

Percona

Keeping Open Source Open

By Charly Batista

Postgres Tech Lead

@

Percona

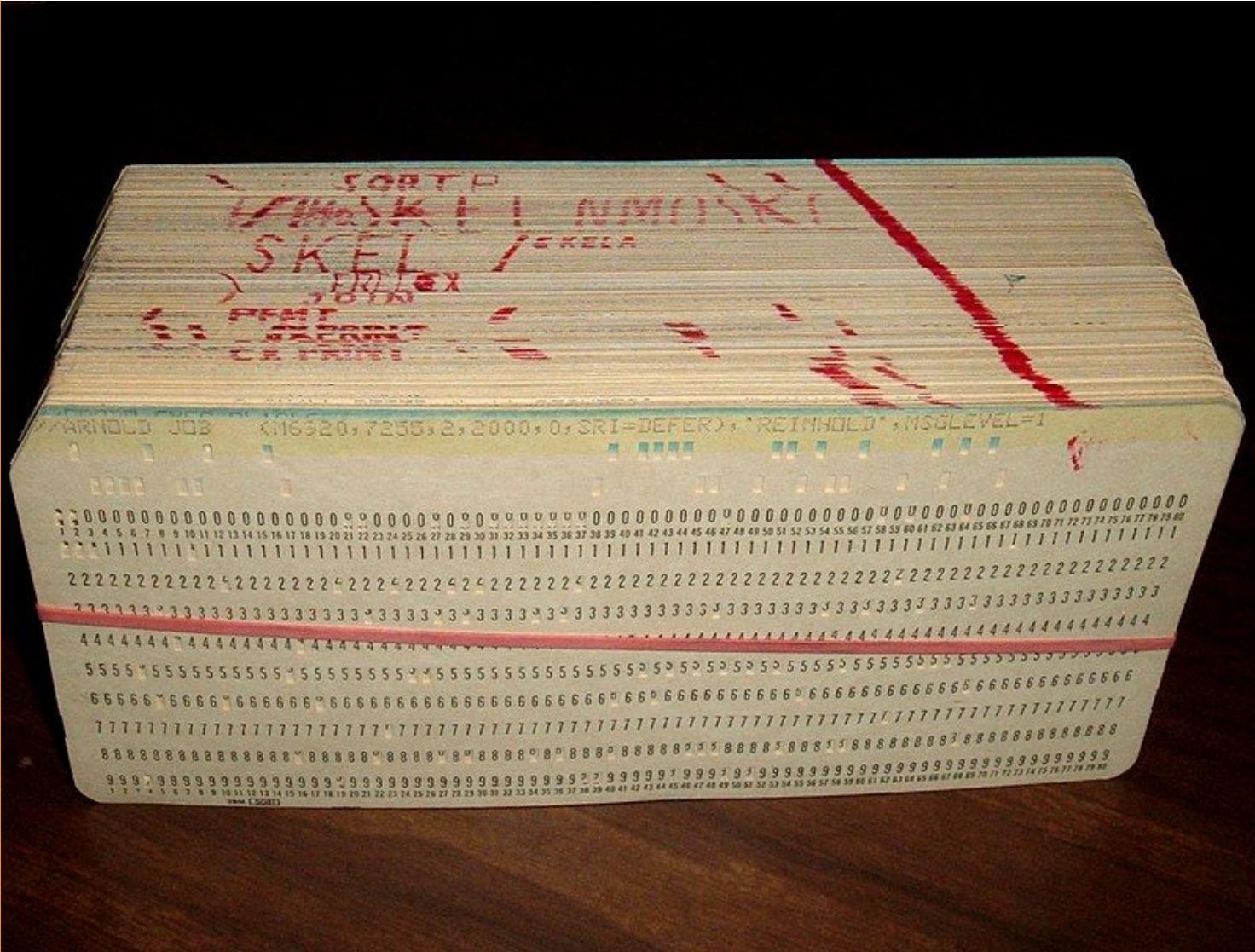
Postgres life: Migrations, Cloud, Kubernetes, Infrastructure as a Code, DBaaS... The modern challenges and how to survive them!

Long ago life
used to be
simpler



A database used
to be...

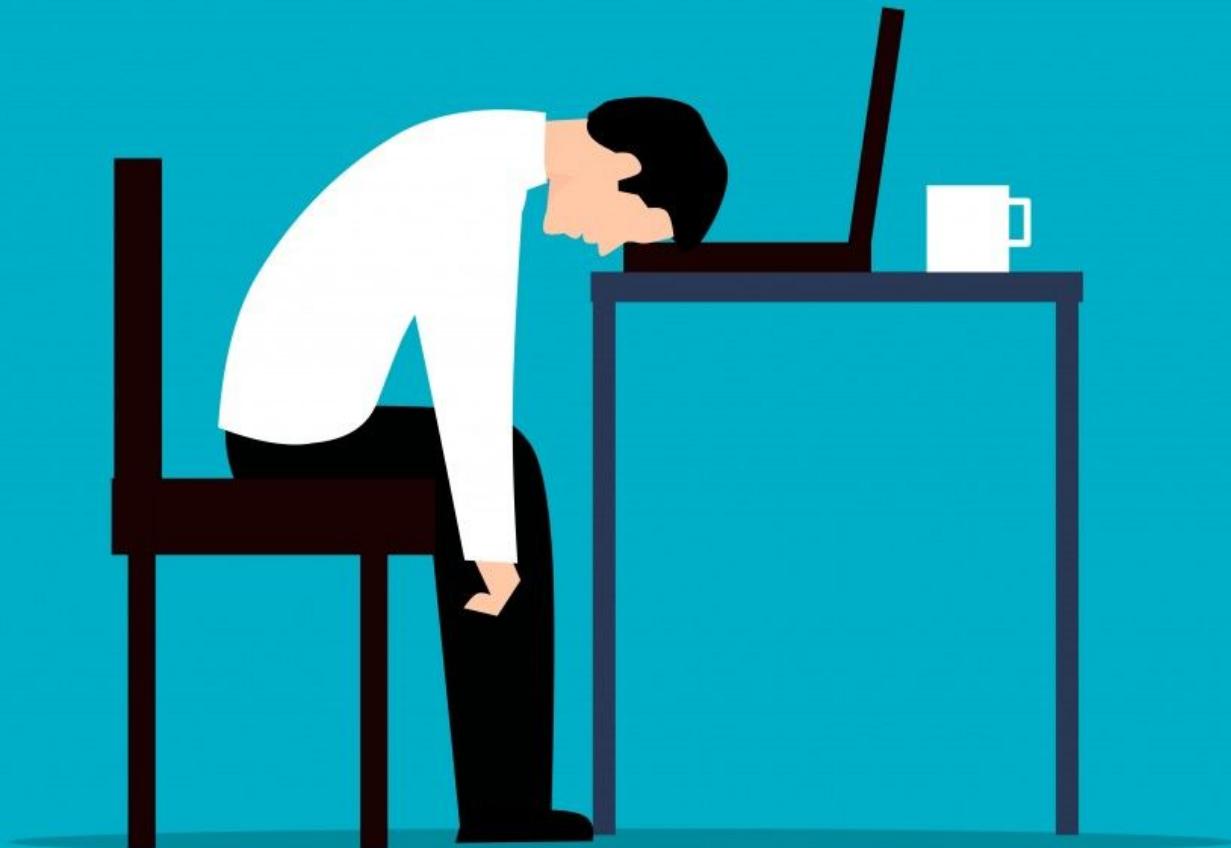
Jus a database!



We used to
have 3 or 4
database
systems



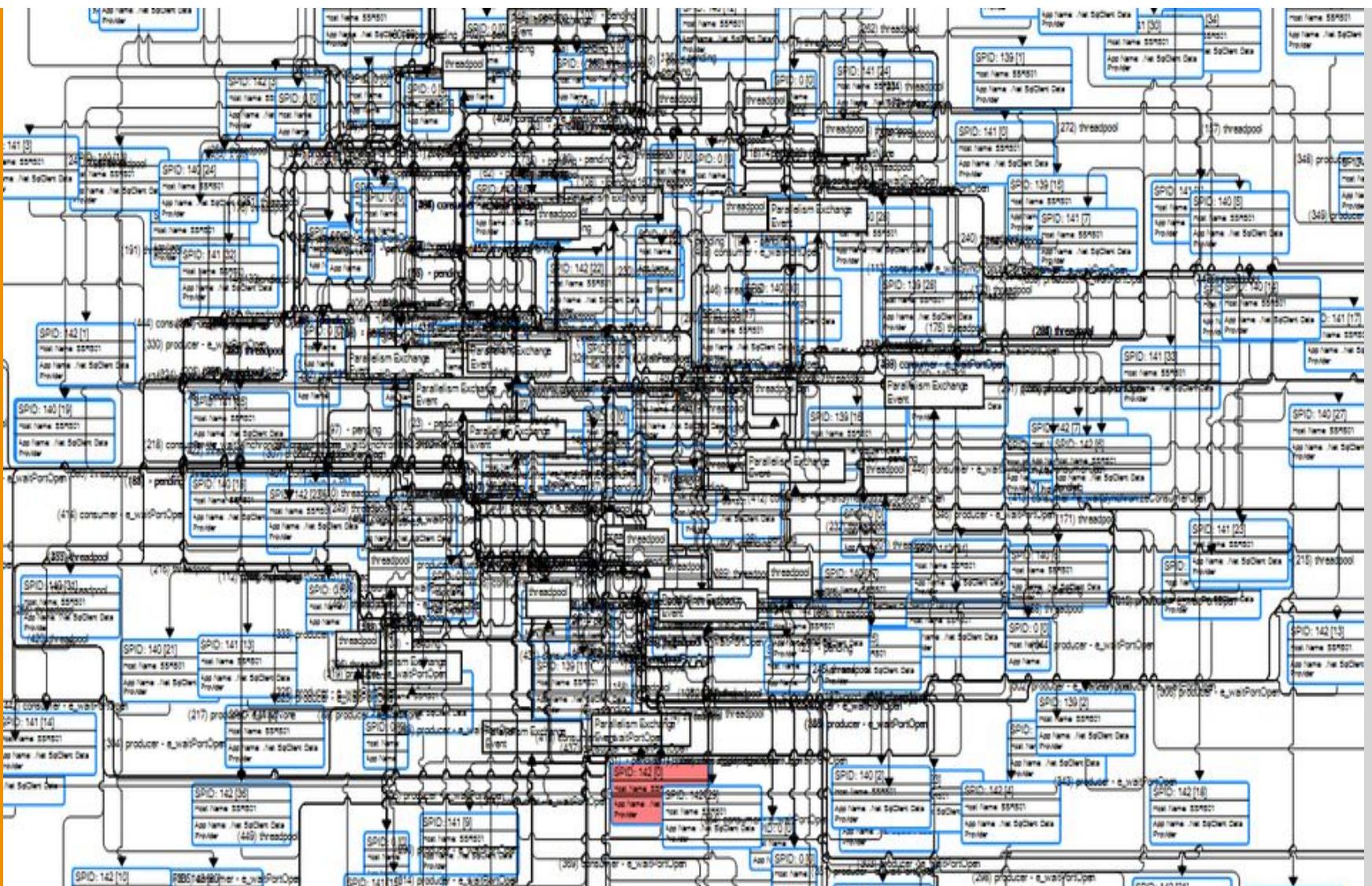
The DBA's life
didn't get much
of excitement!



We used to
install few
database
servers...



Deploy simple schema changes...



<https://tsqlprincess.wordpress.com/2017/01/09/musings-of-a-database-conversion-scribe/>

Take care of the
backups to be
able to recover
from a disaster.



