Drive From ICMP Pings to Enterprise Security

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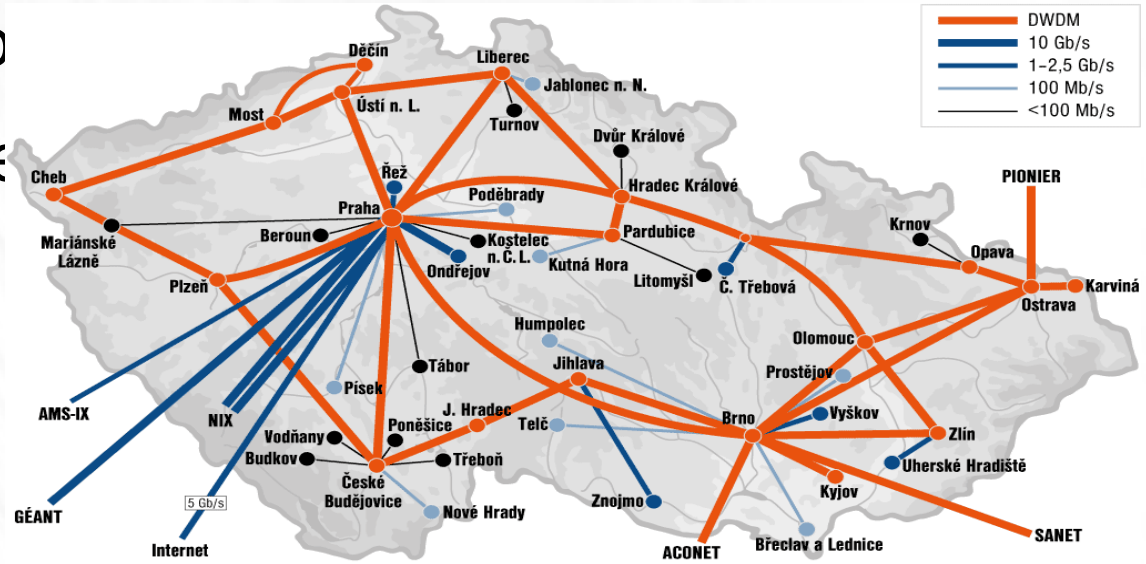
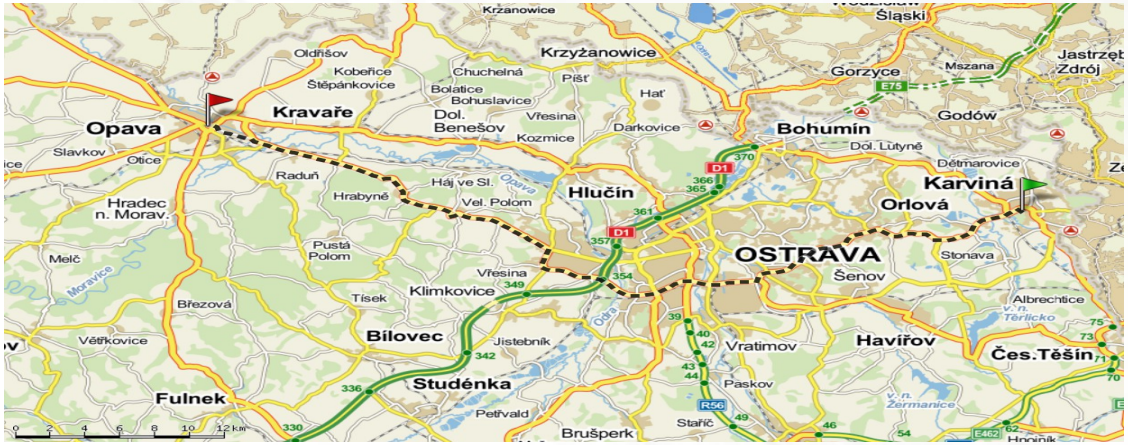


CESNET

- Czech academical network for research
- Includes all public Czech Universities



Silesian University in Opava

- Divided into Karvina and Opava
  - Faculty of Philosophy and Science in Opava
  - *School of Business Administration in Karvina*
  - Faculty of Public Policies in Opava
  - Institute of Mathematics in Opava

Zabbix on SLU today

- Karvina:
- Version 2.0.7
- Works very well
- Still on mysql. We still want to migrate to postgresql...
- Huge amount of config and inventory
- History and trends are copied to backup tables (+40G on disk)
- **752 active hosts, 37983 active items, 116 new values per second**
- Big inventory, connected with other systems like obnovang through API.
- Aproximately 12G of data.

