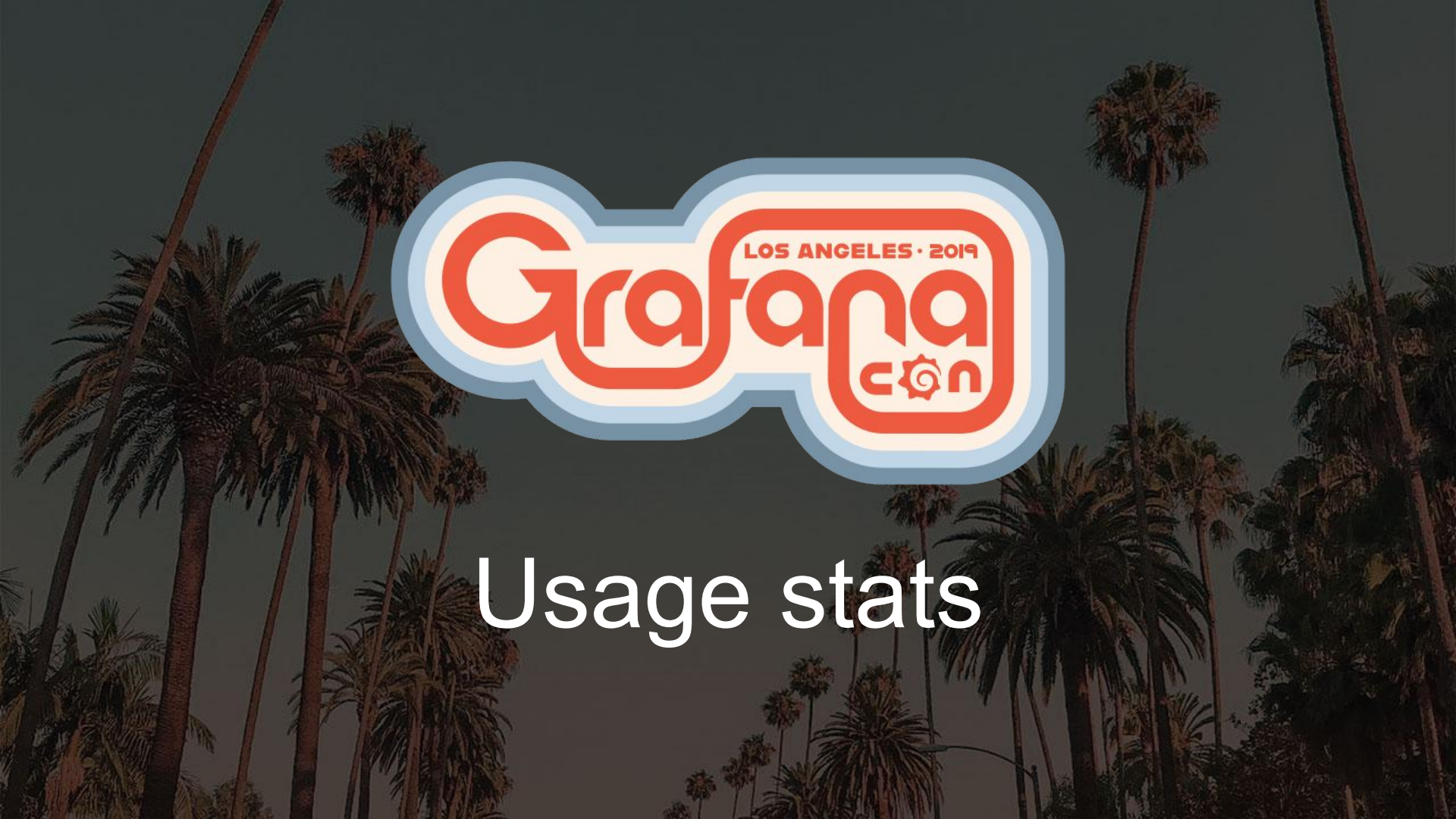
SQL Datasources in Grafana

Carl Bergquist & Marcus Efraimsson


DEMOCRATIZE
METRICS
Grafana
raintank



Usage stats


Mysql: 22000
Postgres: 7800
MSSQL: 3000
LOS ANGELES · 2019
Grafana CON

MySQL
System software

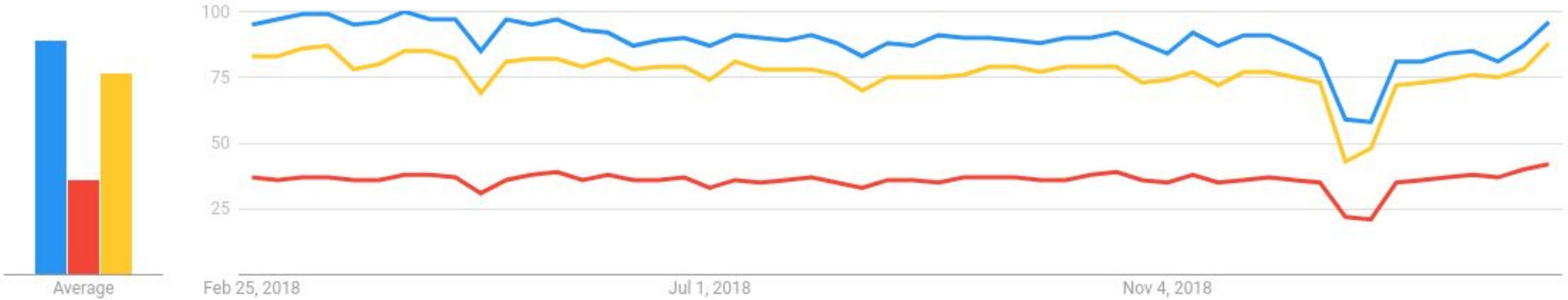
PostgreSQL
System software

Microsoft SQL Ser...
System software

+ Add comparison

Worldwide | Past 12 months | All categories | Web Search

Interest over time



Basic usage

Values

Time	source	datacenter	hostname	value
2019-02-22 09:22:17	frontend	America	server1	1.01 K
2019-02-22 09:22:17	frontend	America	server1	996.48
2019-02-22 09:22:17	frontend	America	server1	998.11
2019-02-22 09:22:17	site	America	server1	148.12

1 2 3 4 5 6 7 8 9

Queries to gdev-mysql

Add Query | Query Inspector | ?