Even the
backups were
simpler



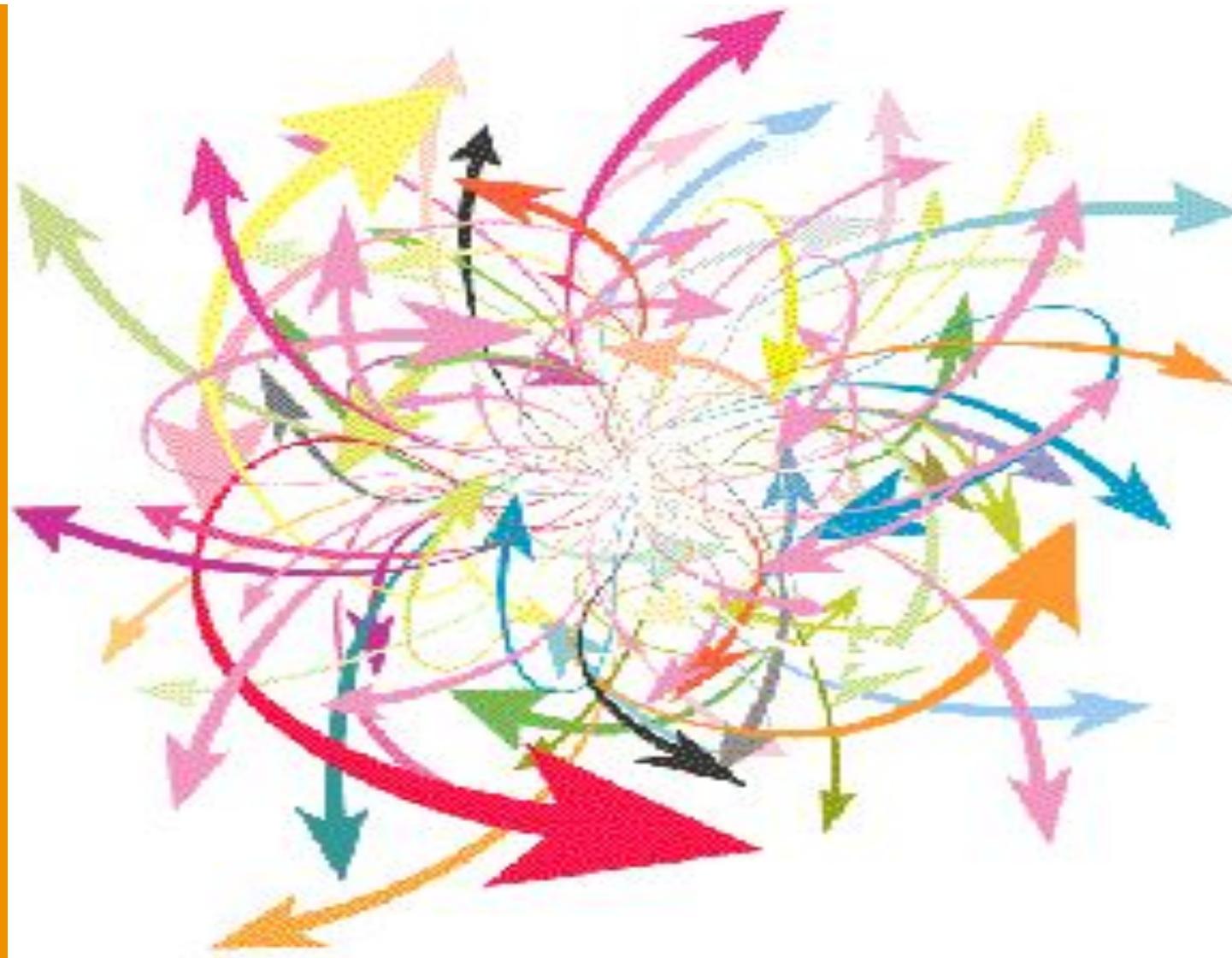
<https://www.ihaveapc.com/2011/11/a-geeks-spider-web/>

Life was great!



<https://saproj.blogspot.com/2020/09/india-happiness-report-2020-mizoram.html>

Then things
started
changing...



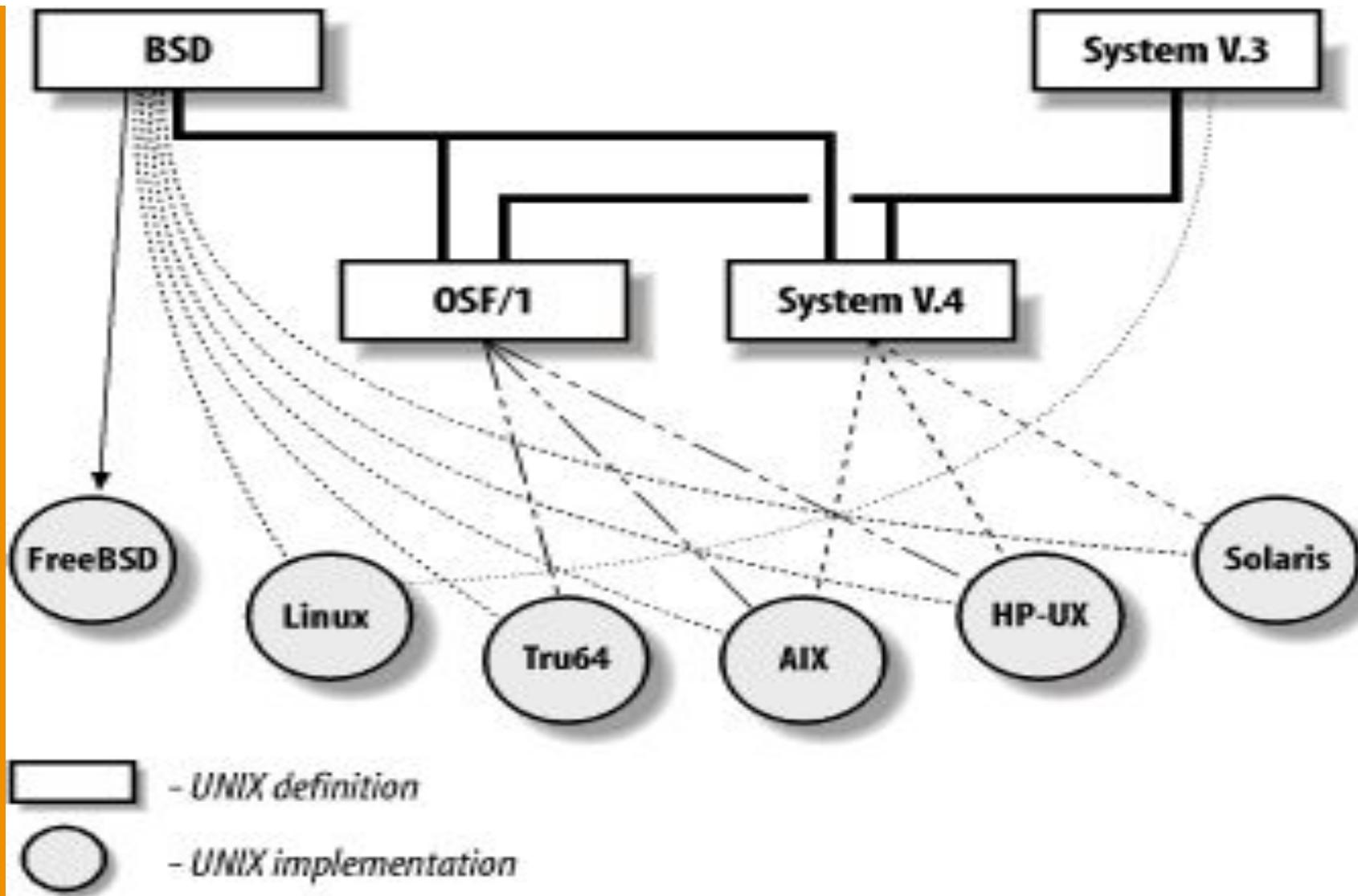
<https://billringle.com/reduce-your-switching-costs-to-become-more-productive-and-profitable/arrows/>

First this
Open
Source
thing



<https://www.intuit.com/blog/innovation/building-a-culture-of-open-source-at-intuit/>

New OS'es
started popping
everywhere



<https://www.oreilly.com/library/view/essential-system-administration/0596003439/pr03s01.html>

Then, we
started getting
an invasion of
new
database
systems!



TIMESCALE

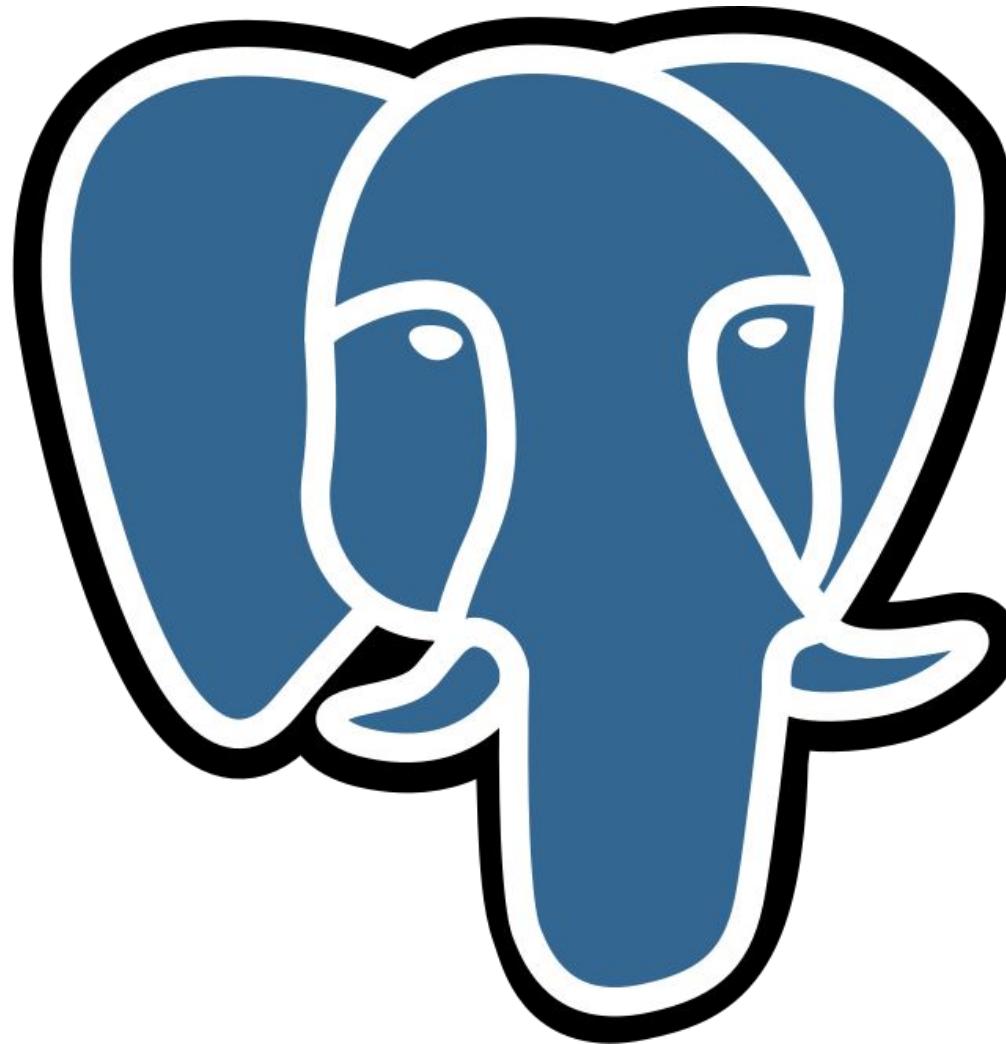


Many were
born but not all
of them
survived...

