutions company that is the direct customer contact, manages product customization and handles all on-site needs in Italy



COMDATA
WE CARE * WE SHARE



The Requirements

- Call center solution with:
 - Inbound and outbound call handling
 - CRM integration
 - Detailed reporting of calls
 - Detailed reporting of agent activities
 - IVR usage statistics
 - Connectivity between multiple locations
 - Closed network with no direct Internet access

The Network

- MPLS closed network runs between all Comdata locations providing a secure and closed company-wide network
- Outside limited access through restricted VPN connections to a small number of machines on internal network
- Telecom connectivity is provided by PRI E1 circuits connected through Digium cards on the Asterisk servers

The Locations

- Cernusco – 15 call center seats servicing one client(MPE), expanding the system to 150 seats capacity by April
- LaSpezia – 75 call center seats servicing two clients(ENI and Pfizer), 25 of those seats are remotely located in Rome

The Solution

- Asterisk open source PBX
- VICIDIAL open source call center suite
- SugarCRM open source CRM
- QueueMetrics statistical analysis
- MySQL relational database

Asterisk PBX

- Open Source PBX system features:
 - Virtually unlimited system capacity
 - Connectivity through PRI-E1, SIP and IAX
 - Easy connectivity of remote Asterisk systems
 - Ability to connect with legacy PBX systems
 - Built-in voicemail and phone conferencing
 - No per seat or other licensing costs
 - Never End-of-Life



VICIDIAL Call Center

- Open Source Call Center Suite features:
 - Inbound/Outbound/Blended call handling
 - Web-based agent and manager interfaces
 - Works across multiple servers
 - Detailed logging of calls and agents
 - No per-seat or other licensing costs
 - Integration with other systems like SugarCRM and QueueMetrics

VICdial

SugarCRM

- Customer relationship management system features:
 - Web-based user interface
 - Customizable data elements and reports
 - Ability to integrate with other systems



QueueMetrics

- Statistical Analysis package features:
 - Analysis of Asterisk queue logs
 - Analysis of VICIDIAL call and agent logs
 - Exporting of reports into several formats

QueueMetrics
call center monitor

MySQL Database

- Open Source Relational Database features:
 - Provides database back-end for:
 - VICIDIAL
 - SugarCRM
 - QueueMetrics
 - Allows for Master/Slave replication and failover



User Interface Screens

- Web-based agent and administrative screens
 - VICIDIAL agent screen
 - VICIDIAL administrator and report screen
 - SugarCRM
 - QueueMetrics

VICIDIAL Agent screen

Loggato come Utente: 1007 su Telefono: SIP/cc105 nella campagna: ENI_INB

[GROUPS](#) [LOGOUT](#)

VICIDIAL SCRIPT

2008-10-31 08:21:48

ID sessione: 8600052

Calls in Queue: 0

NO LIVE CALL

STATO: In entrata: (888)888-88 Group- ENI Fronter: 1029 - 1029

secondi: 413

PAUSE **RESUME**

Cust Time: Canale:

FILE REGISTRAZIONE:

Dati Cliente:

ID Registrazione:

Titolo: Nome: MI: Cognome:

START RECORDING

Indirizzo1:

WEB FORM

Indirizzo2: Indirizzo3:

PARK CALL

Citta': Stato: CAP:

TRANSFER - CONF

Provincia: Vendor ID: Sesso: U - Undefined

HANGUP CUSTOMER

Telefono: Prefisso: Num. Alternativo:

SEND DTMF

Mostra: Email:


Note:



Versione di VICIDIAL web-client: 2.0.5-179 BUILD: 81023-0411

Server: 10.0.52.95

[Mostra le informazioni relative al canale della conferenza](#)

MUTE 

VICIDIAL Administration

[English](#)  [Italiano](#) 

VICIDIAL ADMIN - [HOME](#) | [Timeclock](#) | [Logout](#)

Sunday February 1, 2009 3:27:27 AM

[Utenti](#) | [Campagne](#) | [Liste](#) | [Script](#) | [Filtri](#) | **[Gruppi Inbound](#)** | [Gruppi Utenti](#) | [Operatori Remoti](#) | [Admin](#) | [Report](#)

[Visualizza Gruppi Inbound](#) | [Aggiungi Gruppo Inbound](#) | [Copia Gruppo Inbound](#) | [Show DIDs](#) | [Add A New DID](#) | [Copy DID](#)