A

```
SELECT createdAt as Time, source, datacenter, hostname, value
FROM grafana_metric WHERE hostname in($host)
```

Format as Table | Show Help | Generated SQL

Queries to gdev-mysql

Add Query | Query Inspector | ?

A

```
SELECT
  $__timeGroup(createdAt,'$summarize') as time_sec,
  avg(value) as value,
  'started' as metric
FROM
  grafana_metric
WHERE
  $__timeFilter(createdAt) AND
  measurement = 'payment.started'
GROUP BY 1, 3
ORDER BY 1
```

Format as | Time series | Query Builder | Show Help

Queries to -- Mixed --

A *(gdev-prometheus)*

```
go_goroutines * 6
```

Legend | legend format | Min step | | Resolution | 1/1

B *(gdev-mysql)*

```
SELECT
  createdAt AS "time",
  measurement AS metric,
  value
FROM grafana_metric
WHERE
  $__timeFilter(createdAt)
ORDER BY createdAt
```

Format as | Time series | Query Builder | Show Help | Generated SQL

Variables

+ New

Variable	Definition		
$user	SELECT username as __text, user_id as __value FROM users	Duplicate	✖

User Dashboard

User

bergquist
marefr

Selected user value: 2

What’s new for SQL datasources

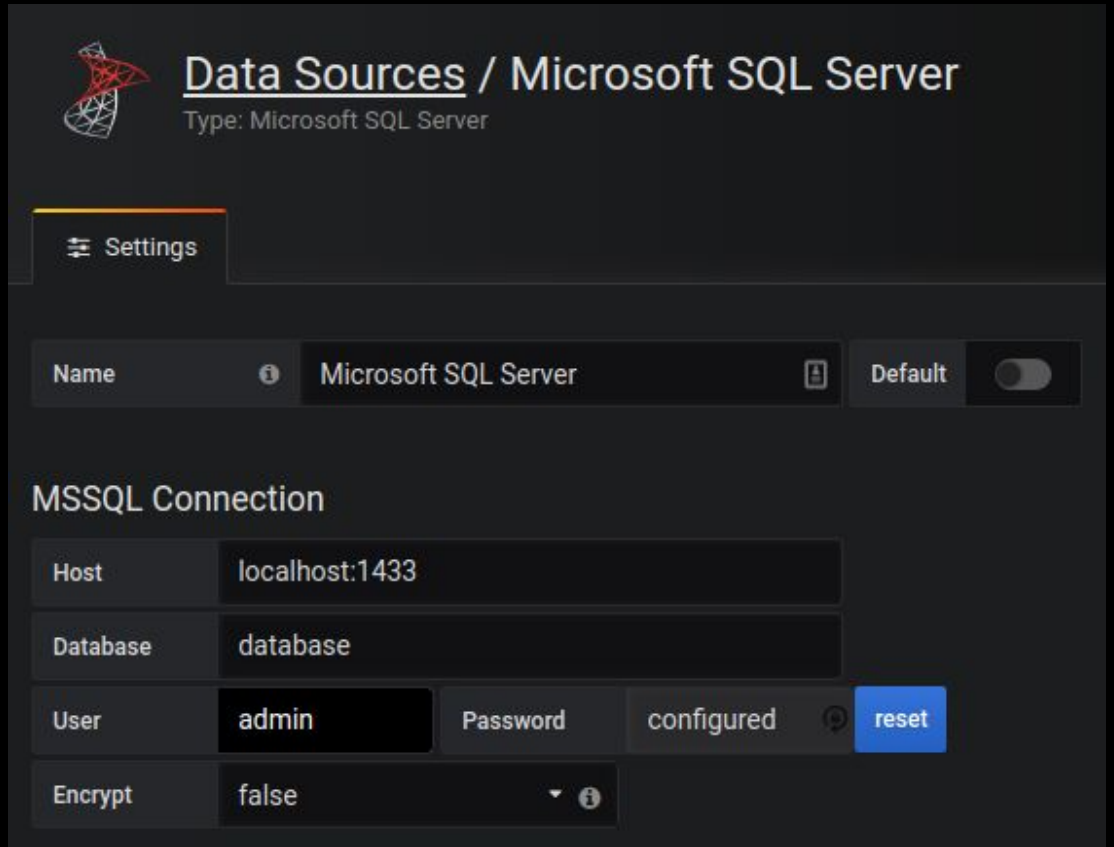
Up until Grafana 5.0

- MySQL in 4.3
- Postgres in 4.6

(Oracle Database available as a premium plugin)

