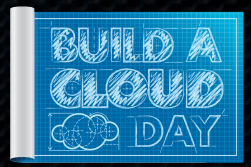
Monitoring at Cloud Scale

Julien Pivotto

Build a cloud Day Amsterdam
June 13th, 2013

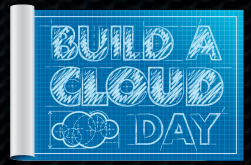
Table of contents

1. Introduction
   - DevOps
   - monitoringsucks
   - monitoringsucks
2. Around monitoring
   - The cloud
   - The past
   - Environment
   - Challenges
   - Infrastructure as code
3. Tools
   - Collectd
   - Logstash
   - Statsd
   - Graphite
   - Icinga
4. Conclusion
   - They work together
   - Sharing
   - There are solutions



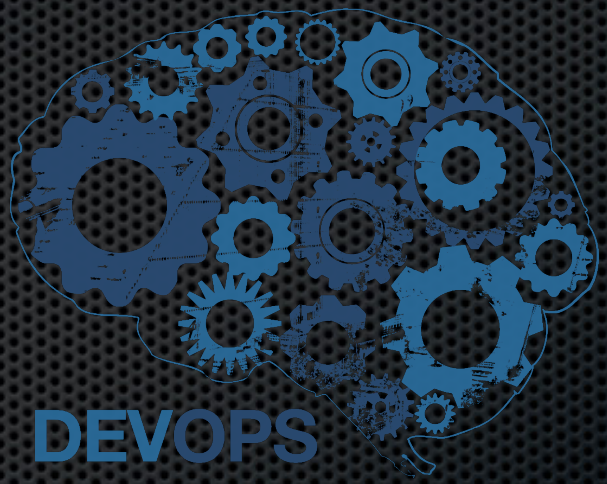
Julien Pivotto

- sysadmin @ inuits
- open-source defender for 7+ years
- devops believer
- @roidelapluie on twitter/github



What is that DevOps stuff again?

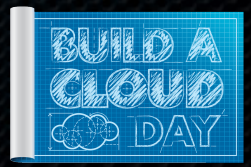
- Culture
- *(Lean)*
- Automation
- Measurement
- Sharing



Damon Edwards and John Willis

#monitoringsucks

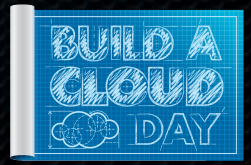
- https://github.com/monitoringsucks
- a movement to find a solution to monitoring
- the feeling that monitoring is stucked in the past



#monitoringlove

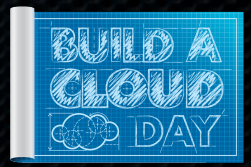
- then it turned into #monitoringlove
- relevant tools exist
- they just need to be used
- following the unix philosophy

we are going to explore some of them



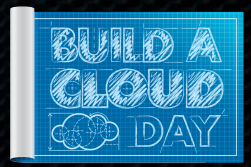
What is different in the cloud?

- Scale
- Velocity
- More changes, more often



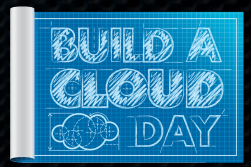
What do you need?

- scalability
- automation



time for retirement

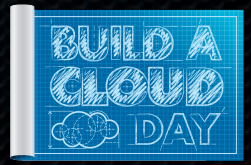
- forget all-in-one tools
- forget auto-discovery tools
- forget non-scalable tools
- forget tools you can not automate



forget about...

http://www.flickr.com/photos/mourner/150844753/

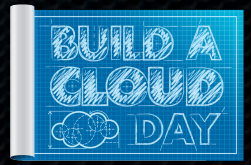
Zabbix



forget about. . .

http://www.flickr.com/photos/mourner/150844753/

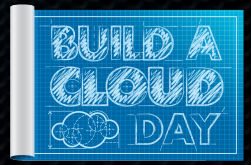
Centreon



forget about. . .

http://www.flickr.com/photos/mourner/150844753/

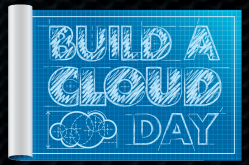
GroundWork



forget about. . .

http://www.flickr.com/photos/mourner/150844753/

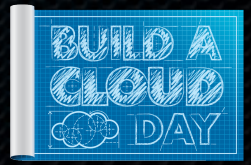
Cacti



forget about. . .

http://www.flickr.com/photos/mourner/150844753/

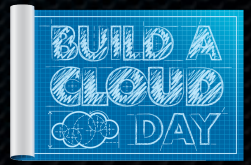
Hyperic



forget about. . .

http://www.flickr.com/photos/mourner/150844753/

BigBrother



forget about. . .