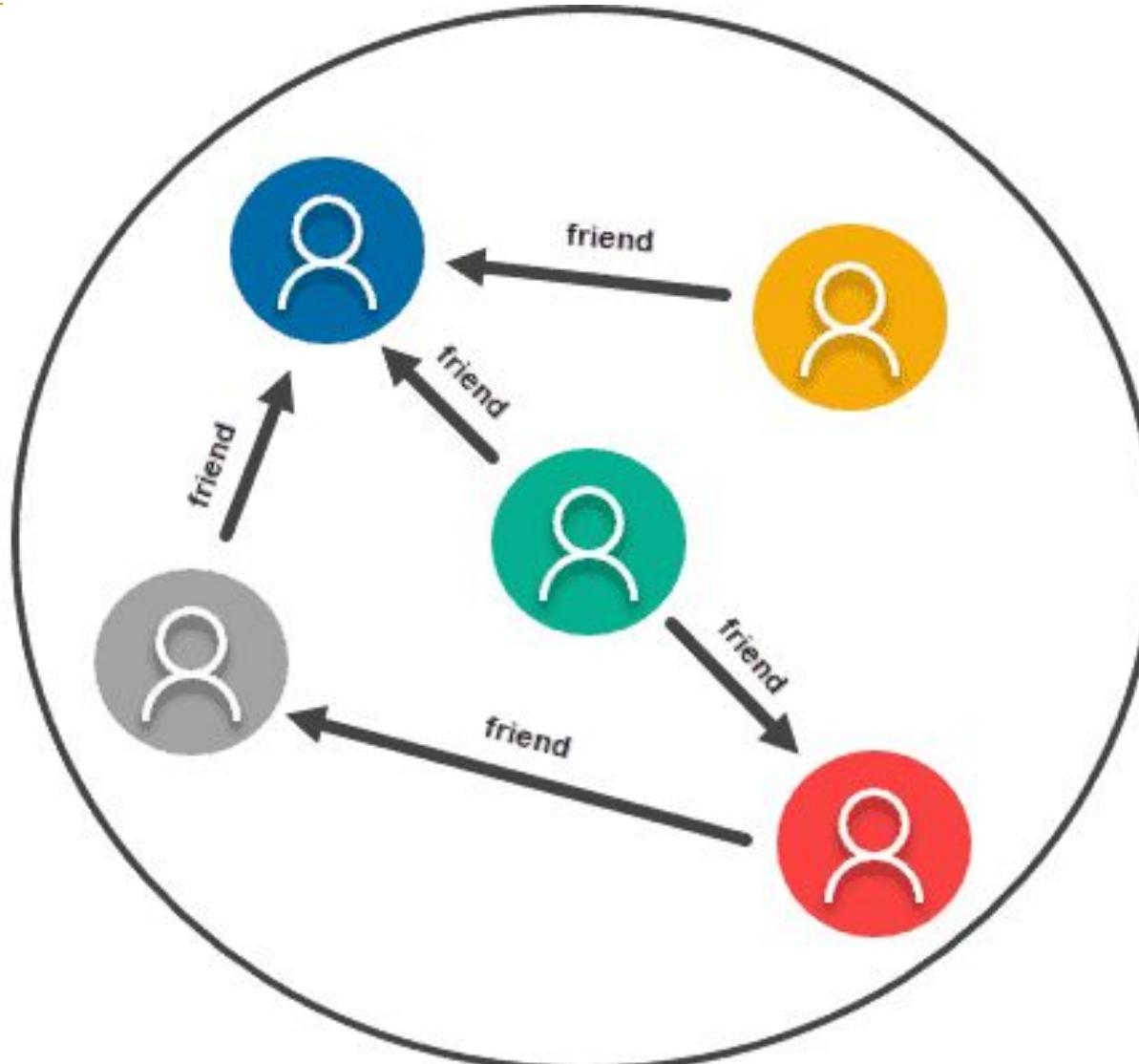


<https://tdan.com/the-rdbms-is-dead/23129>

Gladly,
Postgres
was a survivor!



Another wave,
not so long later
came bringing
this **no-SQL**
movement



<https://phoenixnap.com/kb/nosql-data-modeling>

SQL and
relational
database were
now an **old**,
ancient tech
(dead?)



<https://blog.logrocket.com/sql-isnt-a-dinosaur-and-it-s-not-dead-you-should-use-it-4e18c4fc5fb2/>

Well, seems
people found it
wasn't that
magical

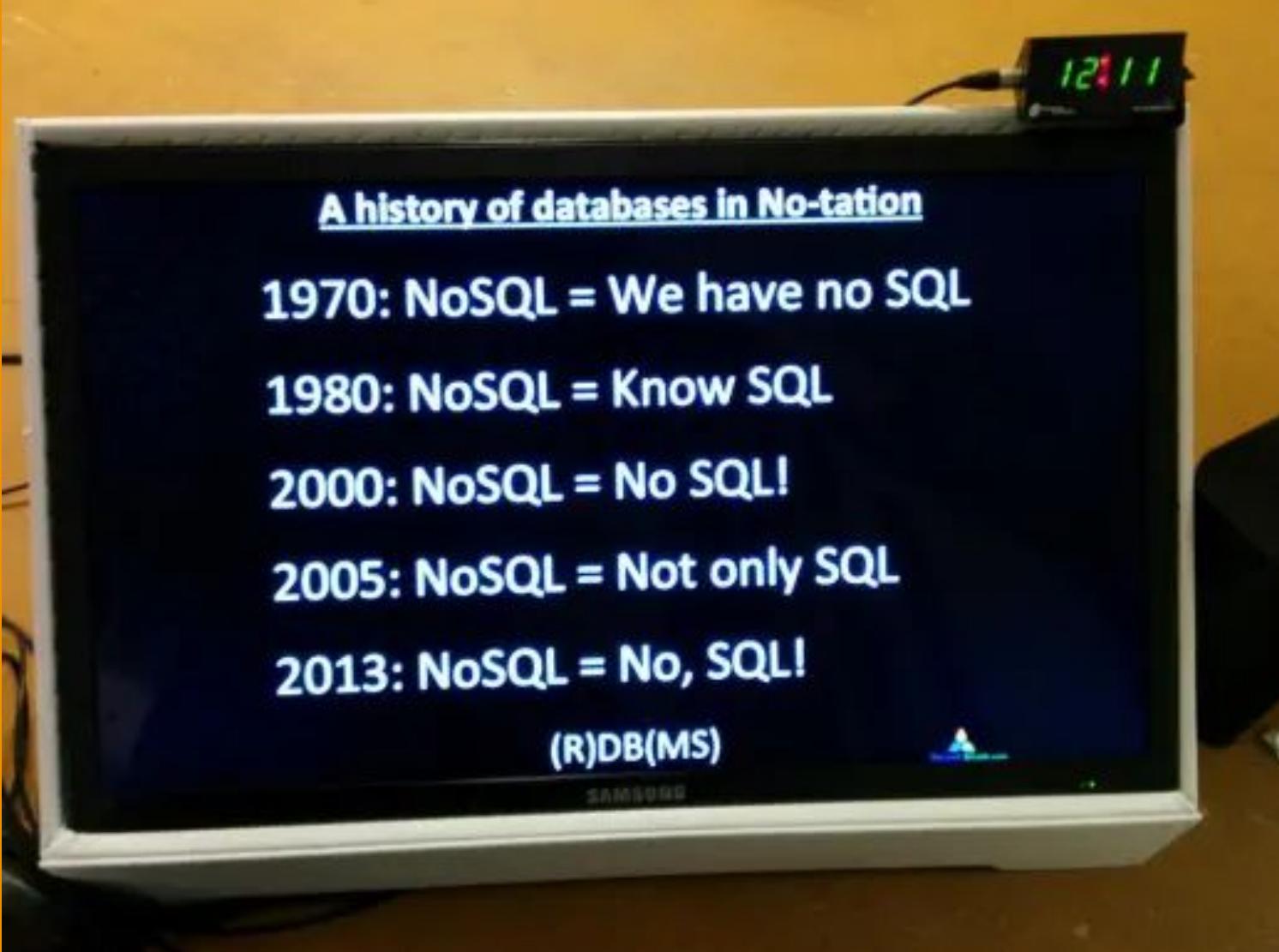
(Don't take me wrong, they all have
their space in the world)

What do you mean by comparing NoSQL with this bike?



<https://dev.to/rodiongork/how-we-killed-project-with-nosql-37af>

But the name
was awesome,
and they
changed it to
not-only-SQL
(no-SQL) 🤔



<https://blog.jooq.org/a-history-of-databases-in-no-tation/>

But it was just
the beginning...



THE BEGINNING

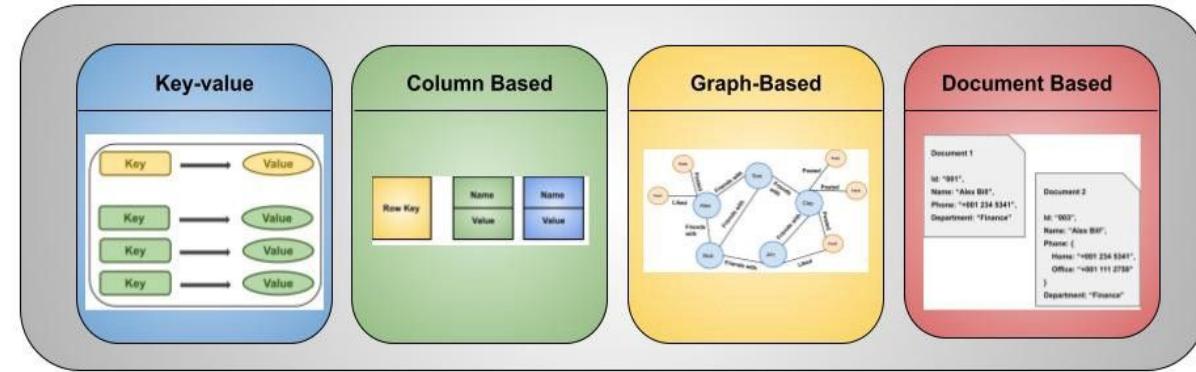
<https://wyss.harvard.edu/the-beginning/>

We were then
even more
crowded with
database
systems...

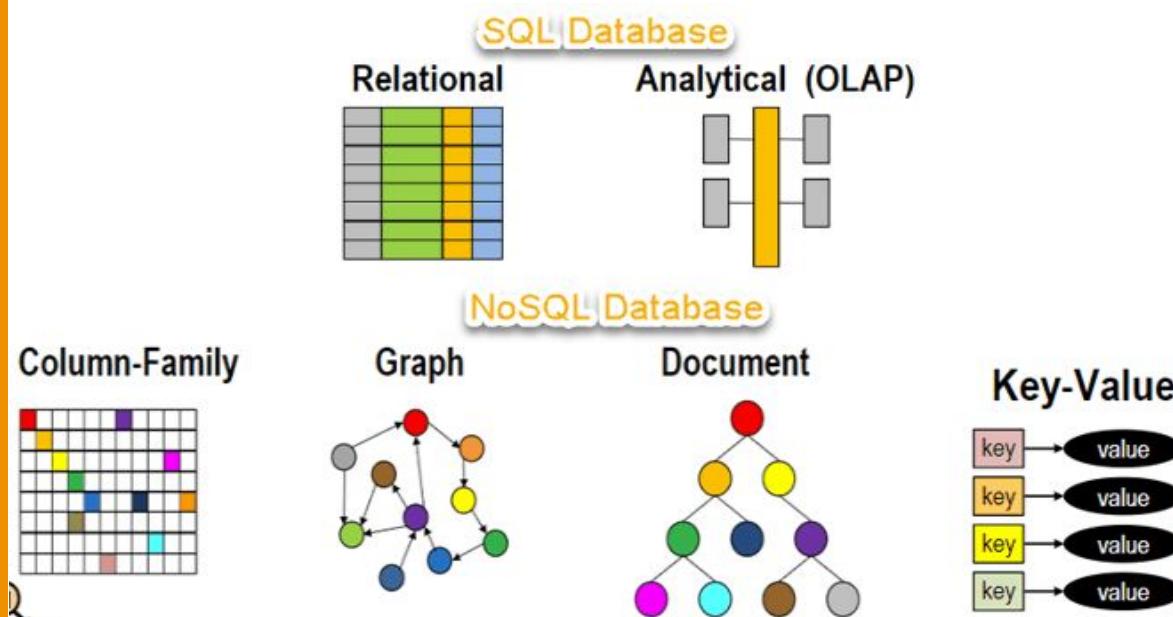


https://wordcounter.net/blog/2016/09/21/102367_tens-of-thousands.html

Time series
databases, json
databases, XML
databases,
graph.... Just
name one!

