Zabbix Monitoring Critical Services in Brazil

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Agenda

- SERPRO - Scope
- The role Zabbix plays
- Remote monitoring with end-user view
- Customizations we developed
- Opportunity for improvements
SERPRO manages data services related to passports, federal taxes, government websites, Federal Revenue and National Treasury are published and maintained by SERPRO;

By law, all information and communications technology (ICT) services which are considered strategic for the Brazilian Federal Government must be managed by SERPRO, or directly managed by federal institutions;

Hence, there is the need for creating Points of Presence (POPs) in all Brazilian capitals and largest cities;
● Present throughout Brazil;

● It has multiple operators and technologies;

● It has a wide and heterogeneous portfolio of technologies and different SLAs (service levels);
• It is based on nodes;
• Massive use of proxies (both traditional and specialized ways);
• Integration with third-party tools;
• Integration with other monitoring tools;
• Integration with reporting tools (currently undergoing tests);
Implemented Architecture - Zabbix

- Master Node: 1;
- First Level Nodes: 12;
- Second level nodes: 6;
- Internal Proxies: 20;
- External Proxies: +30;
- + 2,000 network elements (for WAN);
- + 10,000 servers;
Why perform external monitoring?

- The experience of the users with our services varies, depending on factors beyond our control;
- The quality of ISPs oscillates;
- Several live critical services under the scrutiny of the media (TV, Internet, newspapers);
Sometimes we receive reports by external companies criticizing our services’ availability;

- Generally these reports are based on limited testing sources under the same ISP;
- These reports are rarely based on multiple ISPs;
- These reports are almost never based on normal end-user connections / links;

If we compare to dalmatian dog...
The report would be like this...
How SERPRO performs the analysis

- It is necessary to have a minimum valid sampling. We have 27 states and a test made from one or two states is not representative enough;
- We have thousands of ISPs and different qualities of services. This should be taken into account;
- Providers can also experience access problems;
- 100% quality is never cheap!

SERPRO understands that a dalmatian dog is like this... Therefore, a monitoring report must be comprehensive!
External Monitoring

- Zabbix proxies with custom scripts using low-cost hardware (Raspberry PI) to simulate accesses;
- Dynamic IP’s, residential links,
- Links are not acquired by SERPRO;
- Home working based monitoring;
- DSL Connections, 3g, 4g;
Tools using Zabbix data

- Portals that certifies contracts (Graphics, SLA);
- Specialized tools for generation of business data for specific solutions;
Plugins created

- Services tree
  - Created in 2009;
  - First version in Java;
  - Updated to HTML5 in 2013;
- Zabbix-Extras
  - Some years ago...;
  - Utilizes API and SQL;
● Utilizes Zabbix IT services;
● Adds a BSC style dashboard in order to improve the infrastructure and service through better root cause analysis;
● Enables friendly graphical display for the identification of the service;
First we have low charge of users...
Install two servers and all is fine...

Computational power need: 6 users
Computational power handle: 20 users

Configuration:
2 GB RAM
4 Processors

Server A or server B can support 10 users
The number of users increase much sooner than expected... The system is slow....

We need a new server...

Computacional power need: **27 users**
Infrastructure can handle: **20 users**
The new server is very more powerful and can support the users.

But contract says about redundancy...

User requirement: **27 users**
Infrastructure can handle: **60 users**

New Server Configuration:
- **32gb ram**
- **16 processors**

Server C or server B can support **40 users**

Server A or server B can support **10 users**

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**ZABBIX**
Server A or Server B is down, we can support the users and still having redundancy;

- Is a incident and need to be solved... But... The user is not impacted in this moment;

- In this case the Service tree not will propagate the "DISASTER" problem. The problem only will appear on same level.

User requirement: **27 users**
Infrastructure can handle: **50 users**
Server A AND Server B is down, we can support the users but we don't have redundancy;

- The user is not impacted in this moment... But the contract have a impact so need to solve now;
- In this case the Service tree will propagate the "DISASTER" with the disaster level to prevent a real problem.

User requirement: **27 users**
Infrastructure can handle: **40 users**
Editing a element
• Adds new features;
  • Reports
    – Not supported items;
    – Storage cost (using zabbix formula);
  • Capacity and Trend;
  • Events correlation
    – Throughout the monitored environment according to business rules (try to show relation between triggers);
### Zabbix-Extras – Capacity and Trend

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<thead>
<tr>
<th>Momento</th>
<th>Valor</th>
<th>Tipo</th>
</tr>
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<tbody>
<tr>
<td>26 - 01/07/12</td>
<td>72.69 %</td>
<td>Valor coletado na monitoração</td>
</tr>
<tr>
<td>27 - 08/07/12</td>
<td>60.63 %</td>
<td>Valor coletado na monitoração</td>
</tr>
<tr>
<td>31 - 03/08/12</td>
<td>37.85 %</td>
<td>Valor coletado na monitoração</td>
</tr>
<tr>
<td>32 - 12/08/12</td>
<td>36.87 %</td>
<td>Valor coletado na monitoração</td>
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<tr>
<td>33 (13/08/2012)</td>
<td>27.92 %</td>
<td>Tendência</td>
</tr>
<tr>
<td>34 (20/08/2012)</td>
<td>18.97 %</td>
<td>Tendência</td>
</tr>
<tr>
<td>35 (27/08/2012)</td>
<td>10.01 %</td>
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<tr>
<td>36 (03/09/2012)</td>
<td>1.06 %</td>
<td>Tendência</td>
</tr>
<tr>
<td>37 (10/09/2012)</td>
<td>-7.9 %</td>
<td>Tendência</td>
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<tr>
<td>38 (17/09/2012)</td>
<td>-16.85 %</td>
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</tr>
<tr>
<td>39 (24/09/2012)</td>
<td>-25.81 %</td>
<td>Tendência</td>
</tr>
</tbody>
</table>

**centos_zabbix_node - Free disk space on / (percentage)**

![Graph showing trend analysis](image_url)
Paldies!
Obrigado! :-) 
Adail Spínola Horst

http://spinola.net.br/blog
http://www.facebook.com/groups/zabbixbrasil/