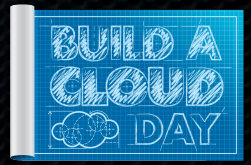
http://www.flickr.com/photos/mourner/150844753/

Munin

forget about. . .

http://www.flickr.com/photos/mourner/150844753/

Zenoss



Your infrastructure today

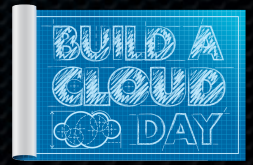
http://www.flickr.com/photos/bjbrake/235217140/

Your infrastructure tomorrow

http://www.flickr.com/photos/bjbrake/235217140/

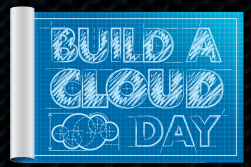
Your infrastructure in 6 months

http://www.flickr.com/photos/bjbrake/235217140/



Challenges

- Reproducability
- Speed
- Metrics
- Orchestration



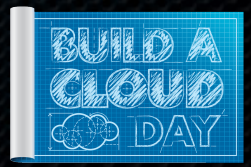
WANTED

http://www.flickr.com/photos/pagedooley/3124443099/

- Small tools
- Collect / Mangle
- Analyse / Act
- Visualize

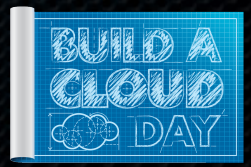
WANTED

The UNIX philosophy



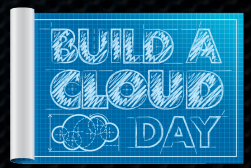
Automation

- One source of trust: puppet, chef, ...
- Exported resource
- Monitor in the same location you deploy
- Infrastructure-as-Code
- no autodiscovery tools



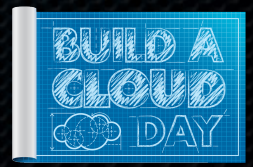
Automation

If it is not automated || not monitored
then it does not exist!



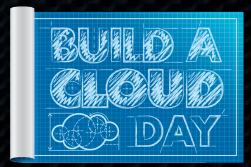
Example in puppet

- Create a definition for your application
- In that definition, add the configuration, the vhosts...
- Then export the monitoring (@@icinga_service)
- In bonus you can export DB configuration, etc...
- Use only the "meta" definition
- Collect the exported ressources (Nagios_service <||>)



Collectd

- Statistics collection daemon
- A lot of plugins available...
- Can send data to graphite
- Simple configuration

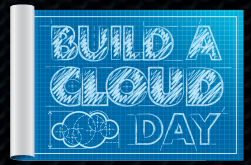


Collectd plugins

http://www.flickr.com/photos/juhansonin/3141561416/

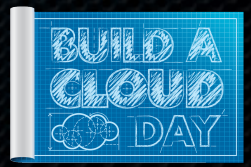
Collectd plugins

AMQP Apache APC_UPS Apple_Sensors Ascent Battery BIND Carbon ConnTrack ContextSwitch CPU CPUFreq CSV cURL cURL-JSON cURL-XML DBI DF Disk DNS E-Mail Entropy Exec FileCount FSCache GenericJMX gmond HDDTemp Interface IPMI IPTables IPVS IRQ Java libvirt Load LogFile LPAR MadWifi MBMon memcachec memcached Memory Modbus Monitorus Multimeter MySQL NetApp Netlink Network NFS nginx Notify_Desktop Notify_Email NTPd NUT olsrd OneWire OpenVPN OpenVZ Oracle Perl Pinba Ping PostgreSQL PowerDNS Processes Protocols Python Redis RouterOS RRDCacheD RRDtool Sensors Serial SNMP Swap SysLog Table Tail Tape TCPConns TeamSpeak2 TED thermal TokyoTyrant UnixSock Uptime Users UUID Varnish vmem VServer Wireless XMMS Write_Graphite Write_HTTP Write_MongoDB Write_Redis Write_Riemann ZFS_ARC