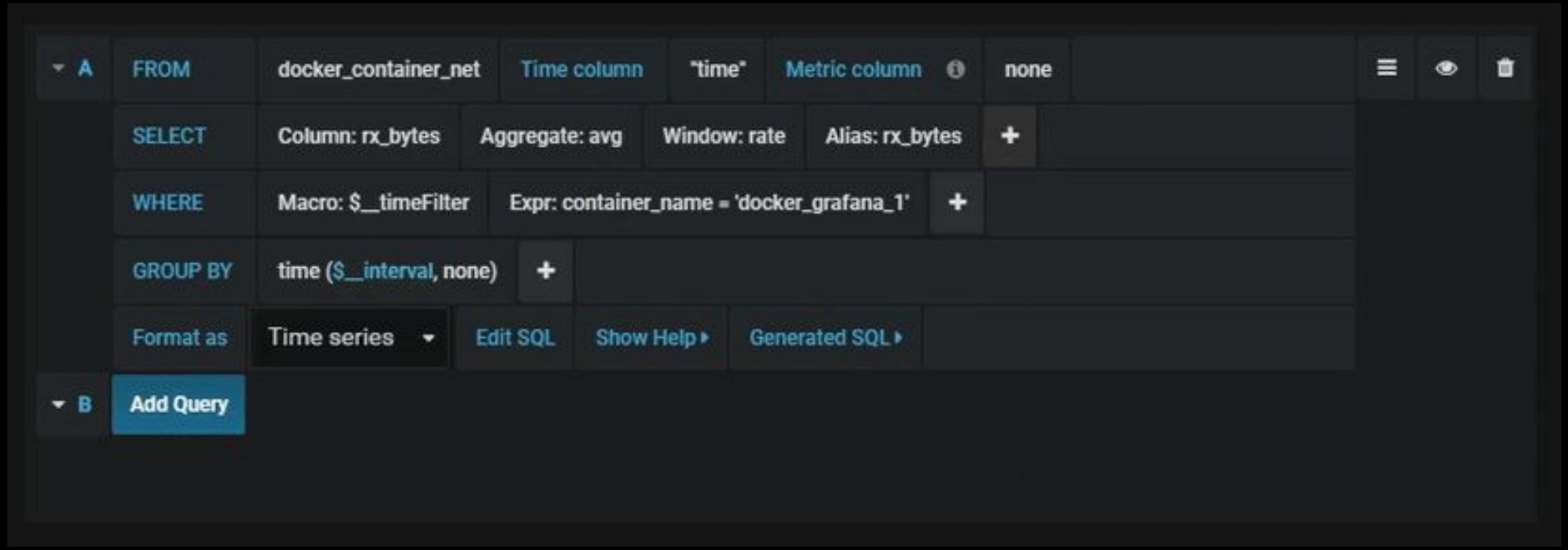
Grafana 5.1

Microsoft SQL Server support

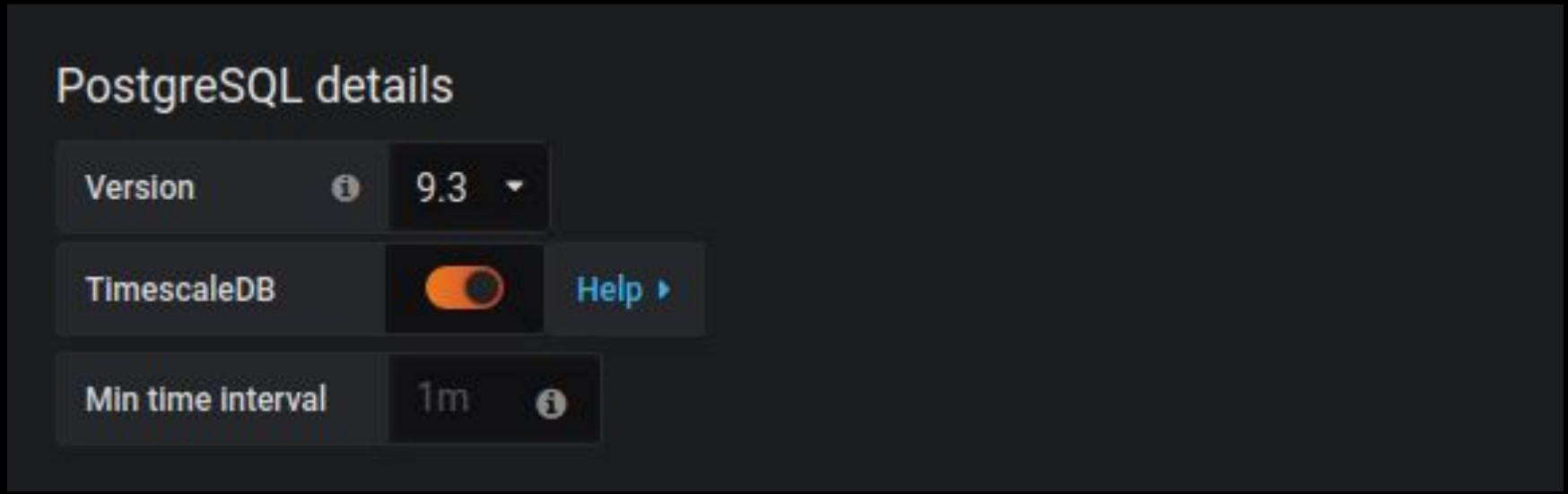


Grafana 5.3

Postgres graphical query builder

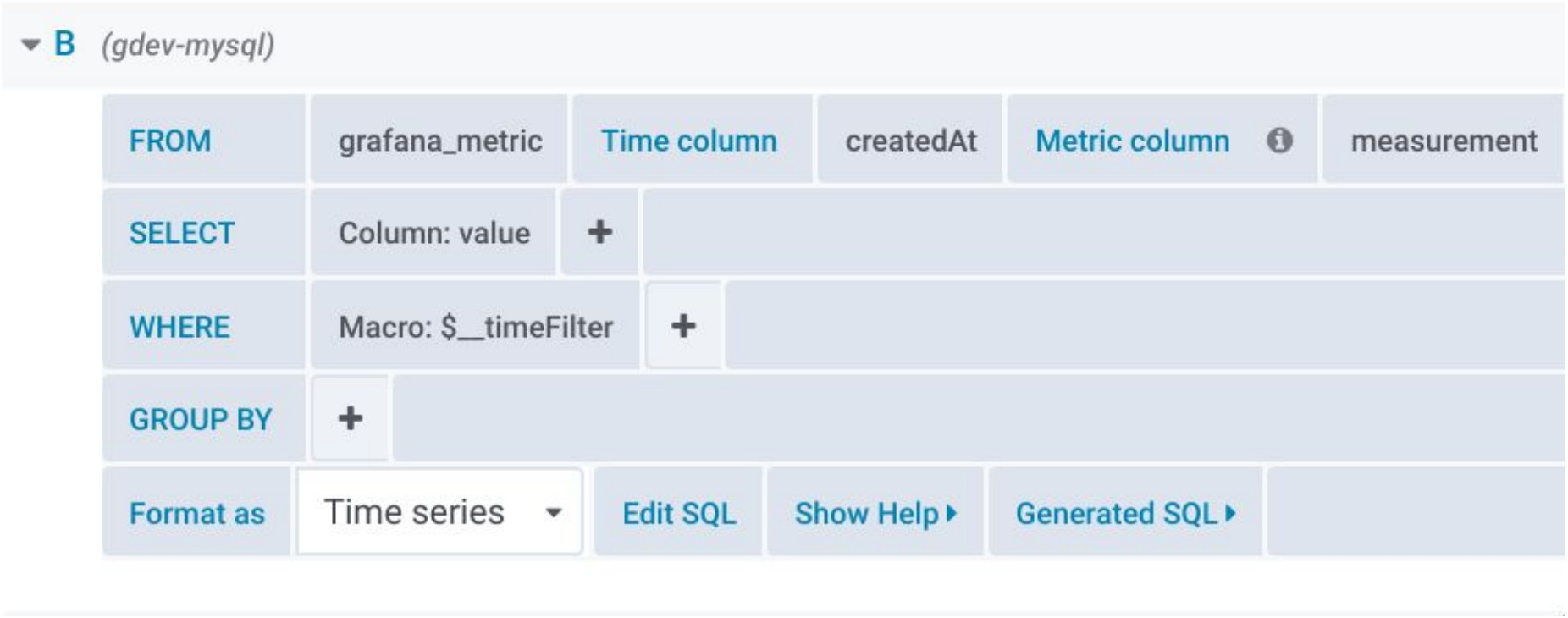


Postgres TimescaleDB extension support



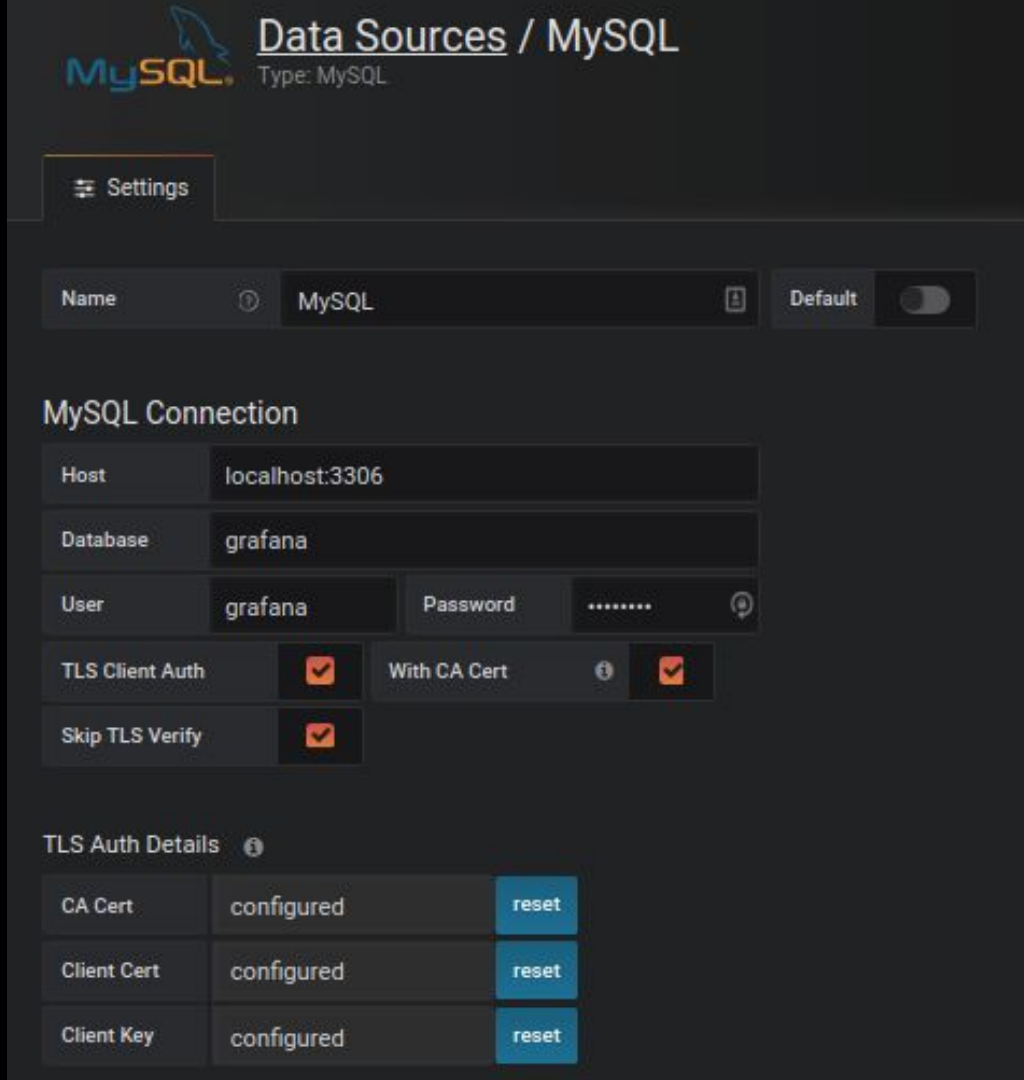
Grafana 5.4

MySQL graphical query builder



Grafana 6.0

MySQL SSL support

