Keep an eye on your PostgreSQL clusters

Open PostgreSQL Monitoring & PostgreSQL Workload Analyzer

Julien Rouhaud

Dalibo - www.dalibo.org

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Monitoring ?

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- Service availability
  - Service, host, network...
  - Alerting
- Service performance
  - Graphing
  - Trending
  - Analysis
- At what cost ?
  - Open source projects

What already exists

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- Different kind of tools
  - Command line tools / datasources
  - Generic solutions with probes
  - Dedicated solutions

Command line

And data sources

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- Nice features
- But more useful for emergency situations
- Or need some external tool for best usage

Command line

Some examples

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- command line
  - pg_view
  - pg_activity
  - pgstats
- Data source
  - all pg_stat* catalog
  - pg_stat_statements, pg_stat_plans
  - pg_proctab

Probe

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- Gather informations for another tool
- Can sometimes be used in standalone
- Some examples
  - check_postgres
  - pg_monz

Dedicated solution

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- Complete for its purpose
- More pertinent
- But not numerous

OPM and PoWA ?

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- OPM
  - aim to be a dedicated solution
  - relies on existing or new probes and components
- PoWA
  - Dedicated performance solution

Ecosystem

Generic solution based on probes

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Name	Native graphing	Alerting
Nagios	No	Yes
Zabbix	Yes	Yes
Munin	Yes	Yes
Cacti	Yes	No

General Overview

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- Pros
  - Robust and mature
  - Adaptable
  - Extendable
- Cons
  - UI not flexible
  - Data not available for querying
  - Except check_postgres, lack of really complete datasource

Nagios

Specific

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- Graphing (with third part tool like OPM V2)
- PostgreSQL compatibility with
  - check_postgres (Bucardo)
  - check_pg_activity (OPM)
- Hard to configure

Zabbix

Overview

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- PostgreSQL compatibility with
  - pg_monz (only PG 9.2+)
  - postbix (no news since 2013)

Munin

Overview

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- Native PostgreSQL compatibility, and with
  - pyMunin

Cacti

Overview

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- PostgreSQL compatibility with
  - Some workaround with check_postgres (MRTG format)

What about OPM

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- And for Open PostgreSQL Monitoring ?

OPM

Architecture

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- Nagios
  - Scheduler
  - Alerting
- Probes
  - PG specific : check_pgactivity
  - And monitoring-plugin
- Storage
  - PostgreSQL :)
  - 9.3 or more
- GUI
  - Dedicated GUI

OPM

Overview

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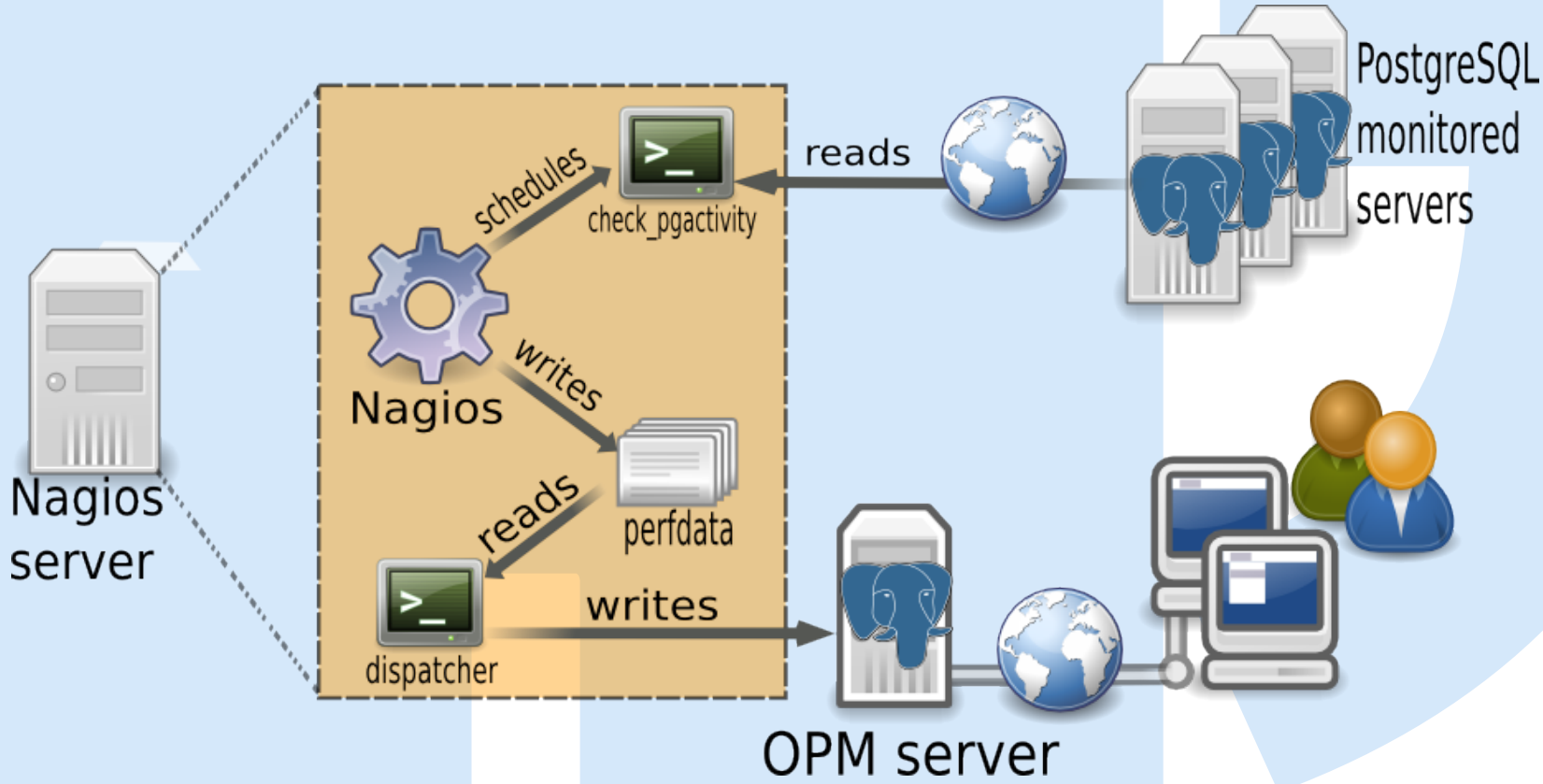