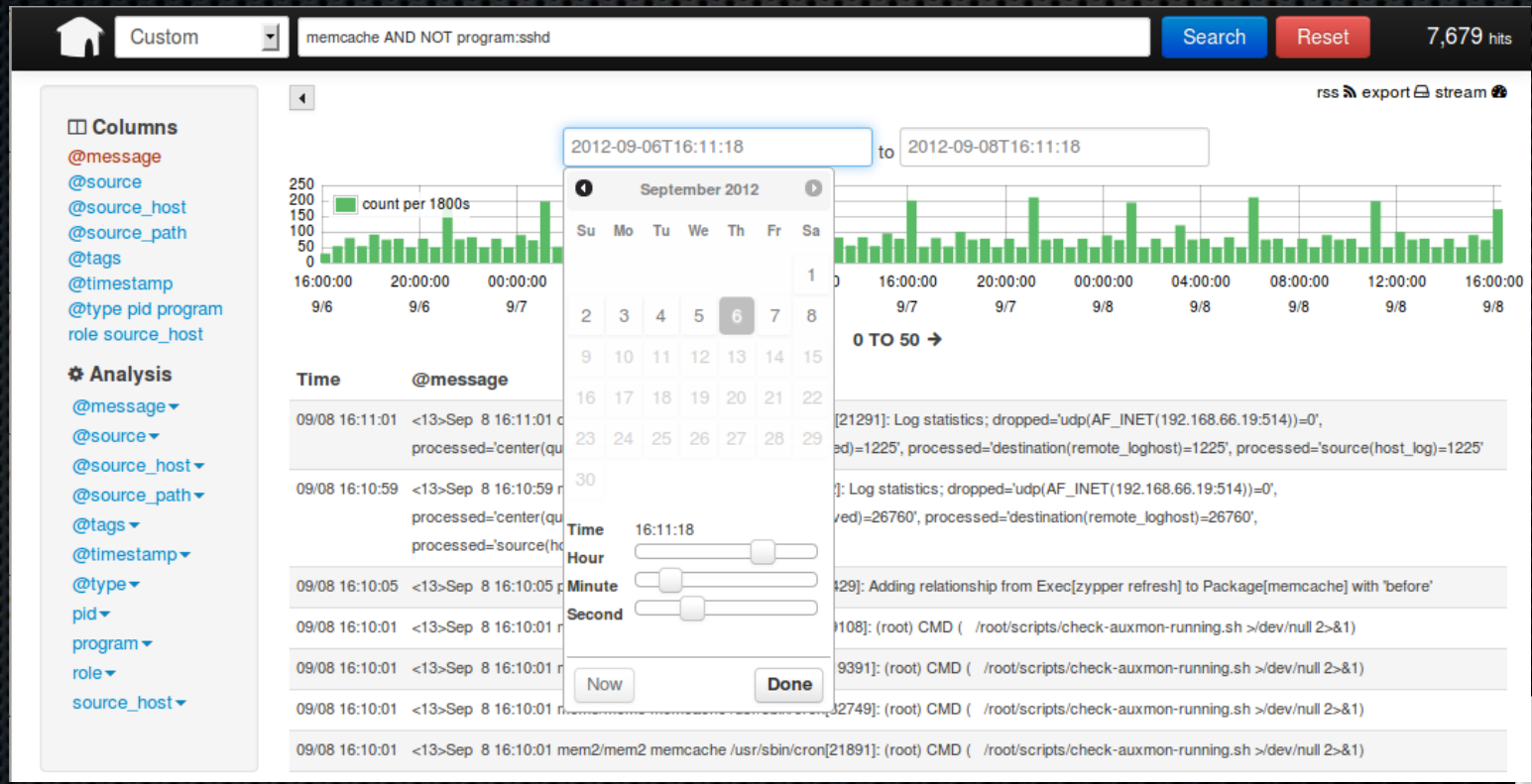
Logstash

- Ship logs from any source
- Filter them
- Index them
- Search them
- Backed with elasticsearch