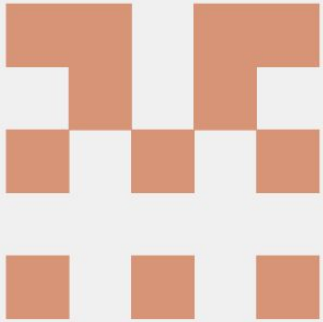


svenklemm (Sven Klemm)

GitHub, Inc. [US] | https://github.com/svenklemm

Search or jump to… /

Pull requests Issues Marketplace Explore



Sven Klemm

svenklemm

Follow

Block or report user

PRO

@timescale

Dresden, Germany

Overview Repositories 17 Projects 0 Stars

Pinned repositories

timescaledb

Forked from timescale/timescaledb

An open-source time-series database optimized for fast ingest and complex queries. Engineered up from PostgreSQL, packaged as an extension.

C

grafana

Forked from grafana/grafana

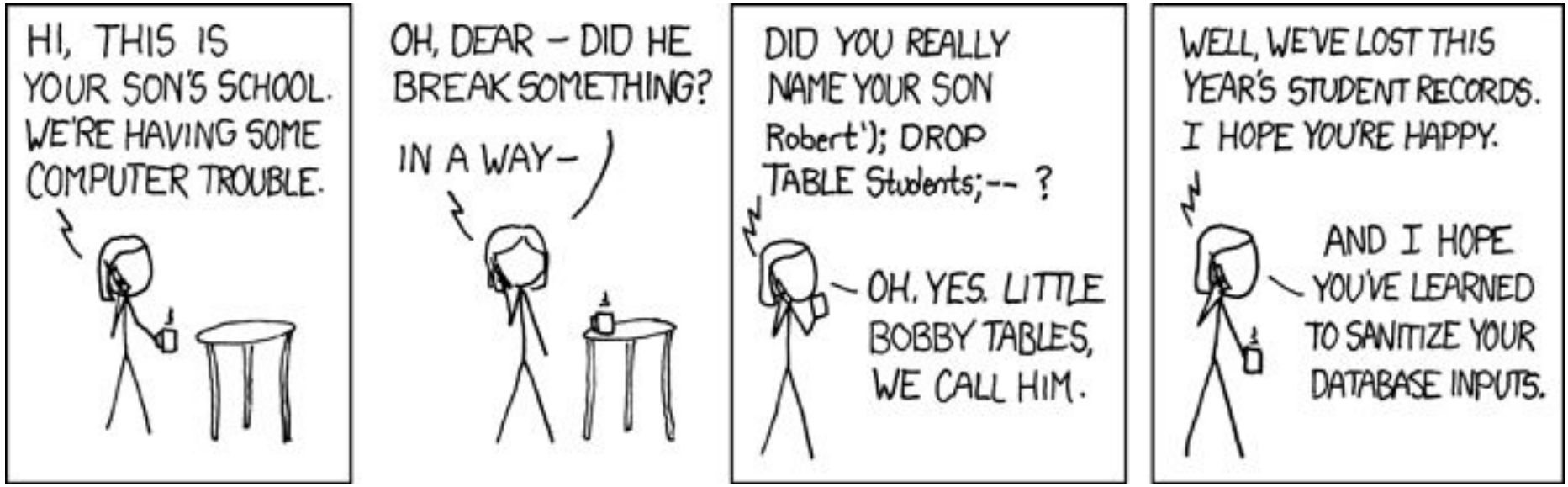
Grafana with PostgreSQL datasource

TypeScript 1

docs.timescale.com-content

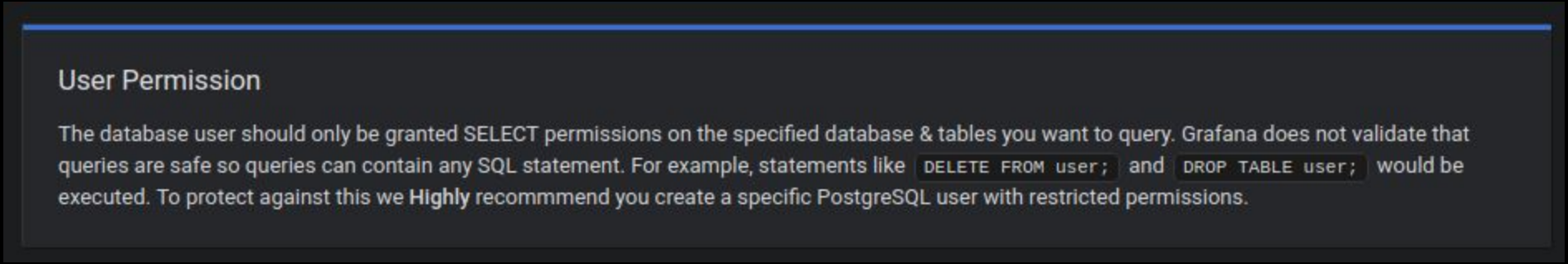
Forked from timescale/docs.timescale.com-content

Tips and tricks!