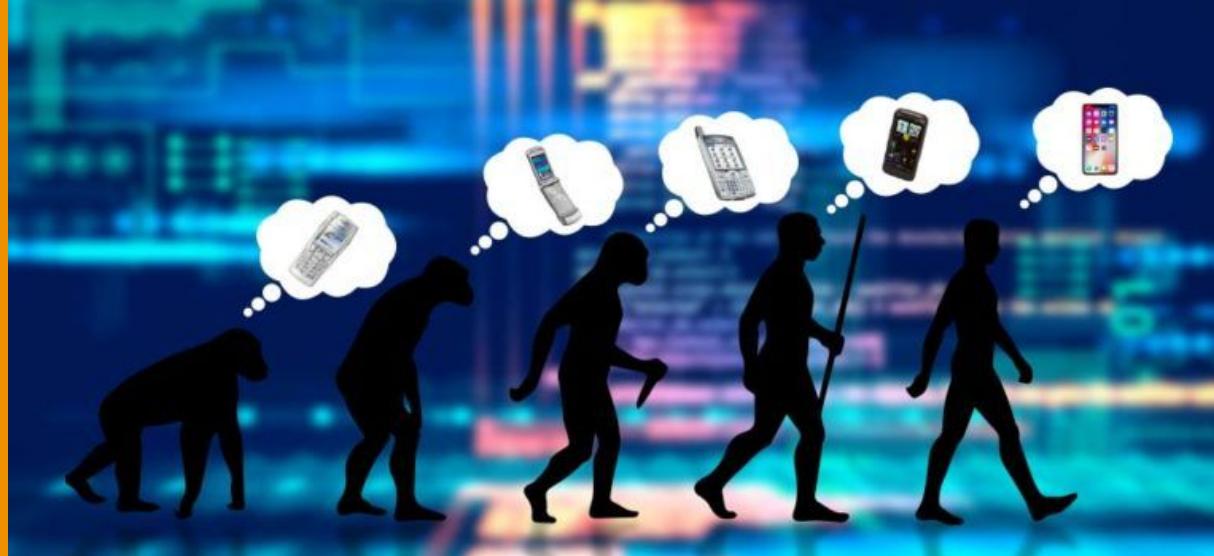


<https://ganganichamika.medium.com/deep-dive-into-nosql-database-types-80340598124>



<https://www.guru99.com/nosql-tutorial.html>

In the
meantime the
whole world
started evolving
as well



<https://thevaliantway.com/2017/11/looking-back-technology-evolution/>

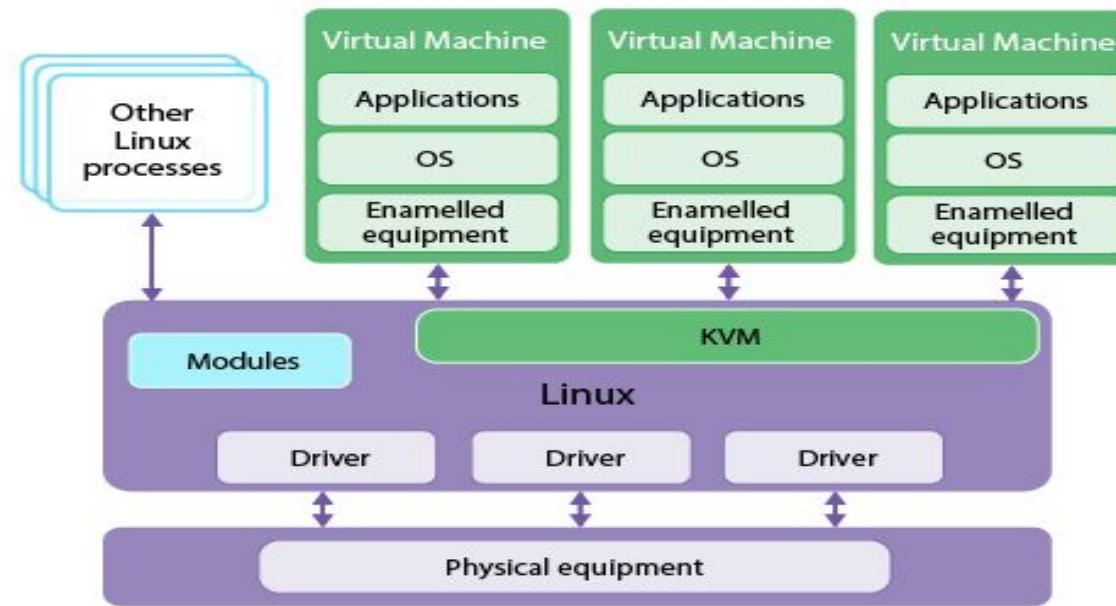


<https://notespress.com/evolution-of-computers-history/>

VMs started to
be a big thing,
and bare metal
wasn't that
great anymore



<https://www.ufsexplorer.com/articles/storage-technologies/virtual-machines-data-organization/>



<https://tuchacloud.com/hypervisor-kvm/>

**Networking
became faster,
Storage
became
faster...
Now the VMs
are the new
boss, right?**



<https://www.velocitymicro.com/blog/nvme-vs-m-2-vs-sata-whats-the-difference/>

NOPE!!!

Actually, for a
blink, yes!

But something
else made VMs
a technology
from the past...

OBSOLETE



<https://www.youtube.com/watch?v=rtzEtIWf99Q>

This is the
age of the
cloud



<https://www.mef.net/edge-view-blog/sd-wan-in-the-age-of-kubernetes-and-the-cloud-native-sd-wan-project-highlights-from-mef-3-0-poc-showcase-2021/>

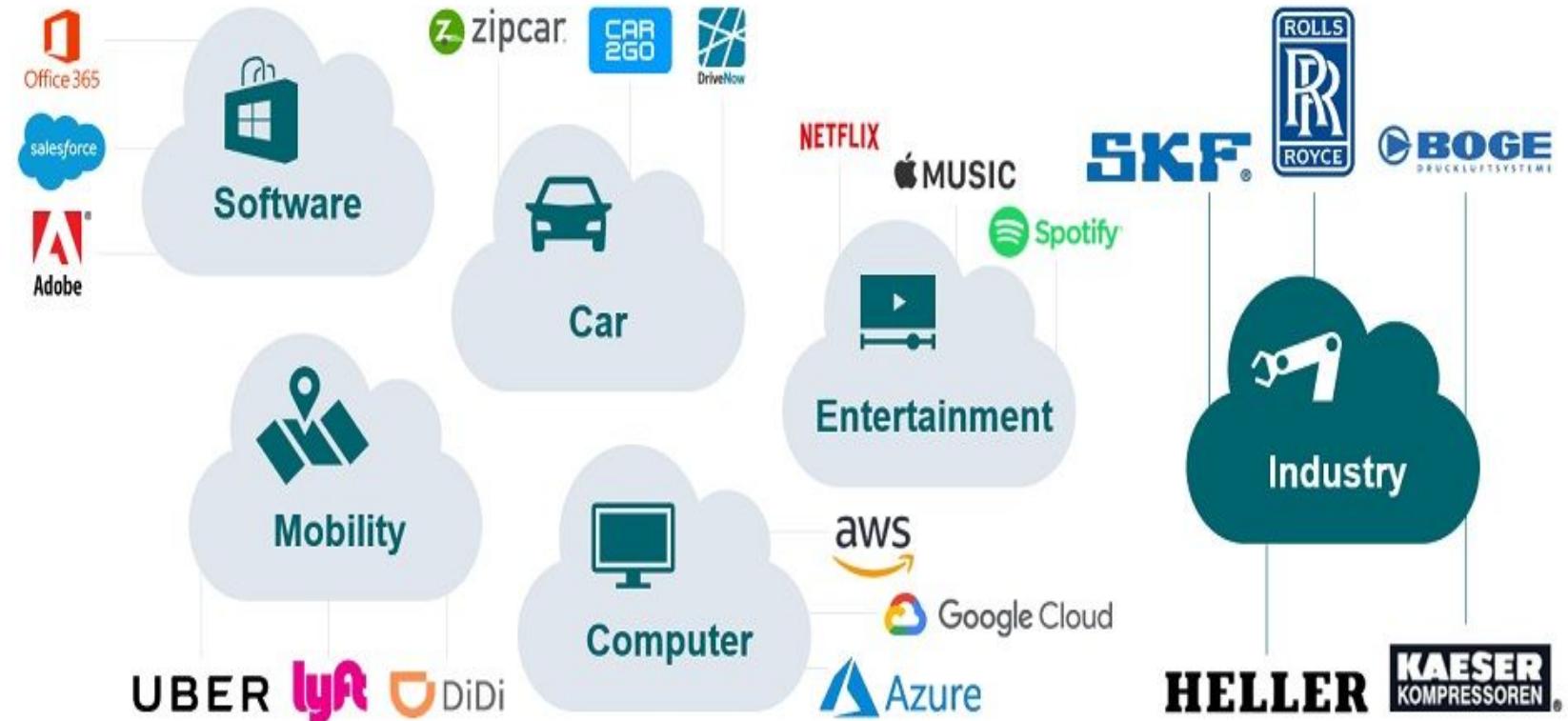
Not only
cloud, but
also
containers!



<https://www.freecodecamp.org/news/a-beginner-friendly-introduction-to-containers-vms-and-docker-79a9e3e119b/>

And then,
everything
started to be a
service

Do you recognize that XaaS is already part of your life?

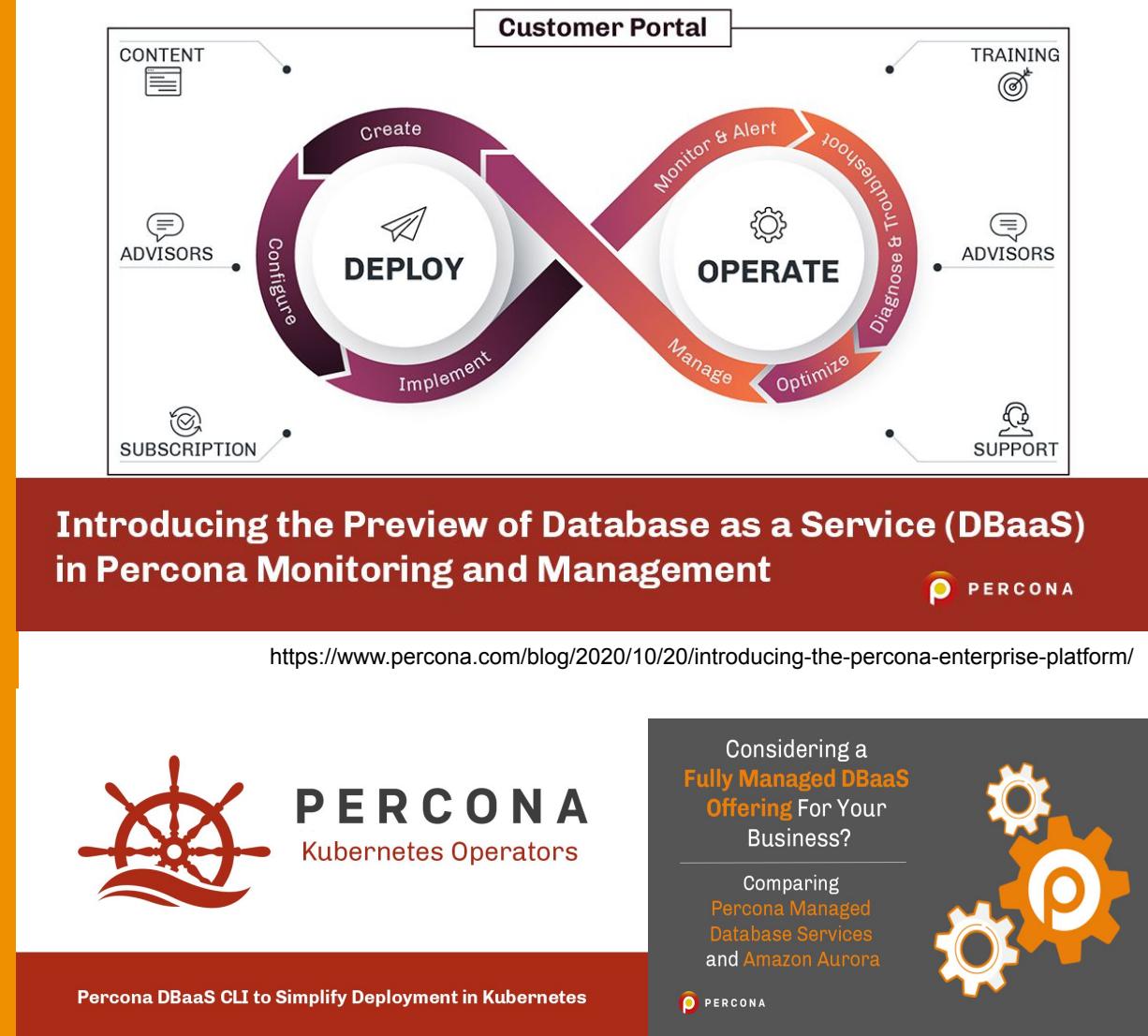


... everything as a service!