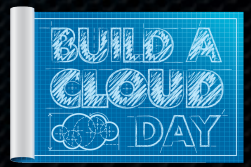
Kibana

http://kibana.org/images/screenshots/searchss.png



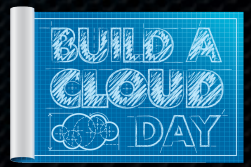
Statsd

- Stats aggregation
- Simple counters
- Flushes every XX seconds to graphite
- Text over UDP



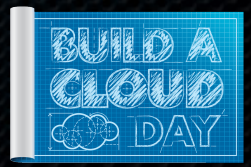
Statsd

```
echo "stats.sshd.login:1|c" | nc -u statsd.example.com 8125
```



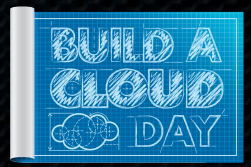
Graphite

- Graphing made simple
- A lot of helpers functions
- Listening on UDP and TCP
- Text over UDP/TCP



Send data to graphite

```
echo "stats.sshd.login 1 $(date +%s)" | nc -u graphite.example.com 2003
```



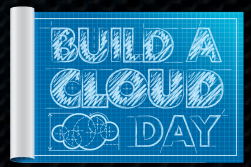
Graphite API

gdash

https://github.com/ripienaar/gdash

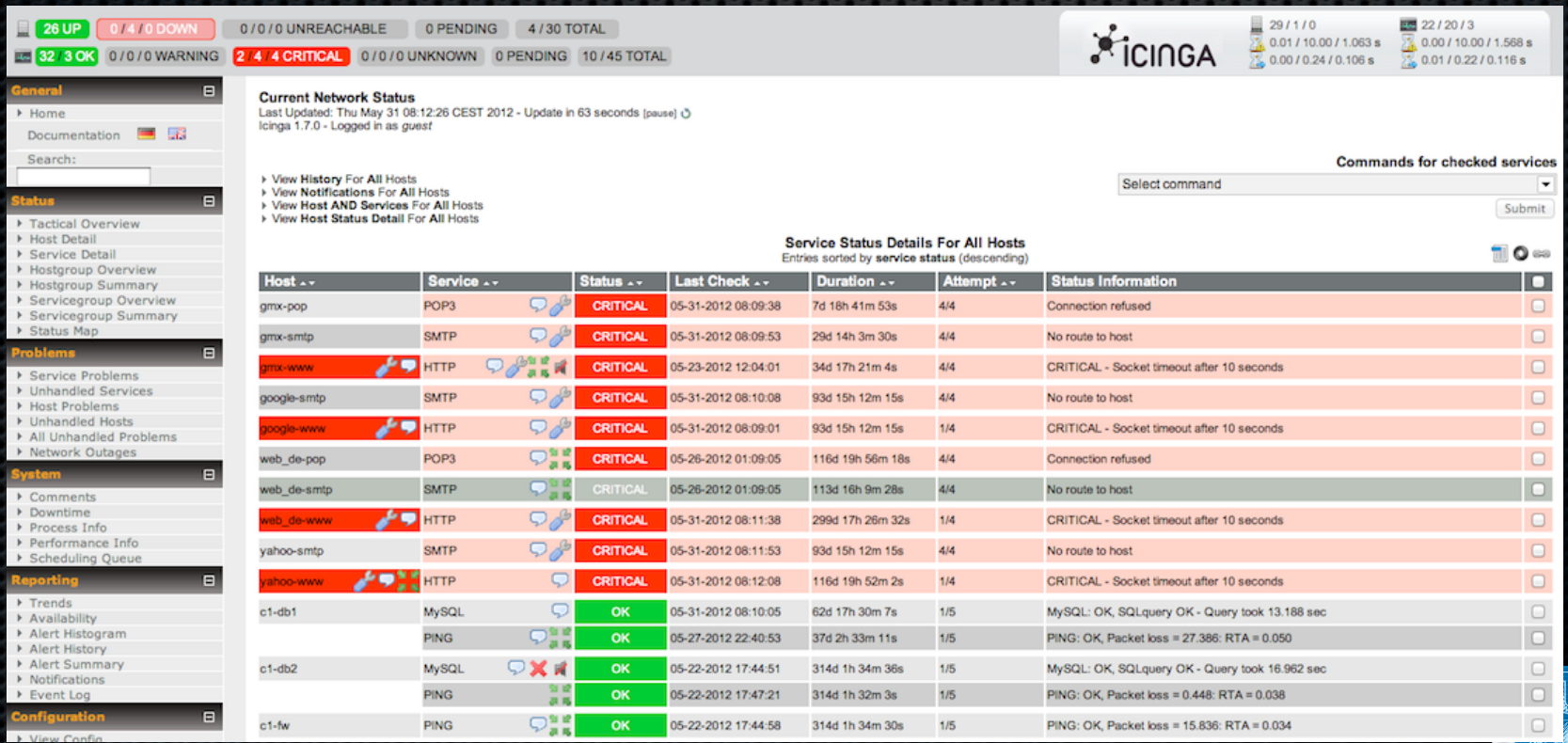
Icinga

- Fork of nagios
- Large and vibrant community
- Configuration compatible with nagios
- User-friendly interface
- Use Icinga Classic!



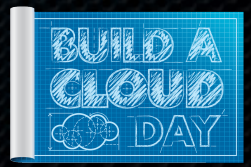
Icinga

https://icinga.org



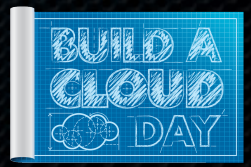
Toolchain from apache to nagios

- Apache ships logs to rsyslog
- Rsyslog ships logs to logstash
- Logstash ships metrics to statsd
- Statsd ships metrics to Graphite
- Icinga query metric from graphite