MODIFICAR UN REGISTRO DE LOS GRUPOS: ENI

ID Gruppo:	ENI 
Nome Gruppo:	ENI 
Colore Gruppo:	GREEN 
Attivo:	Y 
Web Form:	
Operatore Da Scegliere Per La Chiamata Successiva:	oldest_call_finish 
Queue Priority:	0 - Even 
Mostrar Fronter:	Y 
Script:	- 
Esegui all'avvio della telefonata:	NONE 
Transfiera -Conf DTMF 1:	
Transfiera -Conf El Número 1:	
Transfiera -Conf DTMF 2:	
Transfiera -Conf El Número 2:	
Secondi Abbattimento Telefonata:	3600 

VICIDIAL Report

Date Range:

2009-01-31 00:00:00 to 2009-02-01 23:59:59

Inbound Groups:

[MODIFY](#) | [REPORTS](#) | [CLOSER REPORT](#)


Shift:

VICIDIAL: IVR Stats: [ENI] 2009-02-01 03:25:31

Calls taken into this IVR: 1963
 Calls with no CallerID: 63
 Unique Callers: 1380

IVR	QUEUE	QUEUE	QUEUE	IVR	TOTAL	CALL PATH	
CALLS	CALLS	CALLS	PERCENT	TIME	TIME		
422	422	20	4.74%	62	415	START / Benvenuto / 1-Automobilista-o-motociclista / 1-Carta-Gold / 1-Gold-operatore / STOP	
382	0	0	0%	9	9	START / Benvenuto	
228	228	15	6.58%	66	414	START / Benvenuto / 1-Automobilista-o-motociclista / 2-Carta-Silver / 1-Silver-operatore / STOP	
193	0	0	0%	65	65	START / Benvenuto / 1-Automobilista-o-motociclista / 1-Carta-Gold / fuori-orario / STOP	
154	0	0	0%	68	68	START / Benvenuto / 1-Automobilista-o-motociclista / 2-Carta-Silver / fuori-orario / STOP	
123	0	0	0%	47	47	START / Benvenuto / 1-Automobilista-o-motociclista	
94	94	4	4.26%	82	377	START / Benvenuto / 1-Automobilista-o-motociclista / 3-Carta-Anonima-o-temporanea / 9-operatore / STOP	
58	58	0	0%	85	411	START / Benvenuto / 1-Automobilista-o-motociclista / 4-Cliente-senza-carta-fedelta-Agip / 9-operatore / STOP	
53	0	0	0%	84	84	START / Benvenuto / 1-Automobilista-o-motociclista / 3-Carta-Anonima-o-temporanea / fuori-orario / STOP	
46	0	0	0%	89	89	START / Benvenuto / 1-Automobilista-o-motociclista / 4-Cliente-senza-carta-fedelta-Agip / fuori-orario / STOP	
24	0	0	0%	63	63	START / Benvenuto / 2-Autotrasportatore / fuori-orario / STOP	
19	19	3	15.79%	76	452	START / Benvenuto / 2-Autotrasportatore / 9-Autotrasportatore-operatore / STOP	
17	17	2	11.76%	55	365	START / Benvenuto / 2-Autotrasportatore / 1-Carta-AgipMaxiGold-operatore / STOP	
15	15	4	26.67%	50	274	START / Benvenuto / 2-Autotrasportatore / 2-Carta-AgipMaxi-o-AgipMaxi-Silver-operatore / STOP	
13	0	0	0%	60	60	START / Benvenuto / 1-Automobilista-o-motociclista / 3-Carta-Anonima-o-temporanea	
9	0	0	0%	59	59	START / Benvenuto / 1-Automobilista-o-motociclista / 1-Carta-Gold	
8	0	0	0%	49	49	START / Benvenuto / 2-Autotrasportatore	
8	0	0	0%	62	62	START / Benvenuto / 1-Automobilista-o-motociclista / 2-Carta-Silver	
8	0	0	0%	57	57	START / Benvenuto / 1-Automobilista-o-motociclista / 1-Carta-Gold / 2-Soccorso-stradale-gold / STOP	
7	0	0	0%	83	83	START / Benvenuto / 1-Automobilista-o-motociclista / 4-Cliente-senza-carta-fedelta-Agip / 1-Per-sapere-come-iscriv	
5	5	0	0%	87	482	START / Benvenuto / 1-Automobilista-o-motociclista / 1-Carta-Gold / 1-Carta-Gold / 1-Gold-operatore / STOP	
4	0	0	0%	84	84	START / Benvenuto / 2-Autotrasportatore / 3-Per-informazioni-su-prodotti-servizi / 3-Per-avere-informazioni-sui-Mu	
4	0	0	0%	79	79	START / Benvenuto / 1-Automobilista-o-motociclista / 2-Carta-Silver / 3-Come-raggiungere-status-Silver / STOP	

