



Hanoi, Vietnam 2024

**PERCONA
UNIVERSITY**

Open Source Databases Meetup

In partnership with



Welcome



Peter Zaitsev,
Founder at Percona
November 2, 2024

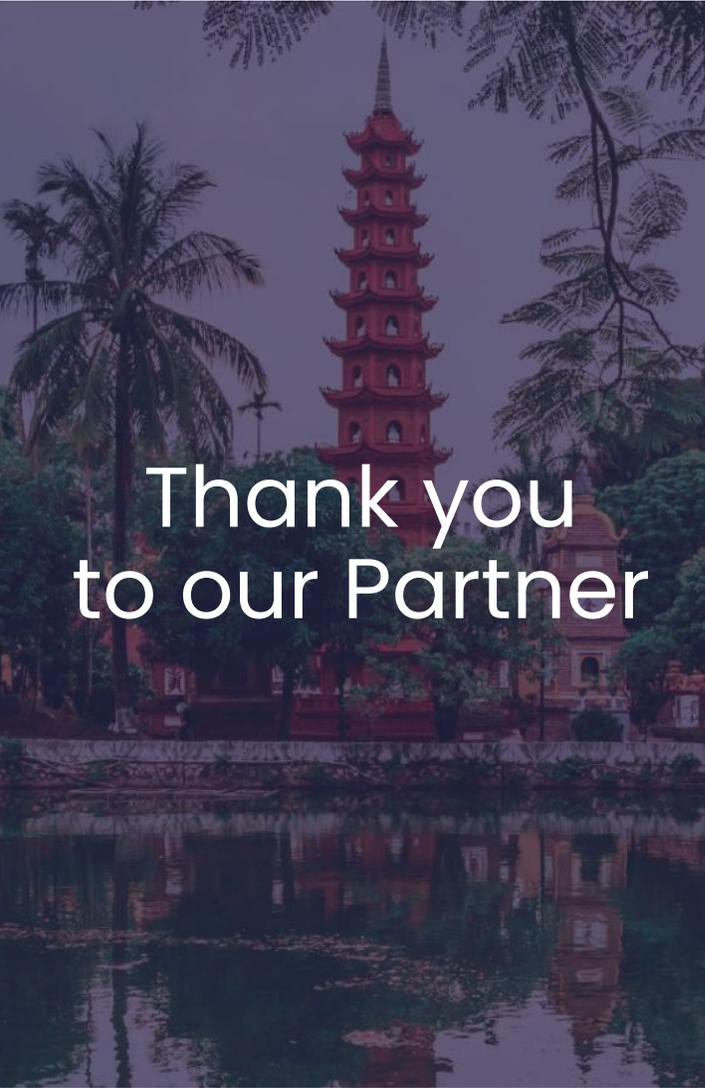
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Thank you
to our Partner



Hanoi, Vietnam 2024

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Open Source Databases Meetup

Sameer Kumar

Your friendly
Percona Sales Person

sameer.kumar@percona.com

LinkedIn: -sameer-kumar-



Bring Percona University to Your City!



WE ARE HIRING

We are **hiring**.
Check our openings.



Current openings include:

- Senior Software Engineer (PostgreSQL)
- Support Engineer (PostgreSQL)
- PostgreSQL Evangelist
- ...and more!



State of Open Source Databases



Hanoi, Vietnam 2024

**PERCONA
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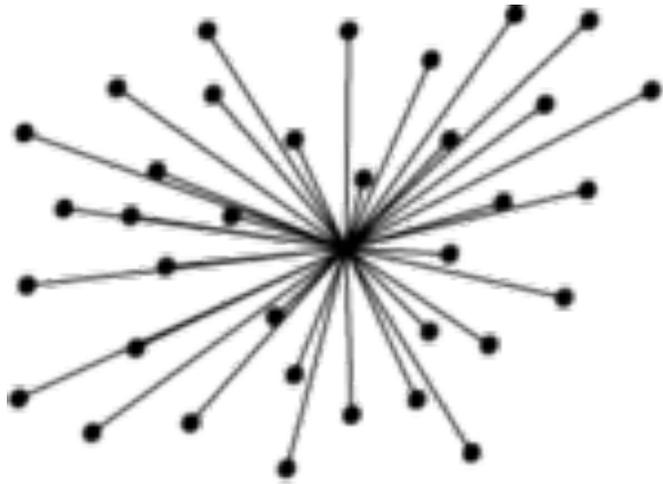
Open Source Databases Meetup

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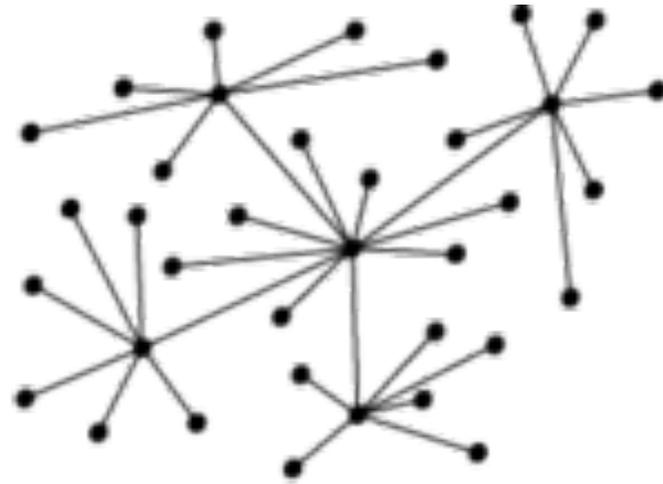


A glowing lightbulb is the central focus, set against a background of a sunset or sunrise. The lightbulb is illuminated from within, casting a warm glow. The background shows a gradient of colors from dark blue at the bottom to orange and yellow at the top. The word "Innovation" is written in a large, white, sans-serif font across the middle of the image. On the left side, there is a vertical orange bar, and on the right side, there is a vertical grey bar.