<https://blogs.sw.siemens.com/thought-leadership/2019/07/11/everything-as-a-service-a-closer-look-at-the-business-model-of-the-future/>

Well, it does
simplify life, I
have to admit!!
One can order a
database as
easy as ordering
a coffee!!!

(We are here to make it easier!)

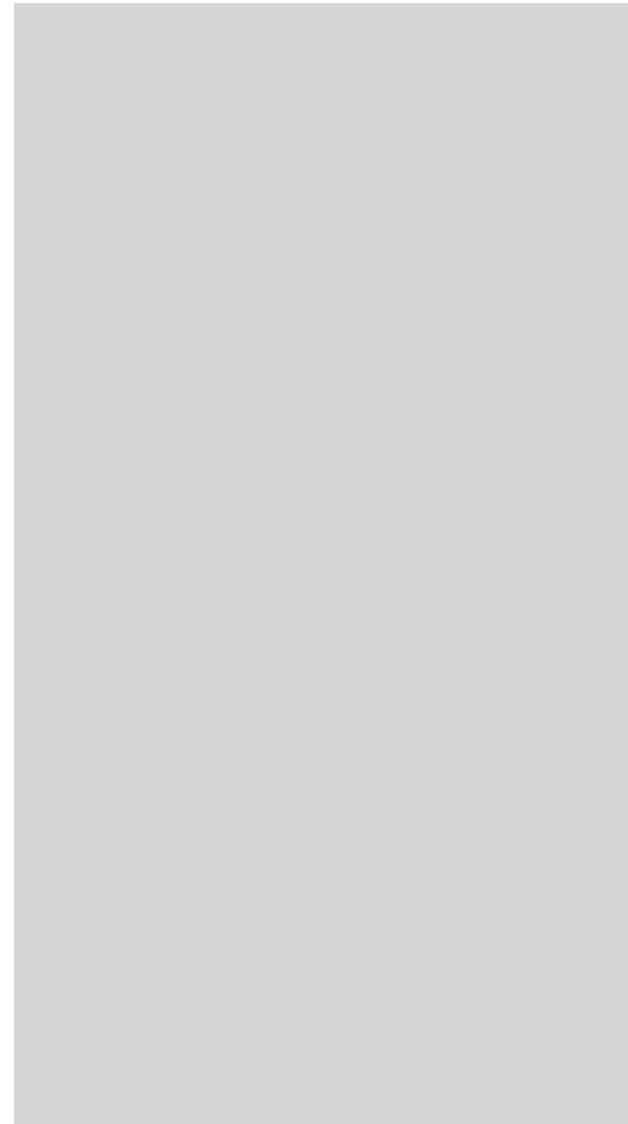
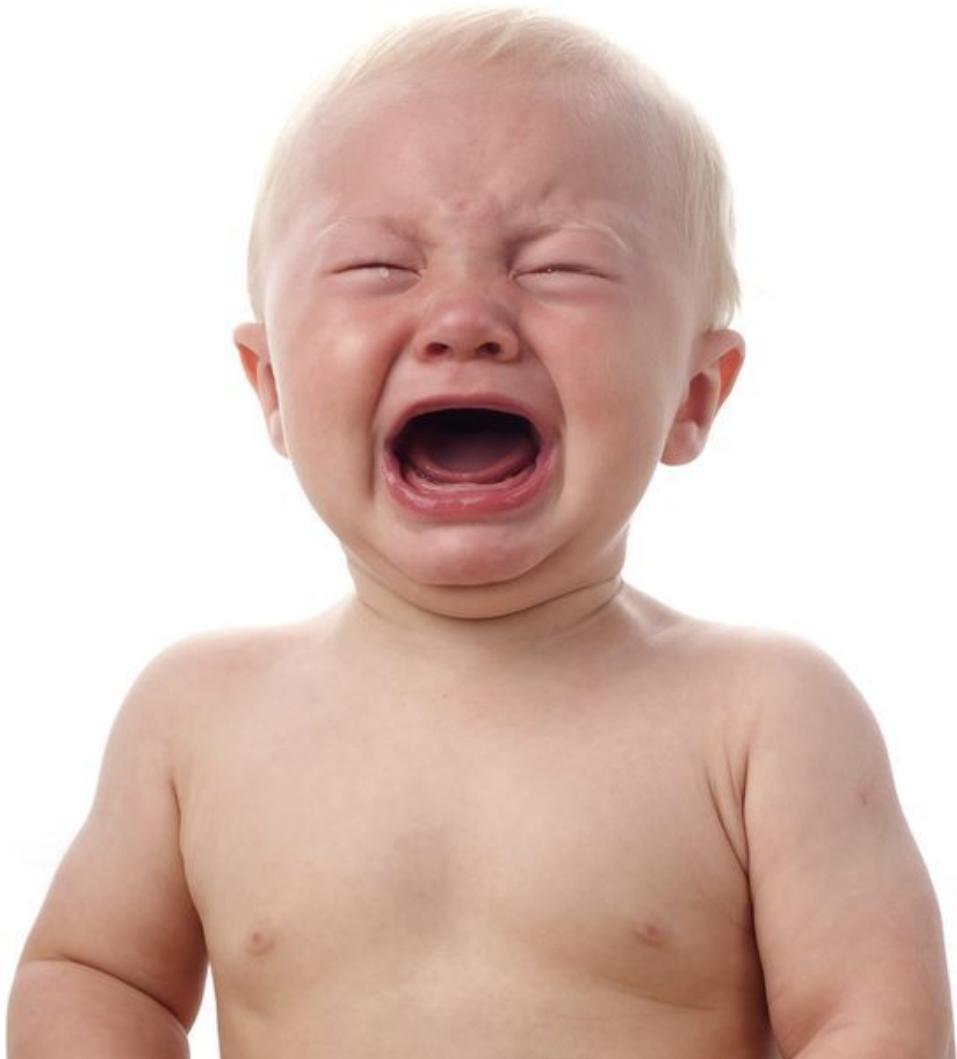


Poor DBAs,
they seem to be
an extinct
species :(



<https://oracle-base.com/blog/2022/03/22/death-of-the-dba-again/>

But wait, I am
a DBA :(



<https://www.wsj.com/articles/can-you-sleep-train-your-baby-at-2-months-1462209999>

But
I am
still
alive!!!



<https://arliewhitlow.com/how-to-get-happy/>

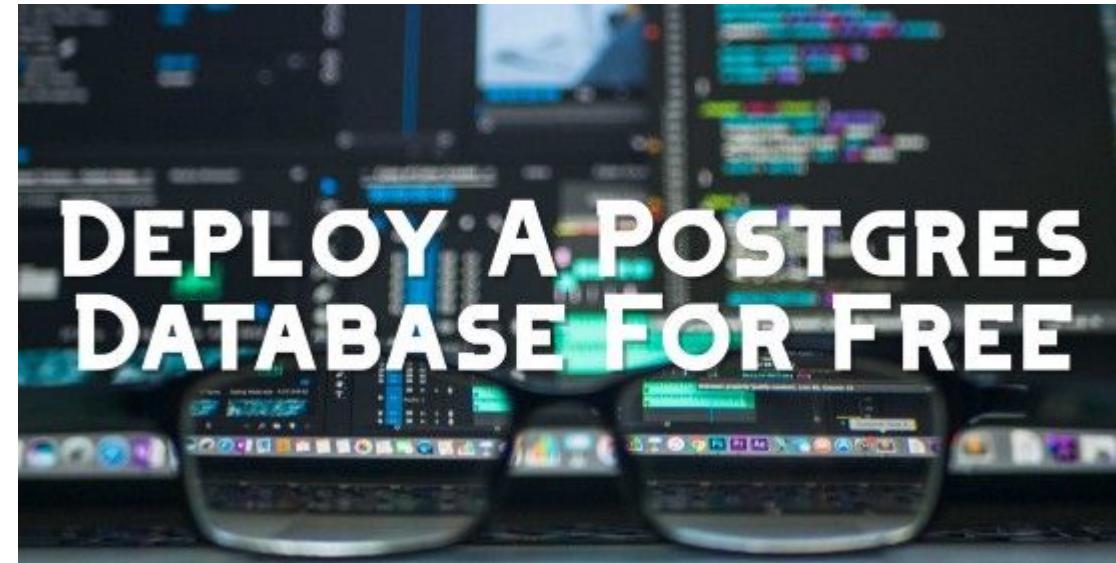
**It means, I'm
not extinct,
actually DBA's
are even more
important than
ever now!**

(Would you mind to ask me
for an example?)

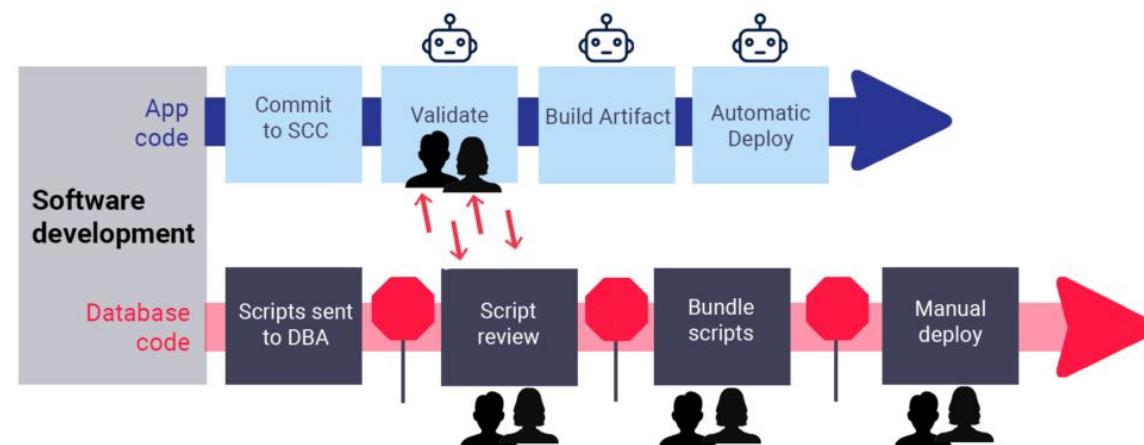


<https://lucient.com/blog/what-is-a-database-administrator-and-why-does-the-world-need-more/>

But things
changed and
now it's not
enough to only
know how to
deploy a
database



<https://towardsdatascience.com/how-to-deploy-a-postgres-database-for-free-95cf1d8387bf>

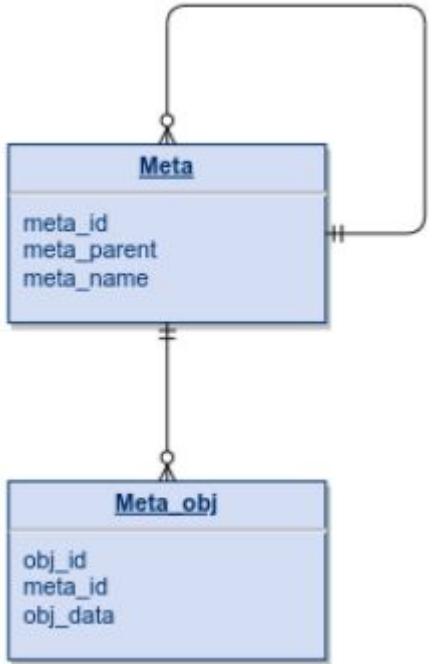


<https://www.liquibase.com/resources/guides/database-deployment>

We need to be able to adapt, move things...
For example, containers may not look like you are expecting!



