class openfuture
$consultants = ['you?', 'johan', 'bert', 'patrik'],
$sales = ['ann'],
$services = ['infrastructure', 'consultancy'],
$trainings = ['zabbix', 'bacula', 'puppet'],
$partners

Zabbix @ LNE
Vlaamse Milieuoverheid
Flemish environmental government
Departement Omgeving

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Who Am I

- Name: Patrik Uytterhoeven
- Job: Open-source consultant
- Company: Open-future
- Zabbix 4.0 Certified Trainer
- Interests: Zabbix, Ansible, PostgreSQL, SeLinux, ...
The Project

- Migration from a vlan per application to a flat network.
- Moving a way from VmWare to OpenNebula
- Automate everything as much as possible.
- Integrate Zabbix in this new setup and solve current problems with Zabbix.
Zabbix issues with current setup

- Zabbix server Crashes
- Zabbix UI is slow
- Missing data in graphs
- Many false positives
- Unsupported items
- Too many emails
- Difficult to maintain
Setup of original Zabbix Server

- Zabbix 3.0 server Proliant G5
  - Cpu: 4
  - Memory: 32GB

- DB Server Sun Fire X4200
  - PostgreSQL 9.3
  - Memory: 4GB
  - Cpu: 4
  - DB Size 32GB

- 300 VPS, 1000 hosts, 135000 items, 36000 triggers, 700 JMX hosts.
The Real Problem

- Slow disks on the DB server
  - Housekeeper busy 100% ...
  - Not enough memory on DB Server
- No use of macros in templates instead:
  - Templates for testing, development and production.
  - Templates for different servers
  - Lokal items
- Passive monitoring instead of active (network related)
- Full access for devs (no control over quality)
- Bad tuning of Zabbix internal items.
- Different network setup for the new environment.
How did we solve it?

- New Zabbix server for the new environment so we could move applications to the new platform and keep monitoring both platforms without making Zabbix multi-homed.

- New Server would also solve DB I/O issues
  - Dell PowerEdge R430
    - CPU: 4 cores
    - OS Disk: 2 SAS Raid 1
    - DB Disk: 4 SSD Raid 10 BBC
    - PostgreSQL 10
  - Still growing but at the moment we have:
    - +- 2000 Hosts, 210,000 Items, 81,600 Triggers, 1400 VPS
How did we solve it?

- New platform to deploy on Open Nebula
  - Custom build tool (oho) to deploy on Open Nebula
    - Uses bash and Ansible to deploy servers
    - Ansible used to register new servers in Zabbix
    - Ansible used to place servers in maintenance mode in Zabbix.
  - Command line tool to deploy and web GUI
- We made new Smart templates for every application in Zabbix
  - No separation in templates between dev/testing/production. All differences are handled by macros.
Our databases

- Migration of +- 300 databases to our cloud infrastructure.
- Deployment/upgrades of databases is now automated with Ansible.
- Databases are automatic added to Barman for backup
- Zabbix agent is installed with PostgreSQL module
- Barman backups are monitored with LLD scripts
- More in depth monitoring of queries etc with pgBadger
How do we deploy Zabbix scripts?

- We only copy Zabbix Agent parameters to those agents who need it.
  - Done by Ansible, variables are pushed by our deployment tool.
  - Variables are set automatic based on name of the Template linked to our host.
  - Standard template names like
    - Template AGENT PostgreSQL ..
    - Template AGENT JAVA8 ...

```yaml
- name: "Redhat | Copy Barman Scripts to server"
  copy:
    src: userparameters-specific/userparameter_barman.conf
    dest: /etc/zabbix/zabbix_agentd.d/
    owner: zabbix
    group: zabbix
    mode: 0440
  when: zabbix_agent_barman == 'install'
  notify:
    - restart zabbix-agent
```

Zabbix @ LNE (slide 11/28)
How did we solve web monitoring?

- We made templates for Web monitoring with macros so that it was easier to monitor our websites.
- Endpoints to every website to monitor status Up or Down
  - Ex: http://someurl/healthcheck.jsp
Still not Good enough ...

- Still too much manual work ……
  - Adding macros to hosts took too much work
  - People forgot to ask to monitor websites.
  - Strings could change over time from UP to up or Up so not reliable.