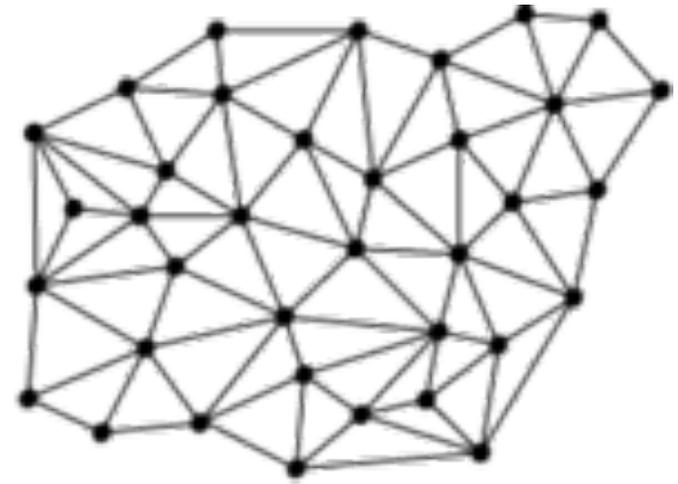
Innovation



centralised



decentralised



distributed

Distributed Databases

A photograph of a server rack in a data center. The server units are dark with some blue and yellow lights. The background is heavily blurred, showing out-of-focus lights in shades of blue, yellow, and green, creating a bokeh effect. A dark semi-transparent box is overlaid on the left side of the image, containing white text.

Separation of Storage and Compute

Serverless



A pink unicorn with large, translucent wings and a blonde fairy riding it on a beach. The unicorn has a yellow and red mane, a blue and white patterned body, and a pink saddle with flowers. The fairy has blonde hair, a gold crown, and a green and white dress. They are on a sandy beach with waves in the background.

HTAP – Hybrid Transactional Analytical Processing



Data Pipelines

Multiple Databases

Microservices

Developers Authority

Cloud



**Not just Relational
Any More**



Time Series



Graph



Data Structures

Different Models



Multi-Model

Some Databases Support Multiple Data Models, Some even Talk Different Languages/Protocols



Vector Search

Technology Supporting building applications which use AI



AI Algorithms do not work with words and Images inside



They work with Vectors



Objects encoded to Vector form called "Embeddings"



Finding Similar Vectors is a key task



Traditional Database Algorithms do not handle it well

What's Up with Vectors

<https://manticoresearch.com/blog/vector-search-in-databases/>

Specific Tasks



Pattern Recognition



Semantic Search



RAG – “Retrieval Augmented
Generation”

Vector search support in databases

Opensource vector dbs

Milvus	2019
Vespa	2020
Weaviate	2021
Qdrant	2022

Opensource dbs and search engines

PostgreSQL	2021
Lucene	2021
Opensearch	2022
Redis	2022
SOLR	2022
Cassandra	2023
Typesense	2023
Clickhouse	2023
Manticore Search	2023
Meilisearch	2023
MariaDB	In progress
MySQL	Not yet

Non-open source dbs

Elasticsearch	2019
Oracle	2023
MongoDB	2023

Clouds

Pinecone	2019
Amazon Elasticsearch / Opensearch	2020
Google Cloud Platform	2021
Alibaba Cloud AnalyticDB	2023
Azure	2023
Amazon DocumentDB	2023
Cloudflare Vectorize	2023

What Is the Biggest Factor Impacting Open Source Now?