HI, THIS IS YOUR SON'S SCHOOL. WE'RE HAVING SOME COMPUTER TROUBLE.
OH, DEAR – DID HE BREAK SOMETHING?
IN A WAY–
DID YOU REALLY NAME YOUR SON Robert'); DROP TABLE Students;-- ?
OH. YES. LITTLE BOBBY TABLES, WE CALL HIM.
WELL, WE'VE LOST THIS YEAR'S STUDENT RECORDS. I HOPE YOU'RE HAPPY.
AND I HOPE YOU'VE LEARNED TO SANITIZE YOUR DATABASE INPUTS.

Permissions

- Grafana cannot sanitize the database input
- Only grant select permissions on database and tables for database user



Performance

- Easy to write really expensive queries (SELECT * FROM)
- Can slow database server down
- Can hang browser where Grafana is used
- Use a separate database from production/data warehouse

Time zones

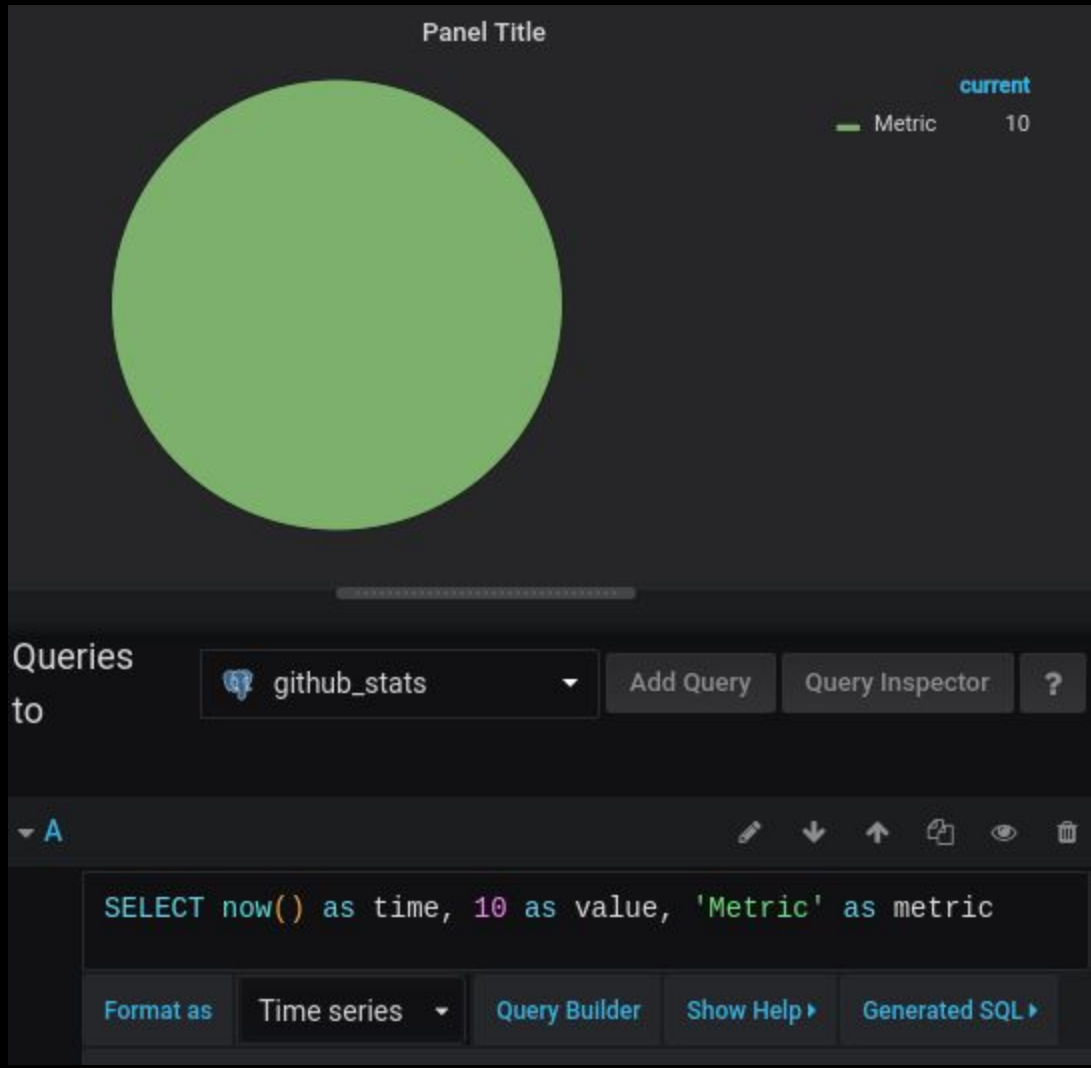
- Run Grafana and database server on UTC time zone
- Use time zone-aware data types for storing dates
- Use epochs (seconds since 1970)

