# Zabbix Monitoring Critical Services in Brazil



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The Ultimate Open Source Monitoring Solution

Zabbix Conference 2013



- SERPRO Scope
- The role Zabbix plays
- Remote monitoring with end-user view
- Customizations we developed
- Oportunity 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 tecnology (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;



# SERPRO Wide Area Network (WAN)

• Present throughout Brazil;

 It has multiple operators and technologies;

 It has a wide and heterogeneous portfolio of technologies and different SLAs (service levels);





### **Monitoring Architecture – Zabbix**

- . 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);





# Analysis made by other companies

- 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 ot 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 experiences 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;
- Uptaded 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...





Computacional power need: **6 users** Computacional power handle: **20 users** 



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



- The number of users increase much sooner than expected... The system is slow....
- We need a new server...





- The new server is very more powerful and can support the users.
- But contract says about redundancy...





- Server A or Server B is down, we can support the users and still havving 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 apear on same level.



- 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.



#### Service Tree - Expresso

ÁRVORE DE SERVIÇOS DE TI Utima atualização em 2013-86-30 16-40 85.

Atualização 1 min \* Serviço Expresso \* Etetuar login



1641 nós 1626 2 1 0 3 9 0 recoher tudo





### **Editing a element**

ZABBIX



SERPRO



- . 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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Momento	Valor	Tipo		
26 - 01/07/12	72.69 %	Valor coletado na monitora		
27 - 08/07/12	60.63 %	Valor coletado na monitora		
31 - 05/08/12	37.85 %	Valor coletado na monitora		
32 - 12/08/12	36.87 %	Valor coletado na monitora		
33 (13/08/2012)	27.92 %	Tendência		
34 (20/08/2012)	18.97 %	Tendência		
35 (27/08/2012)	10.01 %	Tendência	100	-
36 (03/09/2012)	1.06 %	Tendência	80	-
37 (10/09/2012)	-7.9 %	Tendência	8	
38 (17/09/2012)	-16.85 %	Tendência	10	
39 (24/09/2012)	-25.81 %	Tendência	20	

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# Paldies! Obrigado! :-) Adail Spínola Horst



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