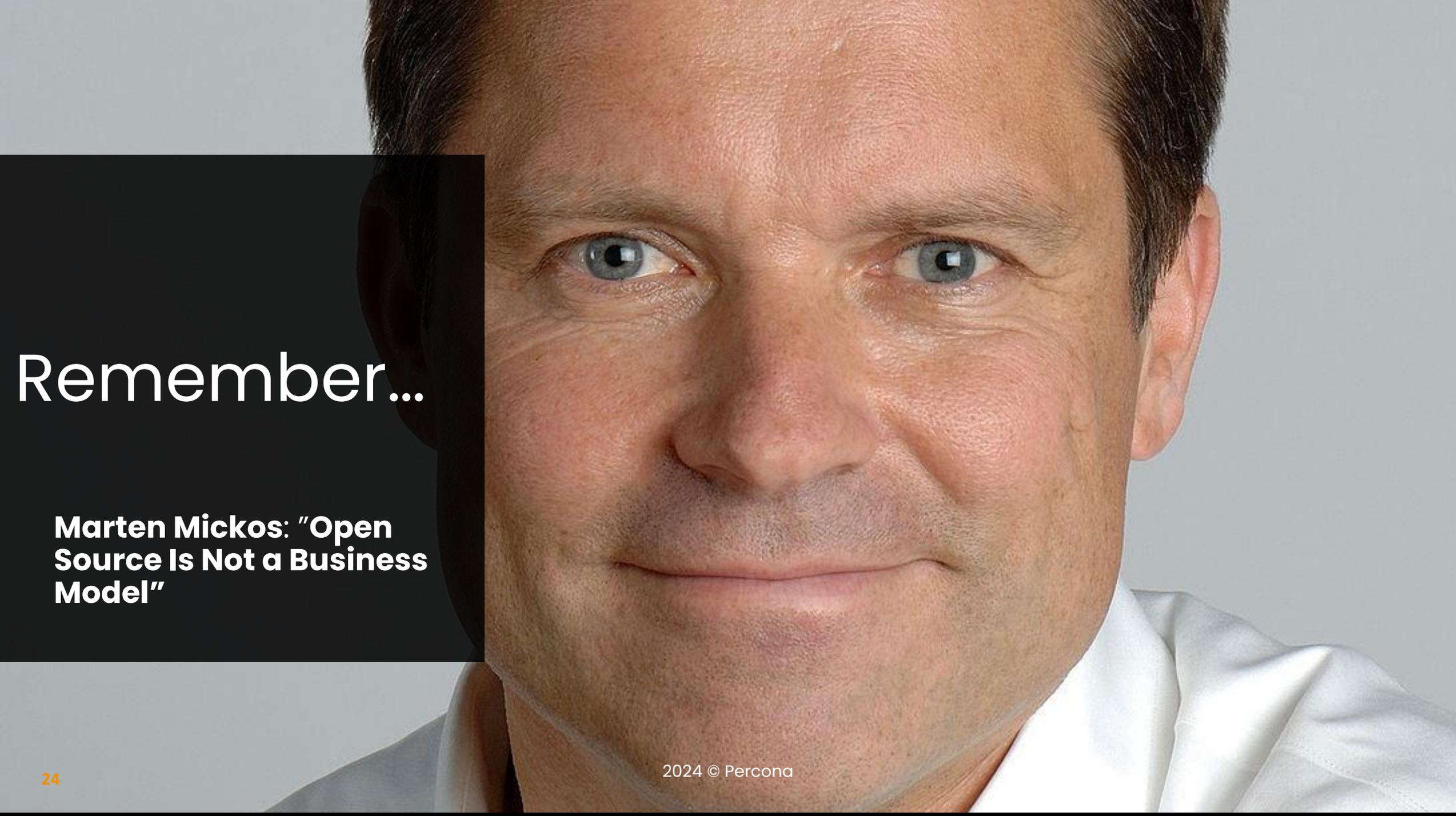
Many will Say:
Cloud



**Maximize and
Simplify
Adoption**

**Change
Opportunities
for Monetization**

Cloud Impact

A close-up portrait of Marten Mickos, a man with short dark hair and blue eyes, wearing a white shirt. The background is a plain, light grey color. On the left side, there is a dark grey vertical bar containing white text.

Remember...

Marten Mickos: "Open Source Is Not a Business Model"