Now, more than
ever make
things work
matter



meta_id	hierarchy_id	hierarchy_name	meta_name	total
1	1	Meta 1	Meta 1	0
2	2	Meta 2	Meta 2	0
3	3	Meta 3	Meta 3	0
4	2 -> 4	Meta 2 -> Meta 4	Meta 4	311905
5	3 -> 5	Meta 3 -> Meta 5	Meta 5	624842
6	1 -> 6	Meta 1 -> Meta 6	Meta 6	624651
7	1 -> 7	Meta 1 -> Meta 7	Meta 7	624651
10	2 -> 10	Meta 2 -> Meta 10	Meta 10	624633
11	3 -> 11	Meta 3 -> Meta 11	Meta 11	625547
12	1 -> 12	Meta 1 -> Meta 12	Meta 12	625121
15	1 -> 15	Meta 1 -> Meta 15	Meta 15	623943
8	2 -> 4 -> 8	Meta 2 -> Meta 4 -> Meta 8	Meta 8	625679
9	1 -> 7 -> 9	Meta 1 -> Meta 7 -> Meta 9	Meta 9	627206
13	2 -> 10 -> 13	Meta 2 -> Meta 10 -> Meta 13	Meta 13	623700
14	2 -> 4 -> 14	Meta 2 -> Meta 4 -> Meta 14	Meta 14	625594
16	3 -> 5 -> 16	Meta 3 -> Meta 5 -> Meta 16	Meta 16	625152
17	1 -> 12 -> 17	Meta 1 -> Meta 12 -> Meta 17	Meta 17	626042
18	2 -> 4 -> 18	Meta 2 -> Meta 4 -> Meta 18	Meta 18	624726
19	2 -> 10 -> 19	Meta 2 -> Meta 10 -> Meta 19	Meta 19	624431
20	1 -> 7 -> 20	Meta 1 -> Meta 7 -> Meta 20	Meta 20	312177

(20 rows)

Time: 26555.986 ms (00:26.556)

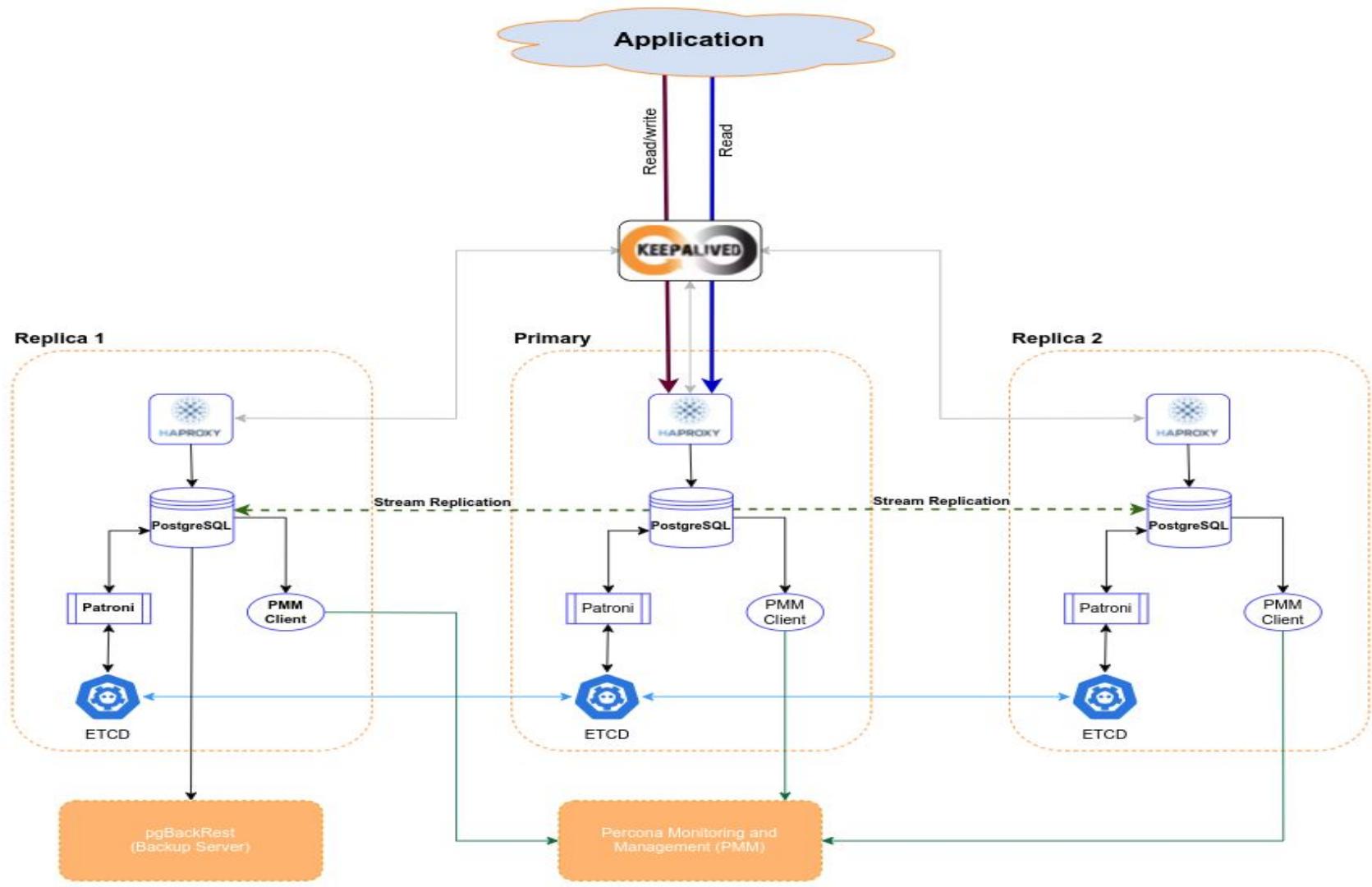
Now, more than
ever make
things work
faster
matter even
more!

meta_id	hierarchy_id	hierarchy_name	meta_name	total
1	1	Meta 1	Meta 1	0
2	2	Meta 2	Meta 2	0
3	3	Meta 3	Meta 3	0
4	2 -> 4	Meta 2 -> Meta 4	Meta 4	311905
5	3 -> 5	Meta 3 -> Meta 5	Meta 5	624842
6	1 -> 6	Meta 1 -> Meta 6	Meta 6	624651
7	1 -> 7	Meta 1 -> Meta 7	Meta 7	624651
10	2 -> 10	Meta 2 -> Meta 10	Meta 10	624633
11	3 -> 11	Meta 3 -> Meta 11	Meta 11	625547
12	1 -> 12	Meta 1 -> Meta 12	Meta 12	625121
15	1 -> 15	Meta 1 -> Meta 15	Meta 15	623943
8	2 -> 4 -> 8	Meta 2 -> Meta 4 -> Meta 8	Meta 8	625679
9	1 -> 7 -> 9	Meta 1 -> Meta 7 -> Meta 9	Meta 9	627206
13	2 -> 10 -> 13	Meta 2 -> Meta 10 -> Meta 13	Meta 13	623700
14	2 -> 4 -> 14	Meta 2 -> Meta 4 -> Meta 14	Meta 14	625594
16	3 -> 5 -> 16	Meta 3 -> Meta 5 -> Meta 16	Meta 16	625152
17	1 -> 12 -> 17	Meta 1 -> Meta 12 -> Meta 17	Meta 17	626042
18	2 -> 4 -> 18	Meta 2 -> Meta 4 -> Meta 18	Meta 18	624726
19	2 -> 10 -> 19	Meta 2 -> Meta 10 -> Meta 19	Meta 19	624431
20	1 -> 7 -> 20	Meta 1 -> Meta 7 -> Meta 20	Meta 20	312177

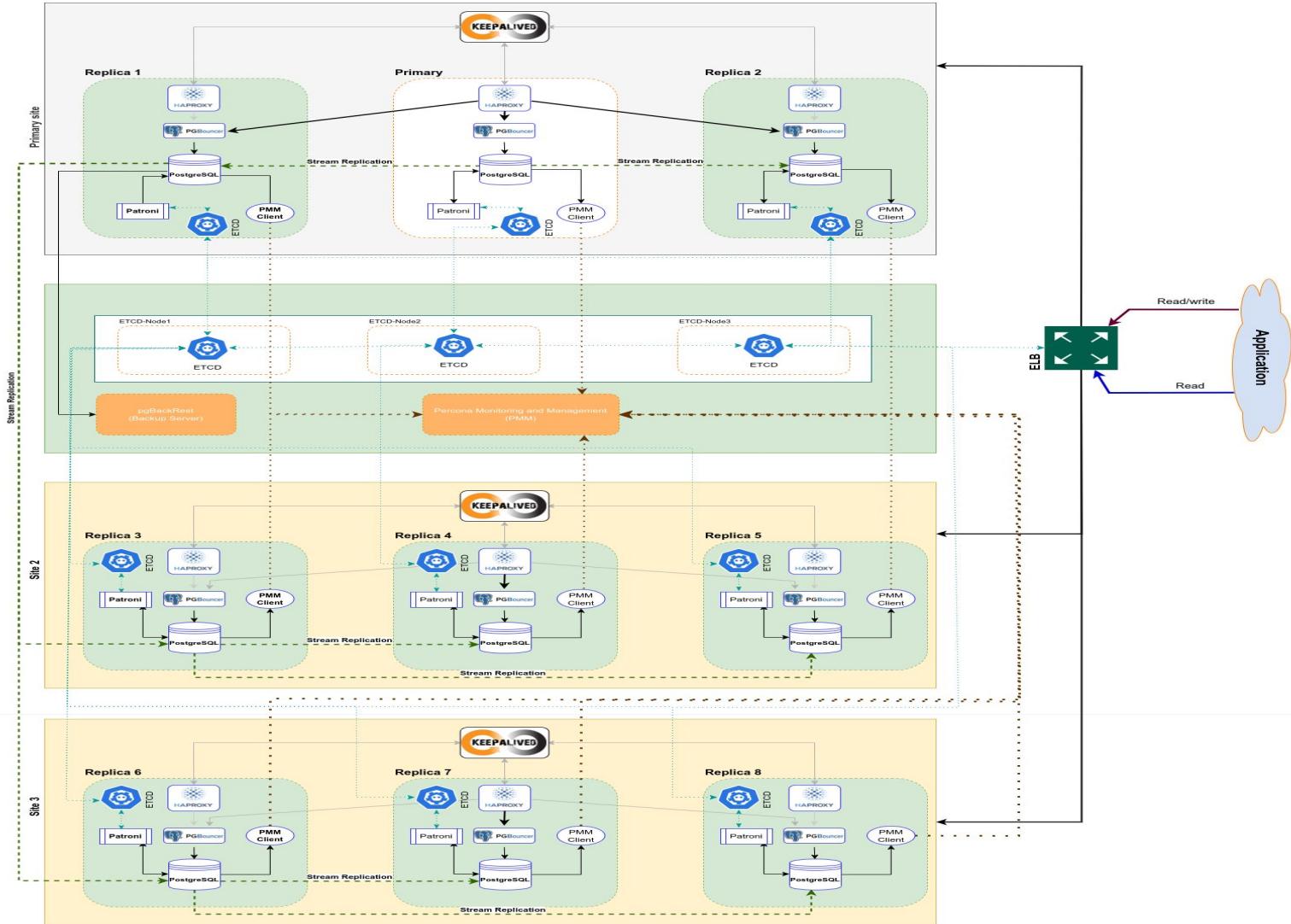
(20 rows)

Time: 2333.546 ms (00:02.334)

Now, more than
ever make
things **work**
matter



Now, more than ever make things work on scale matter even more!



Maybe do
migrations...



<https://www.youtube.com/watch?v=iwzc6sDqfX8>

... move
from one
database
system to
another...



PERCONA TECH DAYS

MIGRATING FROM MSSQL TO PostgreSQL

Robert Bernier
Consultant in Professional Services

<https://www.youtube.com/watch?v=iwzc6sDqfX8>

From one
version to
another...



Migrating to PostgreSQL Version 13: Incompatibilities You Should Be Aware Of

<https://www.percona.com/blog/2020/07/28/migrating-to-postgresql-version-13-incompatibilities-you-should-be-aware-of/>

From one
application
to another...