Time series queries

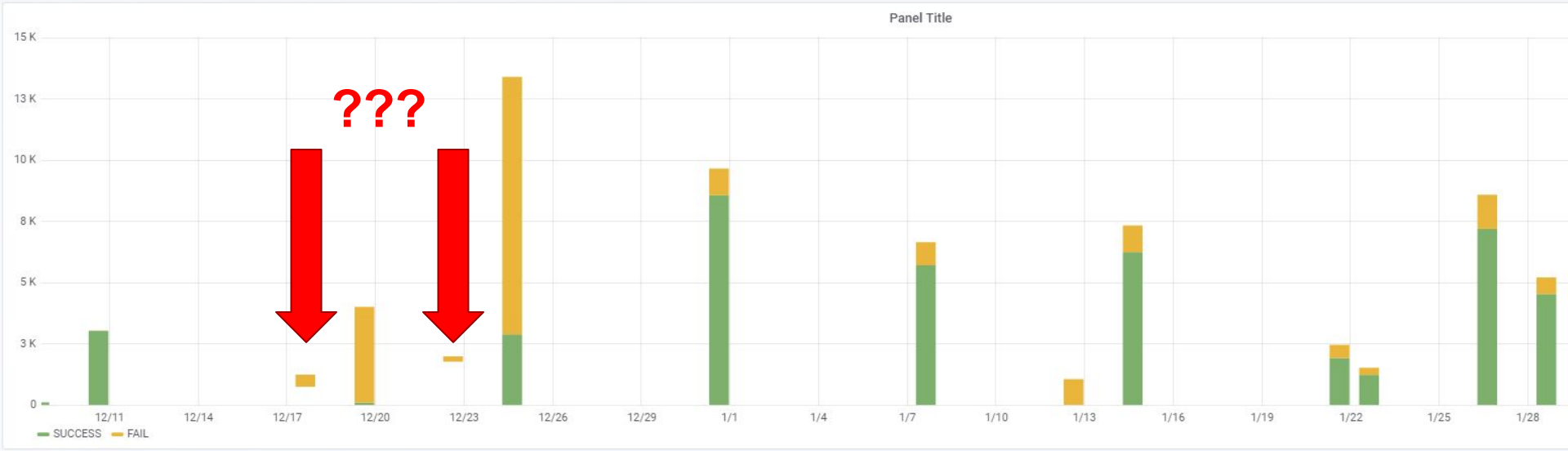
- Most panels expects time series data
- Must include a column named time

Pie Chart panel

- Without having a time column?
- You create one



Graph panel - stacked bar chart



Graph | General | Metrics | Axes | Legend | Display | Alert | Time range

Draw options

Series overrides (0)

Thresholds (0)

Draw Modes

Bars	☑
Lines	☐
Points	☐

Mode Options

Fill	1
Line Width	1
Staircase	☐
Point Radius	5

Hover tooltip

Mode	All series
Sort order	None
Stacked value	individual

Stacking & Null value

Stack	☑
Percent	☐
Null value	null as zero

Graph panel - stacked bar chart

- Need to supply a value for every interval
- Use $__timeGroup/$__unixEpochGroup macro with fill parameter

$__timeGroup(dateColumn,‘5m’, 0)
$__unixEpochGroup(dateColumn,‘5m’, 0)

Grafana GitHub stats

Carl Bergquist & Marcus Efraimsson

Background

Pull requests 94 | ZenHub | Projects 3 | Wiki | Insights

February 17, 2019 – February 24, 2019

Period: **1 week**

Overview

64 Active Pull Requests

108 Active Issues

42 Merged Pull Requests	**22** Proposed Pull Requests	**62** Closed Issues	**46** New Issues

Excluding merges, **17 authors** have pushed **79 commits** to master and **138 commits** to all branches. On master, **234 files** have changed and there have been **4,707 additions** and **1,651 deletions**.

GitHub Insights

Google Docs

Background cont.

- Pull request activity kept growing

- WHY?
  - Probably because Grafana Labs are growing?
  - We maybe have a lot of new contributors?
  - Non-Grafana Labs contributors are probably as active as before?

- Clearly needed a solution to remove the uncertainty!

Problem description

We want to measure and visualize GitHub activity of Grafana Labs vs contributors over time to make sure we have a healthy community and keep growing the contributor base