Open Source Ownership and Governance

- Foundation Driven (Multiple Vendors)
- Single Vendor Driven

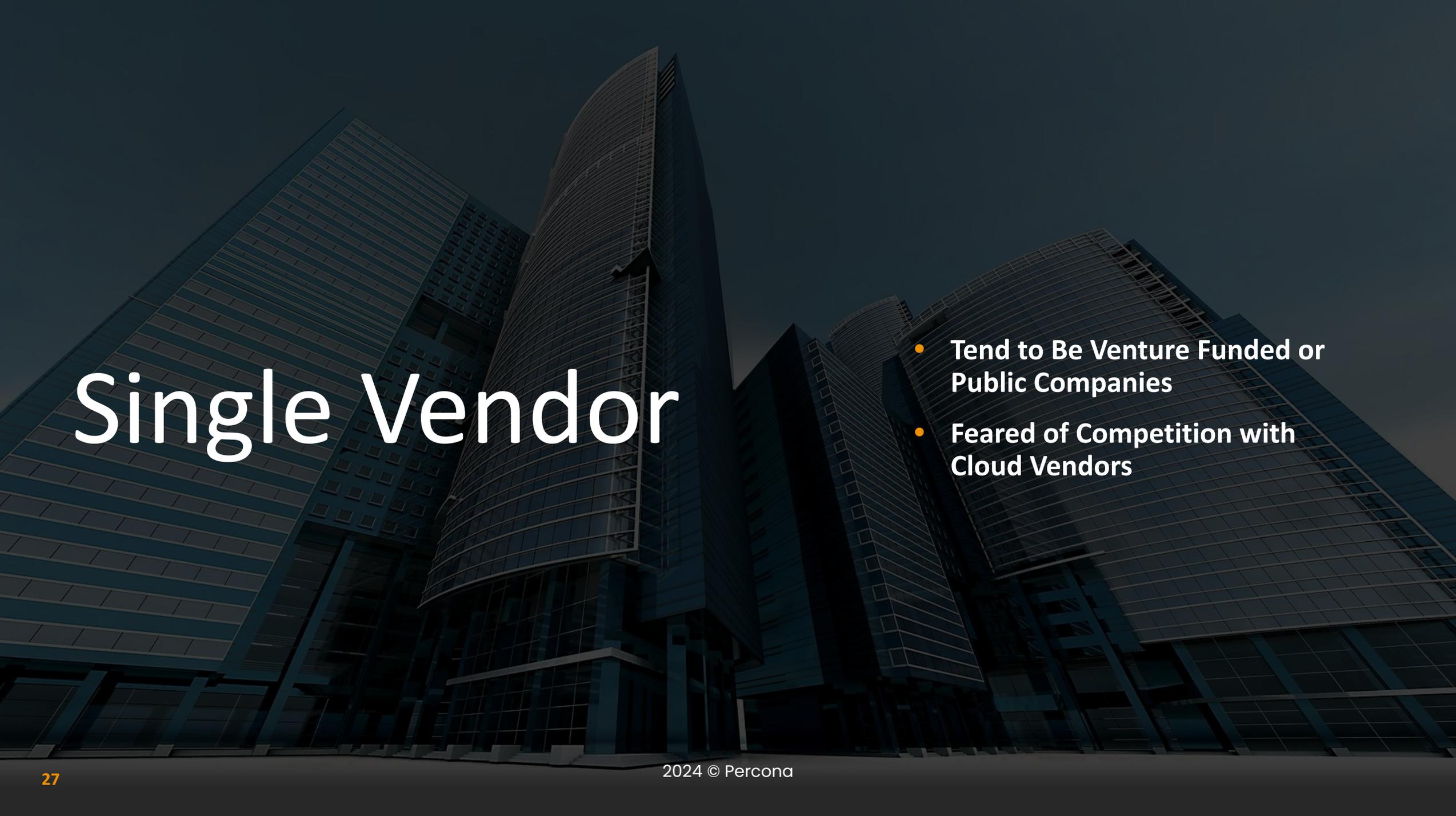


**CLOUD HELPS TO
ACCELERATE ADOPTION**



**CLOUD CHANGES WHO
CAPTURES THE VALUE**

Foundation Based Open Source