Community PostgreSQL Live Stream & Chat

Migrating PostgreSQL to a New Server

Bi-Weekly Live Stream

Thursday, June 30th
12:00 PM EDT
06:00 PM CEST
09:30 PM IST

with the **Dave and Chino**

It means that
we need to be
able to
understand
a bit how this
meteorological
cloud thing
works



<https://www.percona.com/blog/cloud-native-series-1>

CLOUD-NATIVE THROUGH THE PRISM OF PERCONA: EPISODE 1



Because we
need to keep it
sunny, shiny, a
healthy
database,
not a
hurricane of
issues

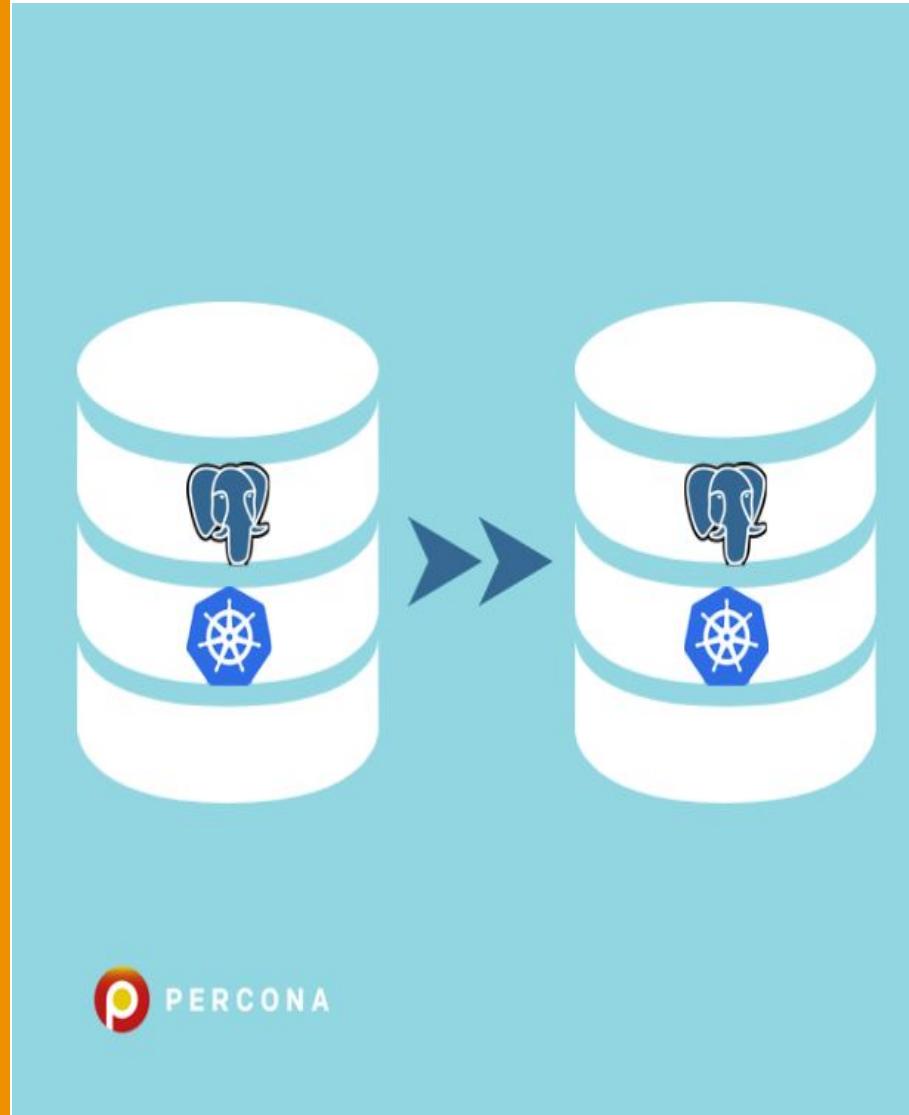
Percona and PostgreSQL *Better Together*

Learn Why Customers
Choose Percona



<https://www.percona.com/blog/percona-and-postgresql-better-together/>

We also need to
have some
understanding
of this container
logistics



<https://www.percona.com/blog/creating-a-standby-cluster-with-the-percona-distribution-for-postgresql-operator/>

CREATING A STANDBY CLUSTER WITH THE **PERCONA** **DISTRIBUTION** **FOR POSTGRESQL** **OPERATOR**

We want
NO disruptions,
NO shortages...
Keep the supply
chain healthy!

WEBINAR

How to Improve PostgreSQL Monitoring and Observability with PMM

Tuesday, March 29th - 10am PT / 1pm ET

REGISTER NOW



Charly Batista



Agustin Gallego

We also need
to, sometimes,
dig into some
other domains,
like...

POSTGRESQL PL/JAVA A HOW-TO

PART ONE

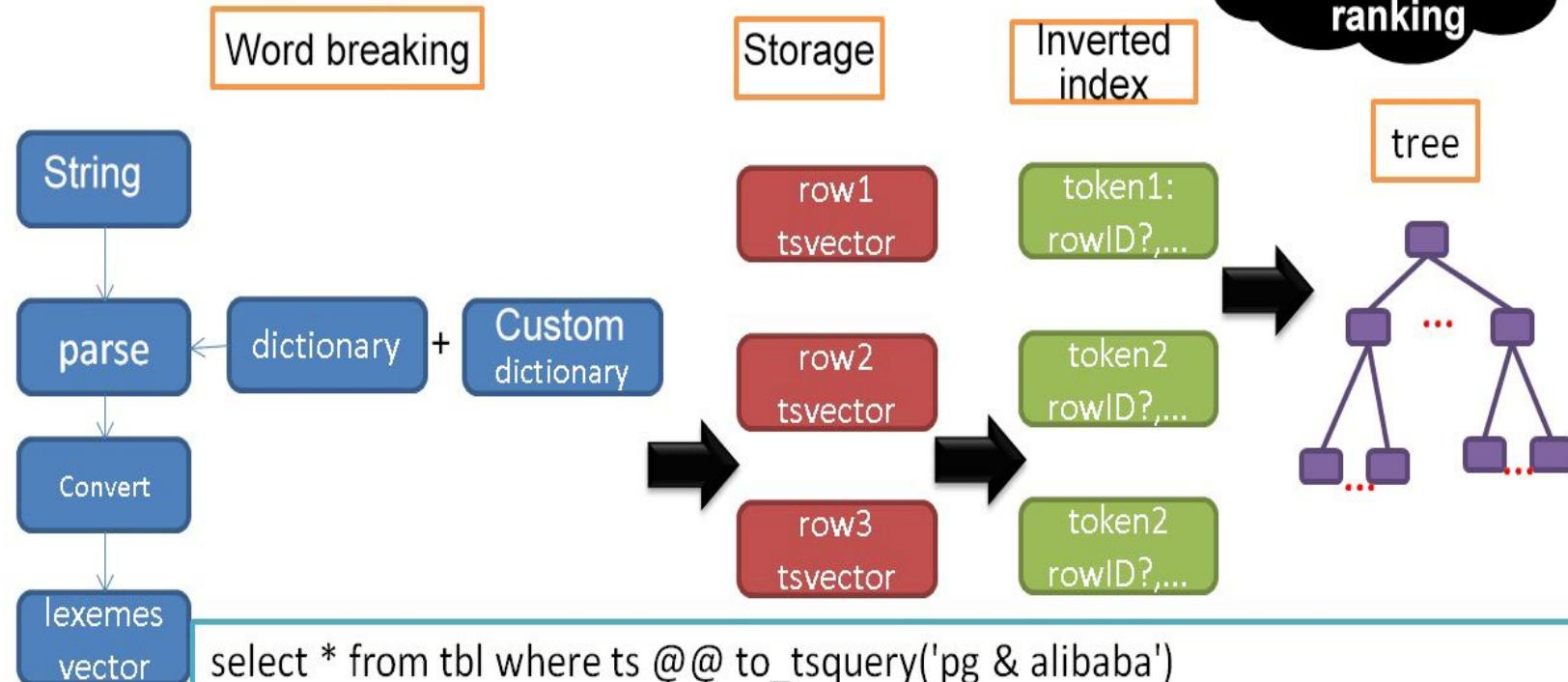
<https://www.percona.com/blog/postgresql-pl-java-how-to-part-1/>



Fulltext search

Full-text searching

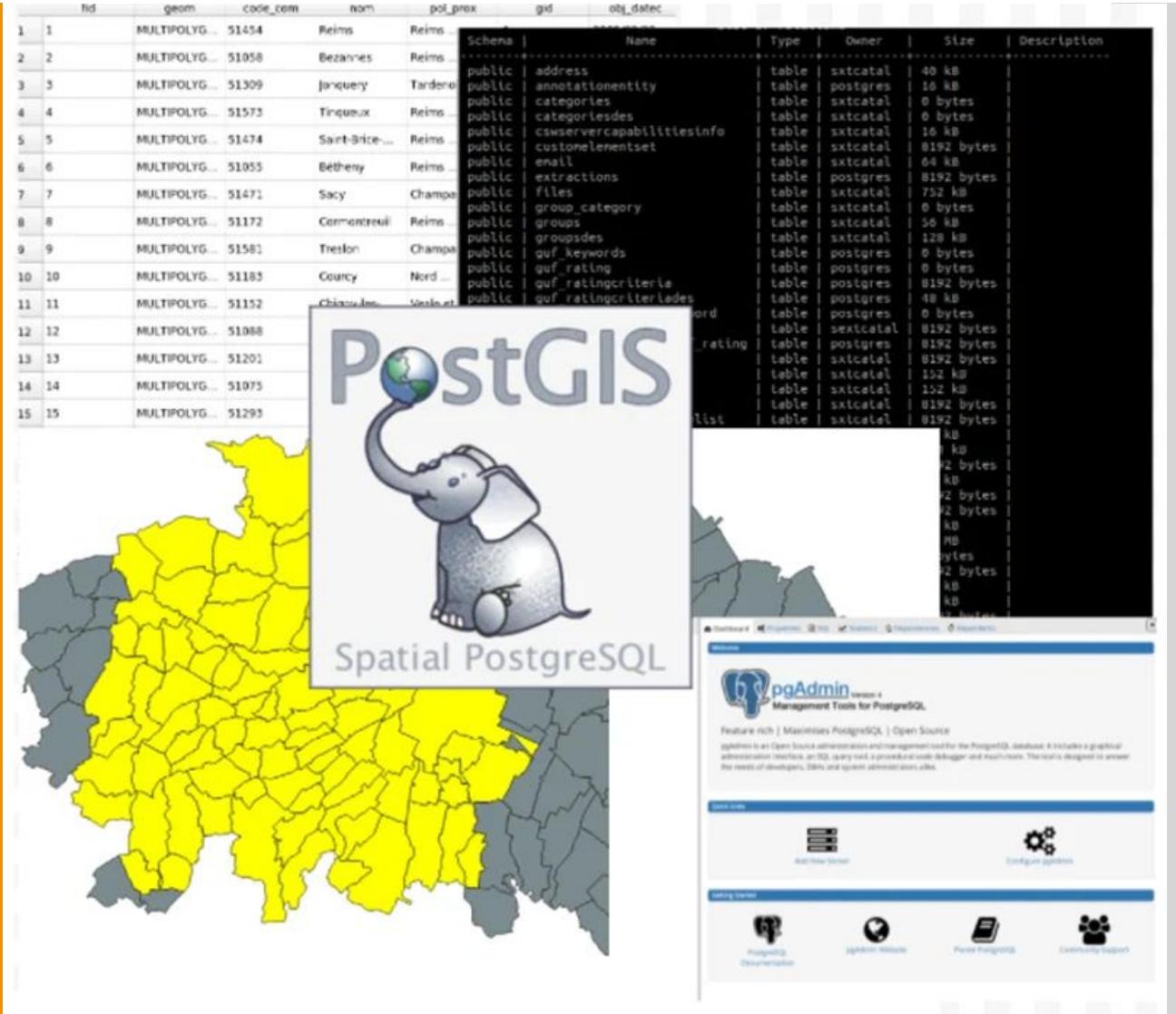
Support for
fine-grained ranking
and fine-tuning
ranking



```
select * from tbl where ts @@ to_tsquery('pg & alibaba')
order by ts_rank(ts, to_tsquery('pg & alibaba'));
-- order by ts_rank_cd(ts, to_tsquery('pg & alibaba'))
https://www.postgresql.org/docs/10/static/textsearch-controls.html#TEXTSEARCH-RANKING
```