check_pgactivity

Design

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- Written from scratch, simpler code
- Provide lots of services
- Handle a small cache
- Better perfdata

check_pgactivity

New features

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- Handle multi-database connections transparently
- Can compute delta instead of raw values
- Handle units

check_pgactivity

New service examples

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- bgwriter statistics
- better bloat estimation
- Most important settings check

check_pgactivity

Enhanced service

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- better bloat estimation
- replication : pg_stat_replication or hot standby
- "Instant" hit ratio

User interface

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- Specific ACL
- More modern graphs
- Custom graph display, tags...

Ecosystem

Specific solution

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Name	Maintained	Aim	Alerting
pg_statsinfo	Yes	Generalist	Possible
pg_watch	Dead ?	Generalist	No
pgObserver	Yes	Performance	No
pgCluu	Yes	Generalist	No
PoWA	Yes	Performance	No

pg_statsinfo

Pros & cons

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- Pros
  - Useful metrics
- Cons
  - Reports on demand
  - Needs specific C extension (reboot required) on each monitored server

pgObserver

Pros & cons

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- Pros
  - Useful metrics
  - And novel metrics (like stored proc)
  - Dynamic reports
- But
  - Focused on performance

pgCluu

Pros & cons

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- Pros
  - Useful metrics
  - General overview
  - Easy to use
- Cons
  - Can be storage greedy
  - Need to generate reports

PoWA 2.0

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- A complete solution
  - Focused on performance
- Handle a lot of datasource
- Requires PG 9.4 or more
  - requires queryid exposure, since pg_stat_statements 1.2

What is PoWA

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- PostgreSQL extension : powa-archivist
  - A background worker
  - Dedicated snapshot, aggregation and purge functions
- Dedicated UI : powa-web

PoWA

Extensions handled

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- Existing extensions
  - pg_stat_statements
  - pg_proctab (WIP)
- New one
  - pg_qualstats
  - pg_stat_kcache
  - pg_track_settings (WIP)

pg_qualstats

Presentation

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- Gather real-time statistics on where clauses per query
  - SeqScan / indexScan
  - Operator
  - Number of execution
  - Filter ratio
  - ...

pg_qualstats

What it allows

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- Find missing indexes
  - Which could be partial
  - Or on several columns if some other queries could benefit from it
  - ...

pg_qualstats

What it allows

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- EXPLAIN normalized queries with real values
  - Most frequents
  - Most/Least filtering
  - ...

pg_stat_kcache

Presentation

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- Gather real-time per query system statistics

pg_stat_kcache

What it allows

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- Compute a real hit ratio (shared_buffers, system cache and disk)
- Show CPU consumption
  - global, per database and/or per query and/or per user
  - over time

Demo

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- demo-powa.dalibo.com powa // demo
- demo.opm.io opm // demo

For the future

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- Nagios optional from OPM
- Add ability to handle PoWA in OPM
- Better use of metrics
  - Trending / statistic analysis
  - Correlate informations
- Better index suggestion, global database analysis
- And much more...

Questions ?

DALIBO
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- julien.rouhaud@dalibo.com
- opm-users@googlegroups.com - powa-users@googlegroups.com
- github.com/OPMDG - github.com/dalibo/powa
- Thank you !