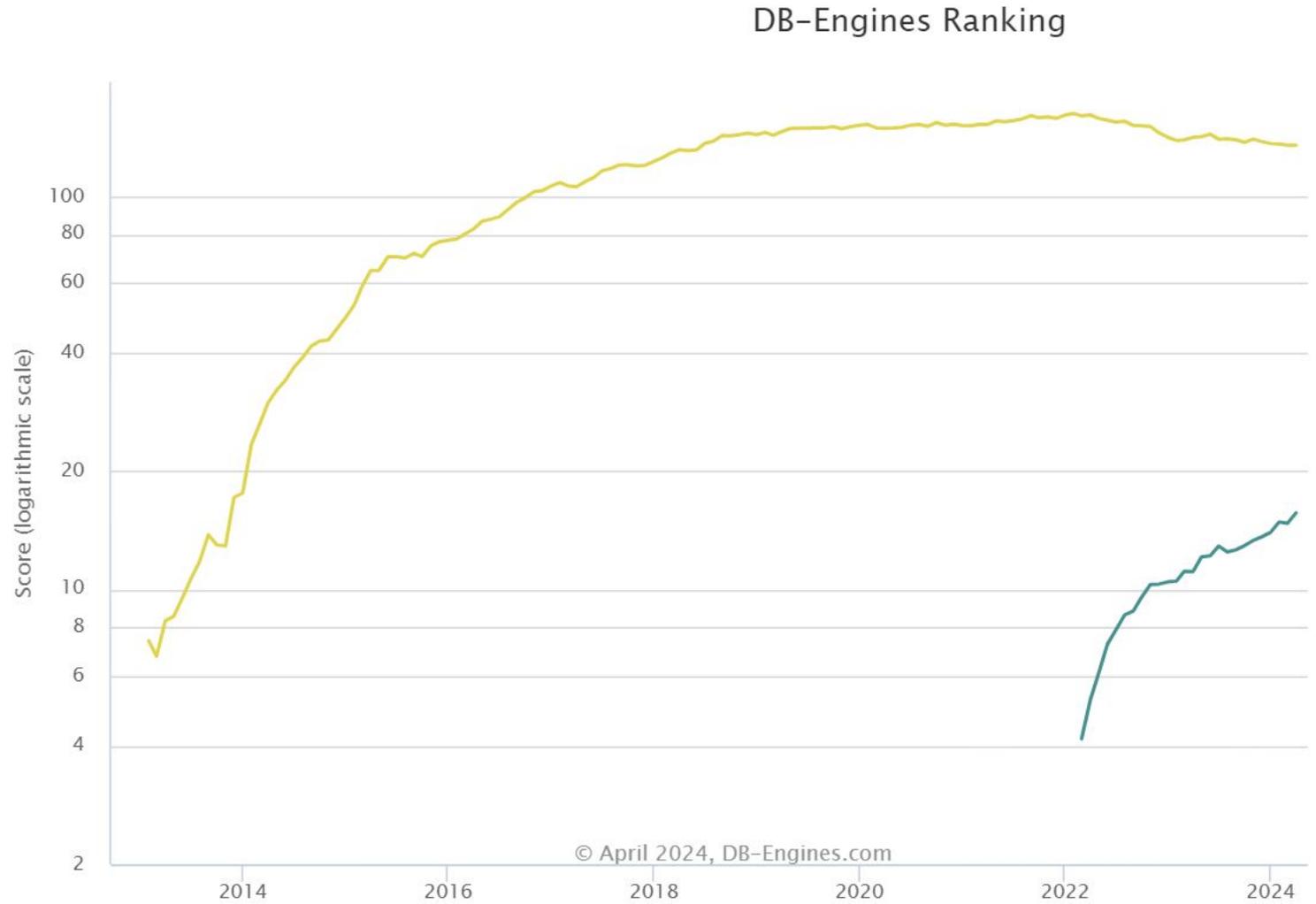
Single Vendor

- Tend to Be Venture Funded or Public Companies
- Feared of Competition with Cloud Vendors

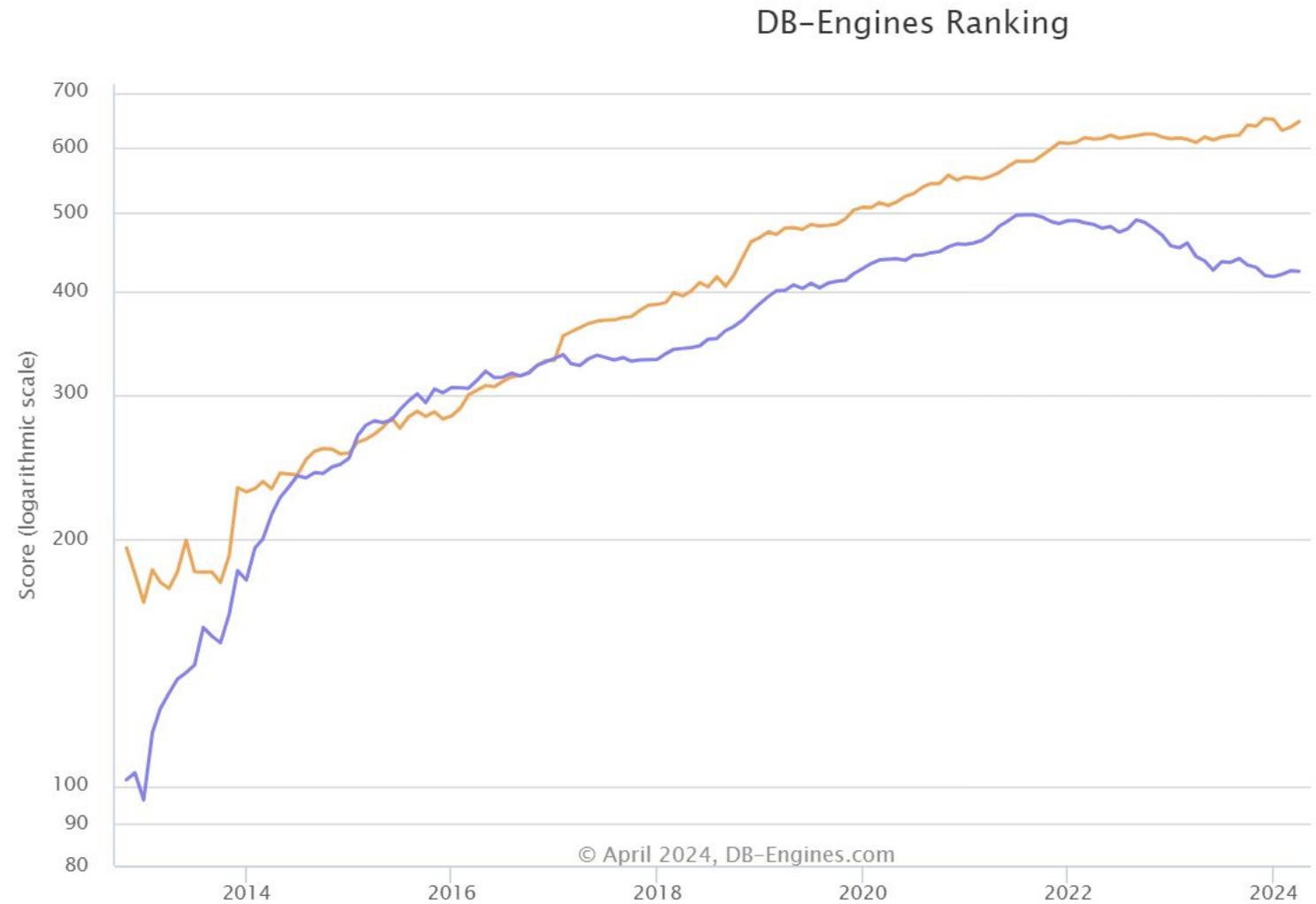
Fully or
Partially
Abandoning
Open Source
Licenses