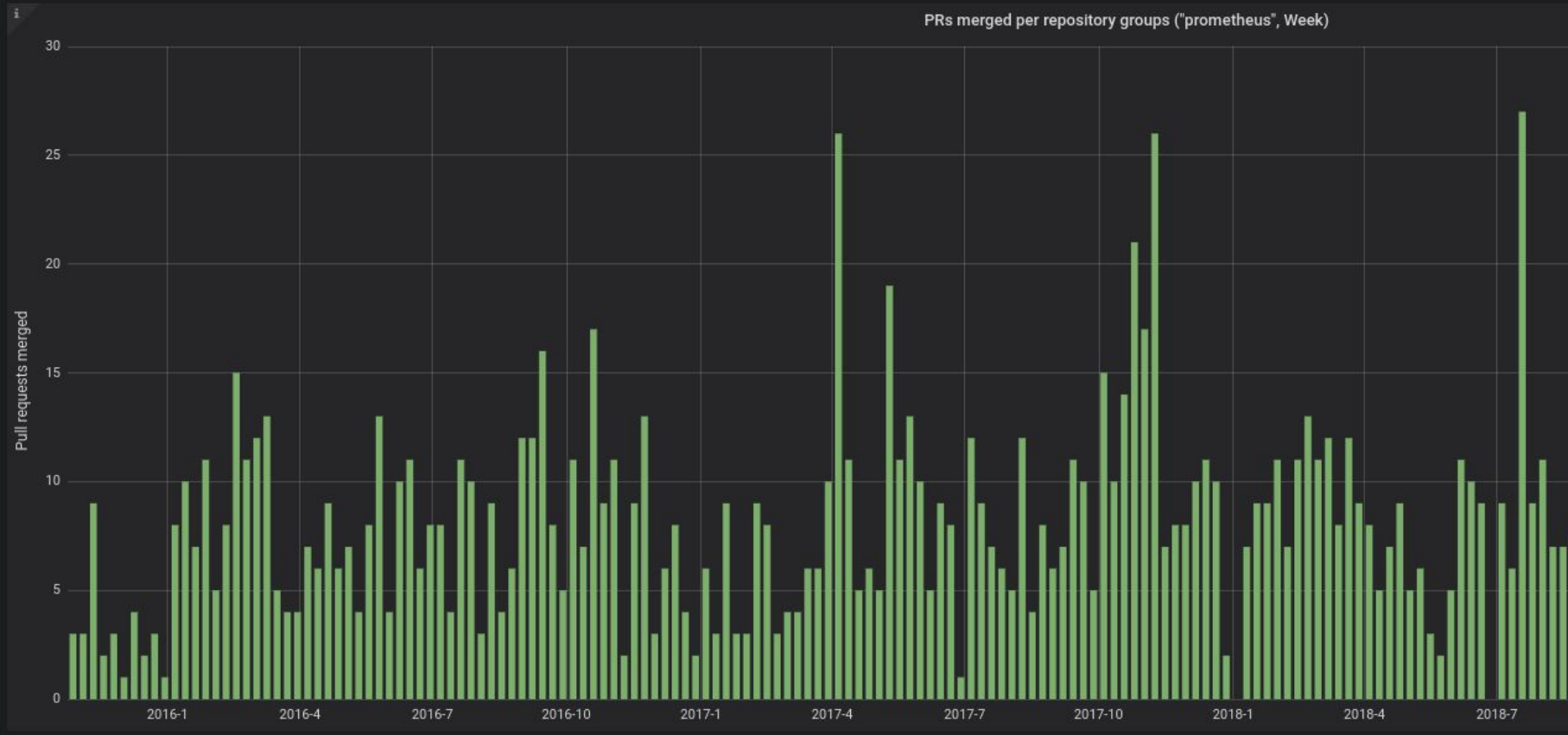
Solution

- Process GitHub events
- Build pre-aggregated views
- Store in a relational database
- Visualize in Grafana
- Highly inspired by CNCF devstats

https://prometheus.devstats.cncf.io/d/24/prs-merged-repository-groups?orgId=1&var-period=w&var-repogroups="prometheus"

PRs merged repository groups

Period Week | Repository group "prometheus" | Releases



Relational database schemas

```
github_stats_streams=# select * from pr_activity limit 30;
    time    | period |              repo                | proposed_by |  opened  |  merged  | closed_with_unmerged_commits
------------+--------+----------------------------------+-------------+----------+----------+------------------------------
 1420070400 | m      | grafana/grafana                  | Contributor |       10 |        6 |                            2
 1420243200 | d      | grafana/grafana                  | Contributor |        2 |        2 |                            0
 1419811200 | w      | grafana/grafana                  | Contributor |        2 |        2 |                            0
 1420070400 | q      | grafana/grafana                  | Contributor |       48 |       23 |                           21
 1420070400 | y      | grafana/grafana                  | Contributor |      399 |      266 |                          137
 1420761600 | d7     | grafana/grafana                  | Contributor | 0.428571 | 0.285714 |                     0.285714
 1422748800 | m      | grafana/grafana                  | Contributor |        9 |        4 |                            2
 1422748800 | m      | grafana/grafana                  | Grafana Labs |        3 |        3 |                            0
 1420416000 | d      | grafana/grafana                  | Contributor |        1 |        0 |                            0
 1420416000 | w      | grafana/grafana                  | Contributor |        2 |        0 |                            2
 1420070400 | q      | grafana/grafana                  | Grafana Labs |       12 |       10 |                            0
 1420070400 | y      | grafana/grafana                  | Grafana Labs |       59 |       48 |                           12
 1420848000 | d7     | grafana/grafana                  | Contributor | 0.142857 |        0 |                     0.285714
 1420934400 | d7     | grafana/grafana                  | Contributor | 0.285714 |        0 |                     0.285714
 1425168000 | m      | grafana/grafana                  | Contributor |       29 |       13 |                           17
 1420502400 | d      | grafana/grafana                  | Contributor |        0 |        0 |                            1
 1421020800 | w      | grafana/grafana                  | Contributor |        3 |        3 |                            0
 1427846400 | q      | grafana/grafana                  | Contributor |       85 |       60 |                           33
 1451606400 | y      | grafana/clock-panel              | Contributor |        2 |        1 |                            1
 1421020800 | d7     | grafana/grafana                  | Contributor | 0.285714 | 0.428571 |                     0.285714
 1421107200 | d7     | grafana/grafana                  | Contributor | 0.285714 | 0.428571 |                     0.142857
 1425168000 | m      | grafana/grafana                  | Grafana Labs |        9 |        7 |                            0
 1420675200 | d      | grafana/grafana                  | Contributor |        0 |        0 |                            1
 1421625600 | w      | grafana/grafana                  | Contributor |        3 |        1 |                            0
 1427846400 | q      | grafana/grafana                  | Grafana Labs |       13 |        9 |                            6
 1451606400 | y      | grafana/clock-panel              | Grafana Labs |        2 |        2 |                            0
 1451606400 | y      | grafana/grafana-plugin-repository | Contributor |       53 |       47 |                            7
```

Relational database schemas optimized for

- Ease of use in Grafana
- Separation of “business logic” and visualization logic
- Performance

Demo

Next steps?

- Make dashboards publicly available on play.grafana.org
- Make it easier to use for other projects/companies
- Process GitHub events older than 2015-01-01
- Track bugs, feature requests and feature areas?
- Other kinds of visualizations?

We ❤️ contributions

Resources

- Soon available on https://play.grafana.org
- Source code: https://github.com/grafana/devtools
- Public GitHub events archive: https://www.gharchive.org/
- https://all.devstats.cncf.io
- https://github.com/cncf/devstats