Zabbix on SLU today

- Opava:
- Version 2.0.6
- Works very well
- Mysql
- **213 active hosts, 3435 active items, 140 new values per second**
- Aproximately 14G of data.

Embedding Zabbix agent

- **We absolutely need this**
- We use Zabbix agent in http://besip.cesnet.cz/
- We are in touch with OpenWrt community
- We sent patches for OpenWrt to upgrade Zabbix to latest version
- zabbix_agentd and zabbix_sender are working perfectly

Embedding server?

- **Do we need to embed zabbix server? (discussion...)**
  - We say yes...
- **Problem1: With frontend, package is too big**
  - We can split localizations (lang specific packages)
  - We can have server without frontend (preconfigured from XML?)
- **Problem2: Where to store data and config?**
  - Flash is not good for many changes (history,trends)
  - Ram is not good to store config :)
  - We need to store configuration data on flash (maybe import script on each boot?) and history in RAM (cache only?)
  - We need cli import/export
  - In some scenarios, long history is not important. Only actions.

http://Meteo4u.cz

- Community to monitor weather conditions using specialized HW
- Running on relatively slow HW
- Zabbix is used for monitoring and visualization
- **We do not want users to see Zabbix internals**
- **We want high speed and many requests per second**
  - We cache every output of Zabbix
  - Granularity 10min is OK
  - Predefined graphs for 1hour, 1day, 1week and 1month are OK. Cached on disk for simultaneous access
  - Redirected predefined urls to zabbix

http://Meteo4u.cz

Apache config:

```
AliasMatch /x/last/t$ /var/www/api/lastvalue.php
<LocationMatch ^/x/graphs>
  RewriteEngine on
  RewriteRule /x/graphs/p/1d$
     /chart2.php?graphid=93&width=595&period=86400 [P]
  RewriteRule /x/graphs/p/1w$
     /chart2.php?graphid=93&width=595&period=604800 [P]
</LocationMatch>
```

http://Meteo4u.cz

Apache config:

```
CacheEnable disk /x
<ocation /x>
 Header unset Expires
 Header unset Set-Cookie
 RequestHeader unset Cookie
 Header set Cache-Control "max-age=600, must-revalidate"
</Location>
```

Monitoring couple of devices

- We have lot of devices to manage, configure and monitor
- We hacked preinit and init script of OpenWrt (no need in future, we are working on OpenWrt provisioning system now)
- **Firstboot script:**
  - Download its configuration from server (tftp, http or https).
  - Upgrade is proceeded (sysupgrade, upgrade of specific packages, reboot)
  - Zabbix agent registers to zabbix server (autocreate) and sends all informations about itself.
  - Every step is logged into zabbix server. So we can setup triggers and actions
  - Device can ask zabbix server any time for specific parameters (using API and inventory)

Multi criteria network analysis

- Do you know what happens in your network?
- If you say „yes“, it means you don't know :)
- How do you want to find incidents, if you do not know what you are searching for? :)
- You can setup triggers and actions, but YOU are teacher of the system
- What will happen if teacher does not know any consequencies?
- In my work, I am trying to solve this
- Using GNU octave scripts for theoretical part

Statistical analysis

- We need to do statistical analysis over history and trends data
- Maybe we need to „better know“ what happened in trend hours? (only avg, min, max today, linear approximation could help)
- We want to find unique correlations of data
- If something goes wrong, correlations will change

Neural network analysis

- We need to use correlations, triggers and acknowledgements to teach NN
- We need to find abnormalities
- Analysis is „cheap“, we are only analysing data which we have
- We can split analysis into parts
- We can use free CPU time to compute it

Problems to solve..

- Should it be done externally (API, SQL)?
- Or internally (zabbix_server plugin)?
- Huge amount of data – we need to divide it to parts
- Too big treshold will find no abnormalities
- Other side, we have many false positives
- Do we need to store all data?

Conclusions

- Tool for analyzing data externally in Octave will be OSS and will be announced in forum. Anybody can analyze its data
- Great software, stay on!

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