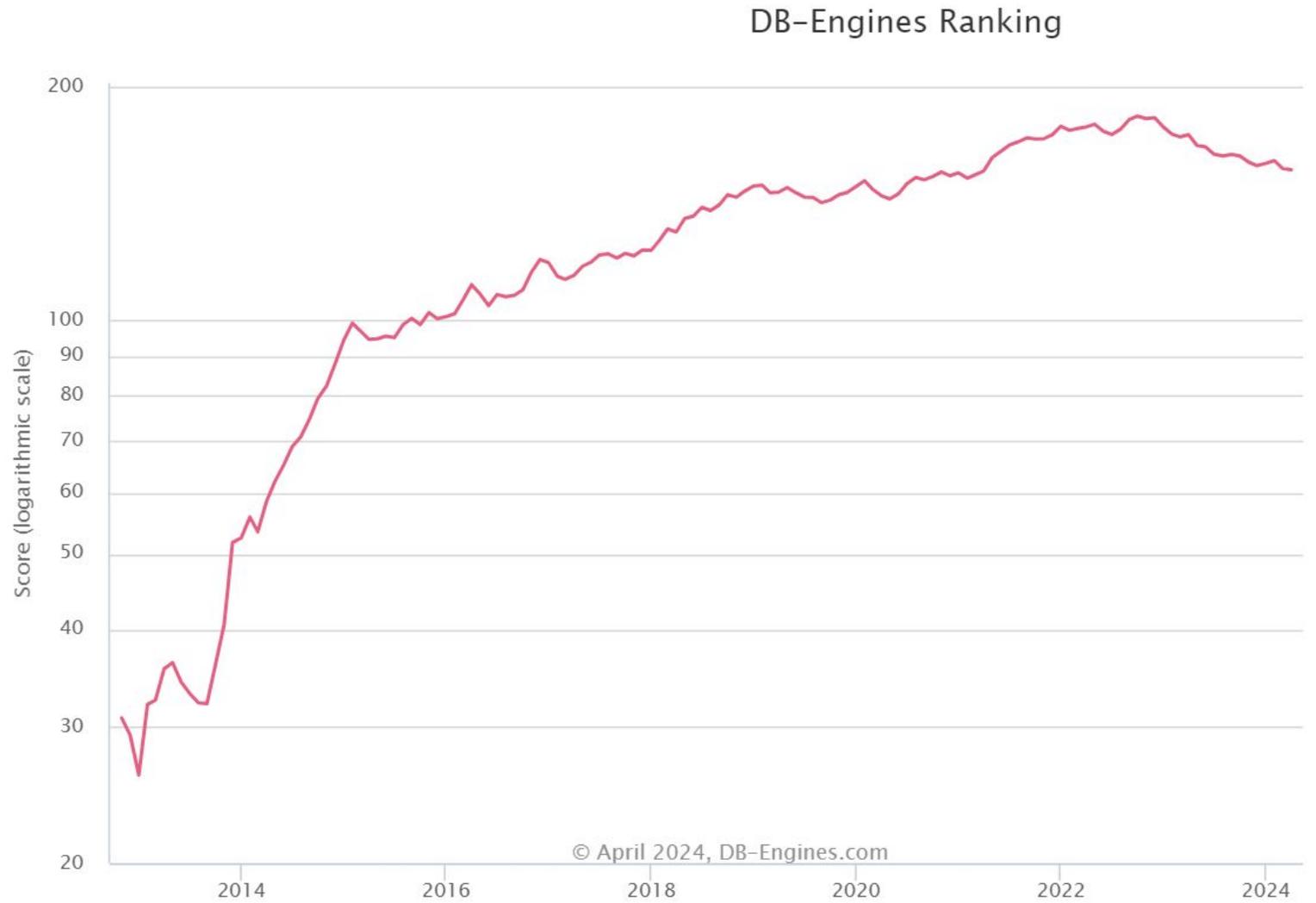
Elastic vs OpenSearch after Licence Change



MongoDB vs PostgreSQL



Redis



Linux Foundation is Stepping Up!

 SIGN IN / UP

The Register®

DATABASES

Linux Foundation marshals support for open source alternative to Redis

7 

Follows the vendor's decision to overhaul licensing of the popular cache database

 Lindsay Clark

Wed 3 Apr 2024 // 11:15 UTC



Cloud giants AWS, Google, and Oracle have come out in support of a Linux Foundation open source fork of Redis, the popular in-memory database frequently used as a cache, following changes to its licensing.