- https://github.com/etsy/nagios_tools



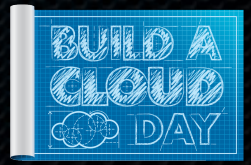
Reusing Icinga/Nagios perfdata

- Icinga performs various checks
- Icinga sends perfdata to graphite
- Graphite stores the data
- Gdash serves them inside dashboards
- https://github.com/roidelapluie/icinga-to-graphite



The metrics

- Everything can become a metric
- Performance metrics
- Usage metrics
- Business-valuable metrics
- People metrics
- Metrics are knowledge

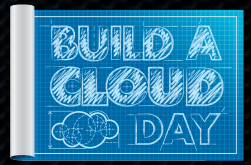


Metrics that matter

http://codeascraft.com/2011/02/15/measure-anything-measure-everything/

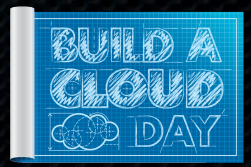
What have we seen?

- We have seen only open-source software
- Small, pluggable daemons
- Robust solutions
- Nice & user-friendly output
- They play together



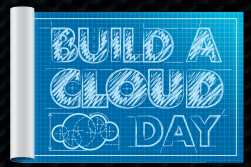
Homework

- Sensu
- Riemann
- dashing
- ExtreMon
- Esper
- Skyline
- Oculus



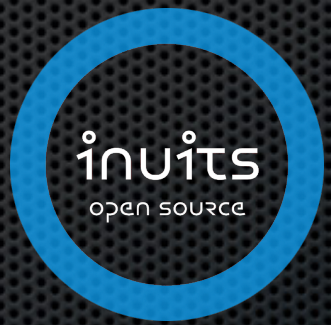
Try them yourself

https://github.com/KrisBuytaert/vagrant-graphite
https://github.com/KrisBuytaert/vagrant-puppet-logstash



Contact

Julien Pivotto
julien@inuits.eu
@roidelapluie



INUITS bvba
Duboisstraat 50
2060 Antwerp
Belgium
+32 473 441 636
https://inuits.eu