SugarCRM



Welcome Will

My Account Training Employees Logout About

SUGAR SUITE

Search

Home Sales Marketing Support Activities Collaboration Tools Reports Other

Home Dashboard

Last Viewed: dddd Get More inform Setup Booth At Move Mountain

SHORTCUTS

- Create Contact
- Enter Business Card
- Create Account
- Create Lead
- Create Opportunity
- Create Quote
- Create Case
- Report Bug
- Schedule Meeting
- Schedule Call
- Create Task
- Compose Email

NEW CONTACT

First Name:

Last Name: *

Phone:

Email:

Add Dashlets ? Help

MY CALLS ↻ ↺ ✕

|<< Start | Previous (1 - 5 of 21) Next |>> End ||

Close	Subject	Duration	Start Date	Start Time	Accept?
<input checked="" type="checkbox"/>	Left a message	0h30m	2007-10-01	09:45	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	Get More information on the proposed deal	0h30m	2008-03-17	10:15	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	Discuss Review Process	0h30m	2007-09-24	10:30	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	Bad time, will call back	0h30m	2007-03-26	11:15	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	Discuss Review Process	0h30m	2008-03-04	09:00	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>


MY MEETINGS ↻ ↺ ✕

|<< Start | Previous (1 - 5 of 46) Next |>> End ||

Close	Subject	Duration	Start Date	Start Time	Accept?
<input type="checkbox"/>	Introduce all players	2h00m	2007-07-15	07:37	Accepted
<input checked="" type="checkbox"/>	Initial discussion	3h15m	2007-10-17	07:37	Accepted <input type="checkbox"/> <input type="checkbox"/>

MY PIPELINE Refresh Chart ✕

Pipeline total is \$705.00K



Rollover a bar for details.

Date range is 2007-05-08 to 2010-01-01
Opportunity size in \$1K

Shows cumulative amounts by selected sales stages for our opportunities where the expected closed date is within the specified date range.

Last run on 2007-05-08 12:58

MY LEADS ↻ ↺ ✕

|<< Start | Previous (1 - 5 of 108) Next |>> End ||

Name	Office Phone	Date Created
Jamey Dalton	(171) 540-0748	2007-03-21

QueueMetrics



Home Prese **Perse** Prefisso Squilli Distrib. Agenti Risultati Tutto

Dettagli report:

Code semplici considerate: MPE_CUSTOMER|MPE_LIDL|MPE_PROSPECT
MPE_CUSTOMER, MPE_LIDL,
MPE_PROSPECT

Data iniziale: 23 ottobre 2008, 0:00

Data finale: 23 ottobre 2008, 23:59

Totale chiamate: 330
97,3% prese / 2,7% perse

Chiamate perse

Tutte le chiamate:

Numero chiamate perse:	9
Attesa media prima di appendere:	68,6 s.
Attesa minima:	0:01
Attesa massima:	2:32
Attesa totale:	0,2 H
Posizione media all'ingresso	1,0
Min posizione all'ingresso	1
Max posizione all'ingresso	1
Copertura	100,0%
Posizione in coda media allo sgancio:	1,0
Posizione minima:	1
Posizione massima:	1

Chiamate nell'intervallo:

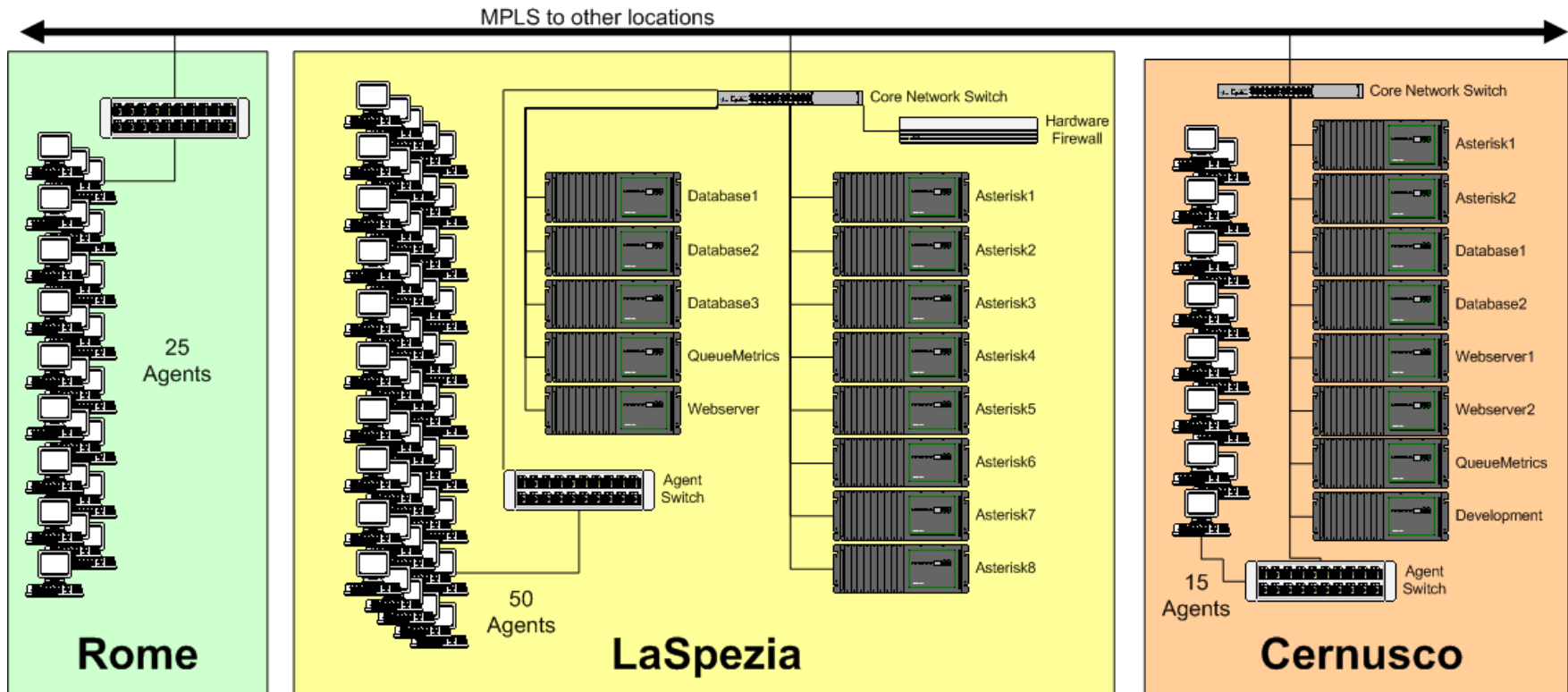
Numero chiamate perse:	9
Attesa media prima di appendere:	68,6 s.
Attesa minima:	0:01
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Attesa totale:	0,2 H
Posizione media all'ingresso	1,0
Min posizione all'ingresso	1
Max posizione all'ingresso	1
Copertura	100,0%
Posizione in coda media allo sgancio:	1,0
Posizione minima:	1
Posizione massima:	1

Cause di sconessione

Causa	N. Chiamate	...
Abbandono del chiamante	9	100,0%

Network Diagram

Comdata Multiple-Location Call Center



The Challenges

- No Internet access from servers
 - NTP time synchronization issues
 - Downloading of software updates
- Inconsistent CallerID delivery in Italy
- Logging differences between VICIDIAL and QueueMetrics
- MySQL tuning
- Digium T1/E1 card jumpers
- Time and Language difference

The Future

- Adding 150 seats of capacity out of the Cernusco location
- A new installation at Padova
- Adding new features to existing installations

For More Information:

- Comdata S.P.A - <http://www.comdata.it>
- Uniplay - <http://www.uniplay.it>
- Asterisk - <http://www.asterisk.org>
- VICIDIAL - <http://www.vicidial.org>
- SugarCRM - <http://www.sugarcrm.com>
- QueueMetrics - <http://www.queuemetrics.com>
- MySQL - <http://www.mysql.com>
- eflo.net LLC - <http://www.eflo.net>