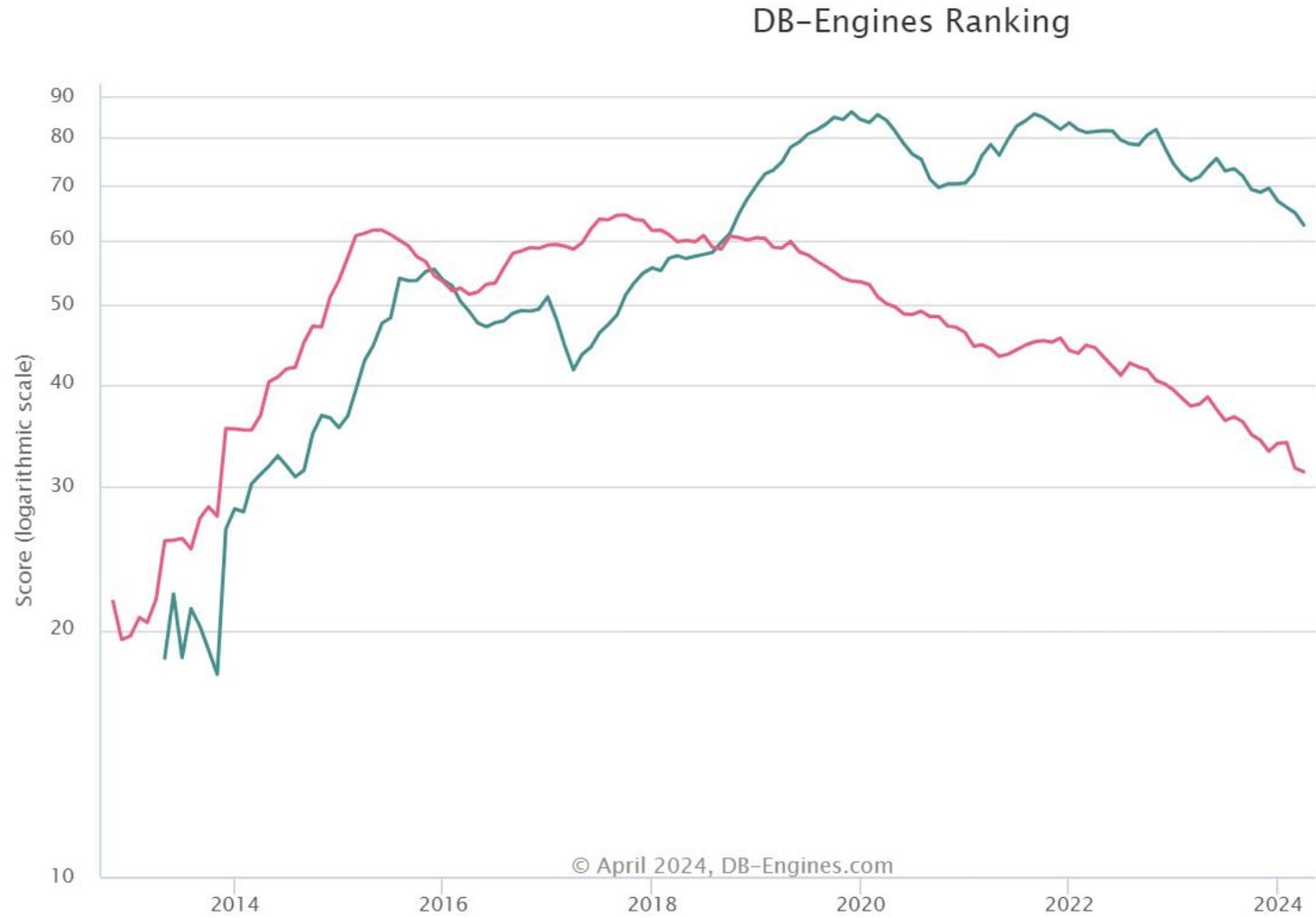
Last month, [Redis confirmed it was shifting its main key-value store system to a dual-license approach](#), imposing far more restrictive terms. Previously, the source code was available under the Berkeley Software Distribution (BSD) 3-clause license, which allows developers to make commercial use of the code without paying.

https://www.theregister.com/2024/04/03/open_source_redis_alternative/

Percona Joins the Effort!



Hive (Blue) and HBase





Database as a Service.

Primary Goal of the License Change?

- **Creating Monopoly on DBaaS Market**



STATE OF ART SIMPLICITY



**HIGH LEVEL OF
AUTOMATION**



**MAXIMIZES DEVELOPERS
FOCUS ON APPLICATION**

Why DBaaS?

What Is the Problem with Monopoly on DBaaS?

MONOPOLY

A photograph of a server rack. The server units are illuminated with bright green lights, and there are numerous blue and white cables connected to the front panels. The background is dark, making the lights stand out.

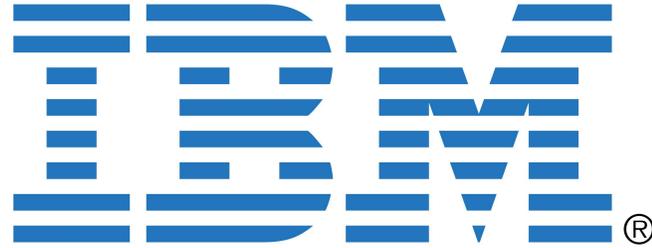
No Different from Proprietary Software

Using DBaaS is a very different skill compared to rolling your own database setup