- Our fix …. LLD based on endpoints in our application.
  - Applications are now built with the Springboot framework. Returning back status of Disk, Database, Web, … in JSON.
  - Our LLD script now creates the status for every health check in Zabbix.
How it looks like ...

```
"diskSpace": {
  "status": "UP",
  "total": 10340831232,
  "free": 7024721920,
  "threshold": 10485760
},
"refreshScope": {
  "status": "UP"
},
"hystrix": {
  "status": "UP"
}
```

Status output example of our application

---

<table>
<thead>
<tr>
<th>Endpoint App Health Status (6 Items)</th>
<th>Date/Time</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endpoint App Health Check for diskSpace</td>
<td>2017-07-15 13:40:49</td>
<td>Up (1)</td>
</tr>
<tr>
<td>Endpoint App Health Check for hystrix</td>
<td>2017-07-15 13:40:51</td>
<td>Up (1)</td>
</tr>
<tr>
<td>Endpoint App Health Check for localApplication</td>
<td>2017-07-15 13:40:57</td>
<td>Up (1)</td>
</tr>
<tr>
<td>Endpoint App Health Check for refreshScope</td>
<td>2017-07-15 13:41:02</td>
<td>Up (1)</td>
</tr>
<tr>
<td>Endpoint App Health Check for status</td>
<td>2017-07-15 13:41:02</td>
<td>Up (1)</td>
</tr>
</tbody>
</table>
The Problem

• Developers needs permissions on every new server this is time consuming.

• We also need to configure actions/conditions for messages.
How we solved it?

• Every development team has a name.
  – Example Team A, Team B, …

• Our deployment tool (oho) creates servers and places them in zabbix in a server group per Team and a group per per function.
  – Ex: place server in groups “Team A” and production

• We have a set of standard rules in Zabbix in our Actions that define that every user from “Team A” should get notifications from servers in Group “Team A”

• Usergroups from Team A will always have the permissions to see servers in Server “Group A"
The Problem

- Developers now are limited to only see their own Servers but sometimes knowing when LDAP is down or DNS can be useful.

- Users are now Zabbix users before admin or super admin. Creating graphs can sometimes be useful also graphs from production servers can be helpful.
How we solved it?

- We installed Grafana. Every developer has access to grafana and can query all resources from zabbix and some other applications and build nice graphs.
Maintenance Issues

- Near 200 daily (re)deployments of servers. This generates many maintenance rules in zabbix as every deployment will create a new maintenance rule.
How we solved it?

We run daily from cron a script that does a cleanup of all expired maintenance task older then x days.

It would be great if this option was available in Zabbix to cleanup all the expired task after x number of days. ZBXNEXT-4007
Sometimes things still go wrong ...

- Network goes down ....
- DNS server goes down ...
- Airco ....
- Zabbix Proxy goes down ...

This has impact on our applications and Zabbix will go crazy ....
Spamming users with mass emails ...

Dependency on items alone is not enough to avoid this ...
How we solved this

No real solution yet ....

Maybe Zabbix 4.2 will solve this issue ... we are also in the progress of adding more and more tags :)

No solution in Zabbix at the moment to disable all actions and flush all emails in the queue.

- It would be useful to have an option that temporarily disables all actions and wipes the queue.
- Or some kind of built-in protection against spam from Zabbix.

Be careful with parallel processing of alerts !
JMX Monitoring

- About +-700 Hosts with Java applications on tomcat
- Sometimes garbage collectors would change
- Java or Tomcat version would change.

We solved it by building specific templates for each version and the use of macros for the different garbage collectors.
Still to much work ...

- Garbage collectors would change over time.
- Names would change of applications

So we decided to ask Zabbix to build LLD in JMX.
Network overview

Different tools were used for network monitoring because Zabbix is not so good in showing how traffic flow goes.
We solved this with weathermaps
Our nice looking Queue

### Queue of items to be updated

<table>
<thead>
<tr>
<th>Items</th>
<th>5 seconds</th>
<th>10 seconds</th>
<th>30 seconds</th>
<th>1 minute</th>
<th>5 minutes</th>
<th>More than 10 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zabbix agent</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Zabbix agent (active)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
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</tr>
<tr>
<td>Simple check</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>Zabbix aggregate</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Database monitor</td>
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<td>0</td>
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</tr>
<tr>
<td>IPMI agent</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>JMX agent</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Calculated</td>
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</tr>
</tbody>
</table>
Questions ?