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

By Matt Florell – President, eflo.net LLC

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

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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
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
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
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
MODIFICAR UN REGISTRO DE LOS GRUPOS: ENI

<table>
<thead>
<tr>
<th>ID Gruppo: ENI</th>
<th>Nome Gruppo: ENI</th>
<th>Colore Gruppo: GREEN</th>
<th>Attivo: Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Form:</td>
<td>Operatore Da Scegliere Per La Chiamata Successiva: oldest_call_finish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Queue Priority: 0 - Even</td>
<td>Mostrar Fronter: Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Script: -</td>
<td>Esegui all’avvio della telefonata: NONE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfiera -Conf DTMF 1:</td>
<td>Transfiera -Conf El Número 1:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfiera -Conf DTMF 2:</td>
<td>Transfiera -Conf El Número 2:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondi Abbattimento Telefonata: 3600</td>
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</table>
### VICIDIAL Report

**Date Range:**
- From: 2009-01-31 00:00:00 to 2009-02-01 23:59:59

**Inbound Groups:**
- NONE
- AGENTDIRECT
- ENI
- l'amaca
grossisti

**Calls taken into this IVR:** 1980

<table>
<thead>
<tr>
<th>IVR</th>
<th>QUEUE</th>
<th>DROP</th>
<th>DROP</th>
<th>AVG</th>
<th>AVG</th>
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<tbody>
<tr>
<td>CALLS</td>
<td>CALLS</td>
<td>CALLS</td>
<td>PERCENT</td>
<td>TIME</td>
<td>TIME</td>
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<tr>
<td>452</td>
<td>422</td>
<td>10</td>
<td>4.74%</td>
<td>65</td>
<td>11</td>
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<tr>
<td>302</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>3</td>
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<tr>
<td>302</td>
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<td>0%</td>
<td>18</td>
<td>18</td>
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<tr>
<td>193</td>
<td>15</td>
<td>13</td>
<td>5.04%</td>
<td>66</td>
<td>14</td>
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<tr>
<td>132</td>
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<tr>
<td>127</td>
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<tr>
<td>94</td>
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<td>4</td>
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<td>82</td>
<td>77</td>
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<tr>
<td>55</td>
<td>58</td>
<td>0</td>
<td>0%</td>
<td>80</td>
<td>76</td>
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<tr>
<td>55</td>
<td>58</td>
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<td>80</td>
<td>76</td>
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<td>0%</td>
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<td>15</td>
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<td>0%</td>
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<td>9</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>60</td>
<td>60</td>
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<tr>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>49</td>
<td>49</td>
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<tr>
<td>8</td>
<td>0</td>
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<td>0%</td>
<td>65</td>
<td>65</td>
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<td>8</td>
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<td>57</td>
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<td>0</td>
<td>0%</td>
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<td>82</td>
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<td>5</td>
<td>5</td>
<td>0</td>
<td>0%</td>
<td>87</td>
<td>82</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>84</td>
<td>84</td>
</tr>
</tbody>
</table>

**Unknown Callers:** 1980

**IVR States:** [EN]
QueueMetrics

Chiamate perse

<table>
<thead>
<tr>
<th>Tutte le chiamate:</th>
<th></th>
<th>Chiamate nell’intervallo:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numero chiamate perse:</td>
<td>9</td>
<td>Numero chiamate perse:</td>
</tr>
<tr>
<td>Attesa media prima di appendere:</td>
<td>88,6 s.</td>
<td>Attesa media prima di appendere:</td>
</tr>
<tr>
<td>Attesa minima:</td>
<td>0,8 s.</td>
<td>Attesa minima:</td>
</tr>
<tr>
<td>Attesa massima:</td>
<td>2,32 s.</td>
<td>Attesa massima:</td>
</tr>
<tr>
<td>Attesa totale:</td>
<td>0,2 H</td>
<td>Attesa totale:</td>
</tr>
<tr>
<td>Posizione media all’ingresso</td>
<td>1,0</td>
<td>Posizione media all’ingresso</td>
</tr>
<tr>
<td>Min posizione all’ingresso</td>
<td>1</td>
<td>Min posizione all’ingresso</td>
</tr>
<tr>
<td>Max posizione all’ingresso</td>
<td>1</td>
<td>Max posizione all’ingresso</td>
</tr>
<tr>
<td>Copertura</td>
<td>100,0 %</td>
<td>Copertura</td>
</tr>
<tr>
<td>Posizione in codice medio alla segnancio:</td>
<td>1,0</td>
<td>Posizione in codice medio alla segnancio:</td>
</tr>
<tr>
<td>Posizione minima:</td>
<td>1</td>
<td>Posizione minima:</td>
</tr>
<tr>
<td>Posizione massima:</td>
<td>1</td>
<td>Posizione massima:</td>
</tr>
</tbody>
</table>

Cause di sconnessione

<table>
<thead>
<tr>
<th>Causa</th>
<th>N. Chiamate</th>
<th>Posizione</th>
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</thead>
<tbody>
<tr>
<td>Abbandono del chiamante</td>
<td>9</td>
<td>100,0 %</td>
</tr>
</tbody>
</table>
Network Diagram

Comdata Multiple-Location Call Center

Rome

LaSpezia

Cernusco

25 Agents

50 Agents

15 Agents

MPLS to other locations
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