<https://hevodata.com/blog/postgresql-full-text-search-setup/>

Geographic Information System (Post)GIS



<https://www.campocamp.com/postgresql>

Medicine

Biology

Genetics

Farmaceutics

[Journal List](#) > [Database \(Oxford\)](#) > [v.2021; 2021](#) > PMC8363843



[Database \(Oxford\) 2021; 2021: baab051.](#)

Published online 2021 Aug 14. doi: [10.1093/database/baab051](https://doi.org/10.1093/database/baab051)

PMCID: PMC8363843

PMID: [34389844](#)

A PostgreSQL Tripal solution for large-scale genotypic and phenotypic data



PostBIS A Bioinformatics Booster for PostgreSQL

> [J Healthc Eng. 2015;6\(3\):325-44. doi: 10.1260/2040-2295.6.3.325.](#)

An Electronic Healthcare Record Server Implemented in PostgreSQL

Tony Austin, Shanghua Sun, Yin Su Lim, David Nguyen, Nathan Lea, Archana Tapuria, Dipak Kalra

PMID: 26753438 DOI: [10.1260/2040-2295.6.3.325](https://doi.org/10.1260/2040-2295.6.3.325)

[Free article](#)

https://wiki.postgresql.org/images/1/1b/Postbis_pgcon_eu_2012.pdf

<https://pubmed.ncbi.nlm.nih.gov/26753438/>

Applied Science

- Physics

- Math

- Chemistry

- ...

Evaluating Query Languages and Systems for High-Energy Physics Data

[Extended Version]

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Mason Proffitt

Department of Physics

University of Washington

masonLp@uw.edu

<https://arxiv.org/pdf/2104.12615.pdf>

PostgreSQL Chemical Analysis Module: RDKit Cartridge 1 for Environment Deployment

digoal

May 2, 2021

2,887

0

In this article, we introduce the RDKit toolset for managing and analyzing large sets of chemical data and explain how PostgreSQL acts as the molecular database in this toolset.

PostgreSQL Chemical Analysis Module: RDKit Cartridge 1 for Environment Deployment

digoal

May 2, 2021

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0

In this article, we introduce the RDKit toolset for managing and analyzing large sets of chemical data and explain how PostgreSQL acts as the molecular database in this toolset.

https://www.alibabacloud.com/blog/postgresql-chemical-analysis-module-rdkit-cartridge-1-for-environment-deployment_597703

<https://jcheminf.biomedcentral.com/articles/10.1186/1758-2946-5-48>

Machine Learning

PostgresML

Simple machine learning with PostgreSQL

circleci passing downloads 331/month pypl v1.0.1 chat 4 online

Train and deploy models to make online predictions using only SQL, with an open source extension for Postgres.

Manage your projects and visualize datasets using the built in dashboard.

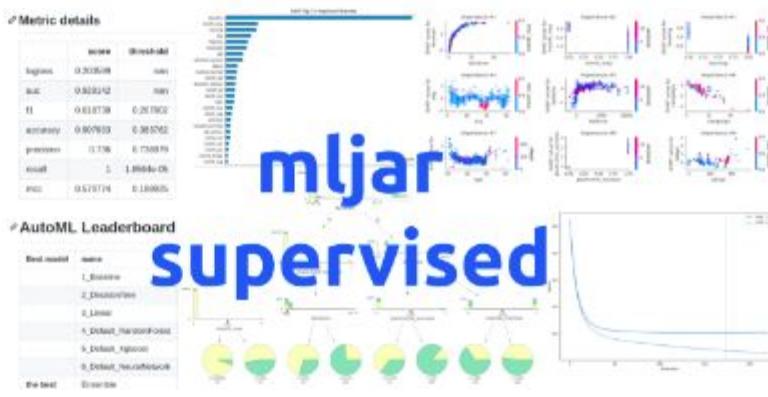
<https://github.com/postgresml/postgresml>

PostgreSQL and Machine Learning

September 16, 2020 by Piotr Płotnicki Postgresql AutoML Supervised



PostgreSQL

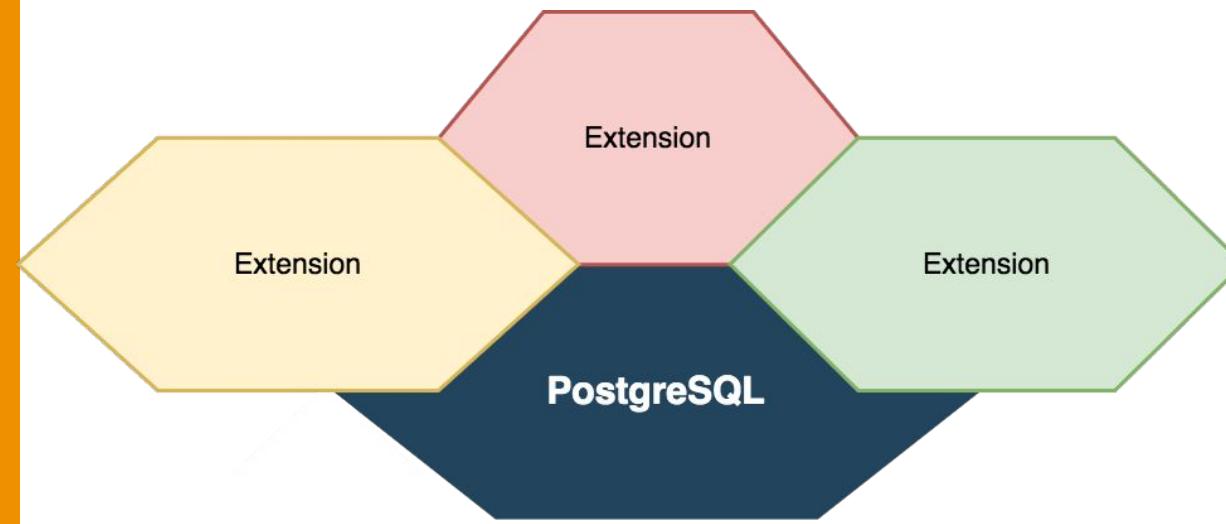


<https://mljar.com/blog/postgresql-machine-learning/>

And a lot more!

Postgres

is highly
extensible



<https://www.highgo.ca/2019/07/22/how-to-add-extensions-to-pg-on-ubuntu/>

Summary is the
DBA
species isn't at
extinction, it's
even more
needed
nowadays!
(Want to ask me an example?)

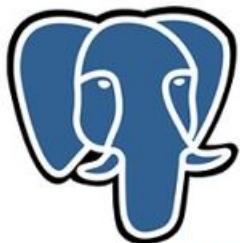


<https://www.webopedia.com/definitions/database-administrator-dba/>

Does
Postgres
make the DBA's
life easier?
It seems to be
everywhere,
into everything!



PERCONA
PMM Server



Postgre**SQL**



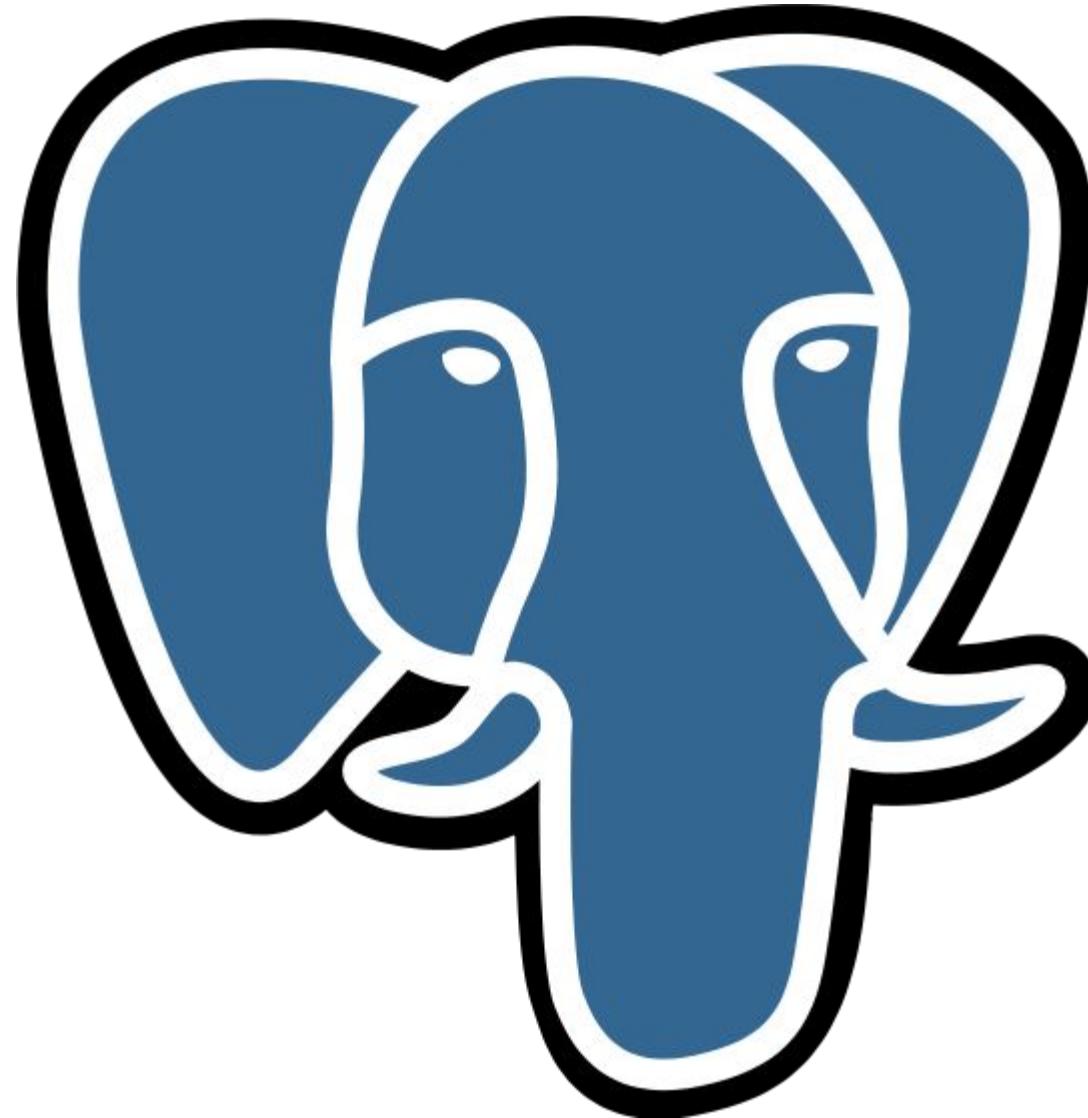
PGBouncer



HAProxy

It definitely
does...

Postgres
is very
robust,
powerful,
extensible,
etc...



Bue even if it
doesn't make
the DBA life
the easiest in
the world, it for
sure make it
one of the most
exciting...



And proud!

Community PostgreSQL Live Stream & Chat

Thursday, August 11th at 12:00 PM EDT /06:00 PM CEST /09:30 PM IST

PostgreSQL Running
on Kubernetes Operations

Bi-Weekly Live Stream

with Chino and Dave

PERCONA

ECUADOR PERCONA ADVENTURE

Open source database better

Team

PERCONA

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In conclusion,
Postgres is
amazing...

The DBA may
not have the
easiest life, but
we at Percona
are here to help!

We at Percona are also proud to be part of this ecosystem, this amazing story written by Open Source.

We are not only a Postgre company, we are Open Source. We have a distribution for MySQL, MongoDB, monitoring with PMM, and a lot more...

Want to learn more about us? You can find me after this presentation.

Questions?

Any question?

You can find me on LinkedIn at <https://www.linkedin.com/in/charlybatista>

Or drop me an email at charly.batista@percona.com

Thank You!