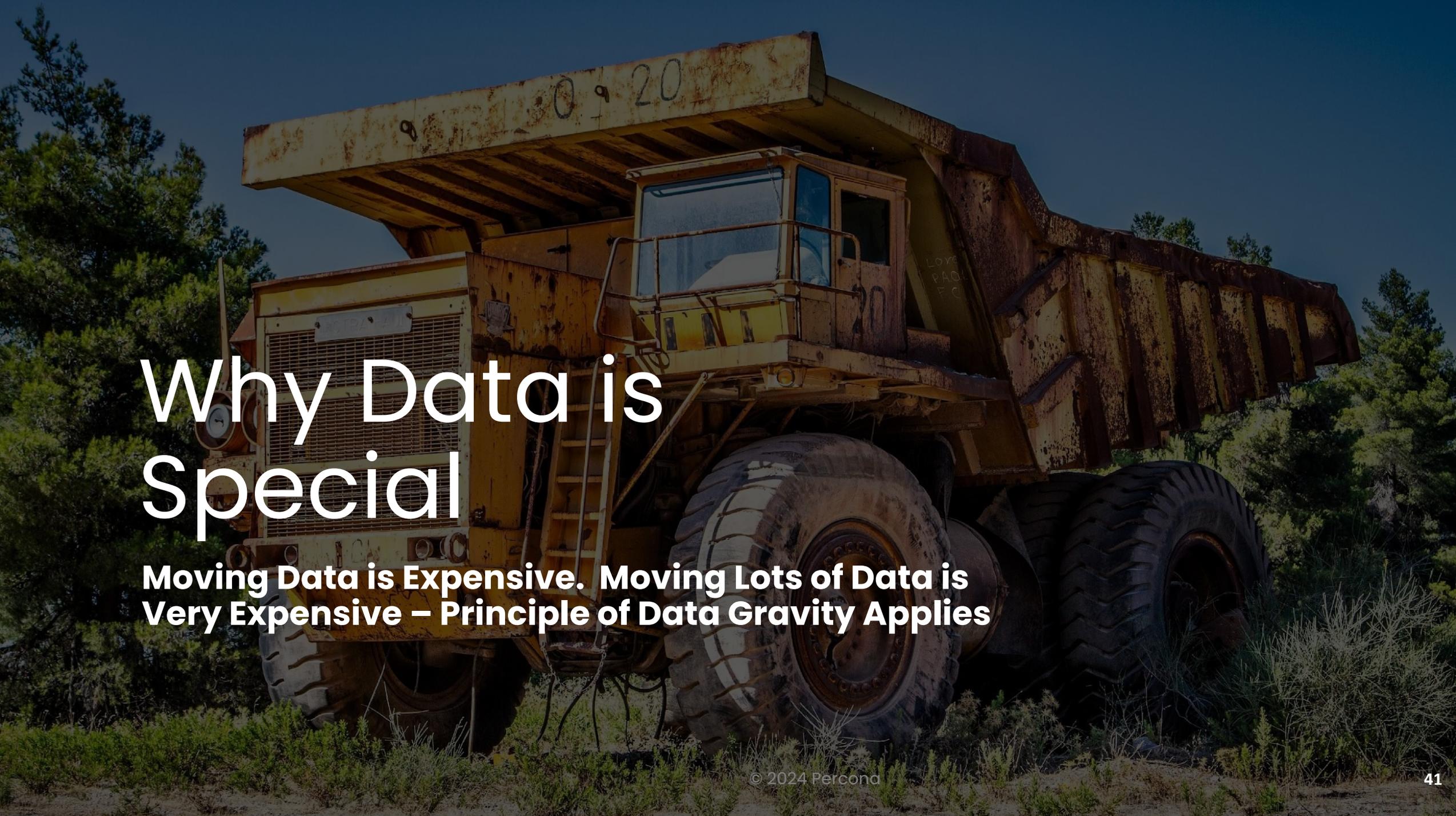
DBaaS Vendor Lock-In

It may not be so painful **now**, but it is going to be painful in the **future**



History Lesson

**Oracle used to Save its customer from IBM
Hardware Lock-in with Mainframe computers**



Why Data is Special

Moving Data is Expensive. Moving Lots of Data is Very Expensive – Principle of Data Gravity Applies

Not All Is Lost



Have We
Been Here
Before?

2000s



2020s



Operating
Systems



Giving Cloud Its Originally Intended Role of Commodity Infrastructure

What is Cloud Computing?

An analogy: think of electricity services...

You simply plug into a vast electrical grid managed by experts to get a low cost, reliable power supply – available to you with much greater efficiency than you could generate on your own.



Power is a utility service - available to you on-demand and you pay only for what you use.

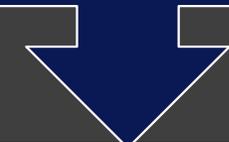


Kubernetes



kubernetes

Kubernetes is universally available



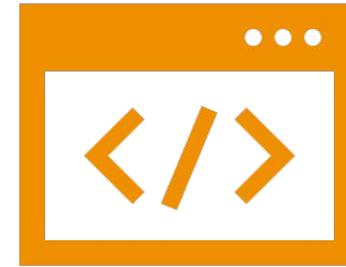
Kubernetes is getting better for stateful applications



Kubernetes Operators are available for most popular Open Source Databases



**Day 1 and Day 2 Automation, Toil
Reduction Similar to DBaaS**



**UX is Different, Requires
Kubernetes Expertise**

What's Up with Kubernetes Operators?

Can We Build DBaaS on Kubernetes?



Database as a Service.

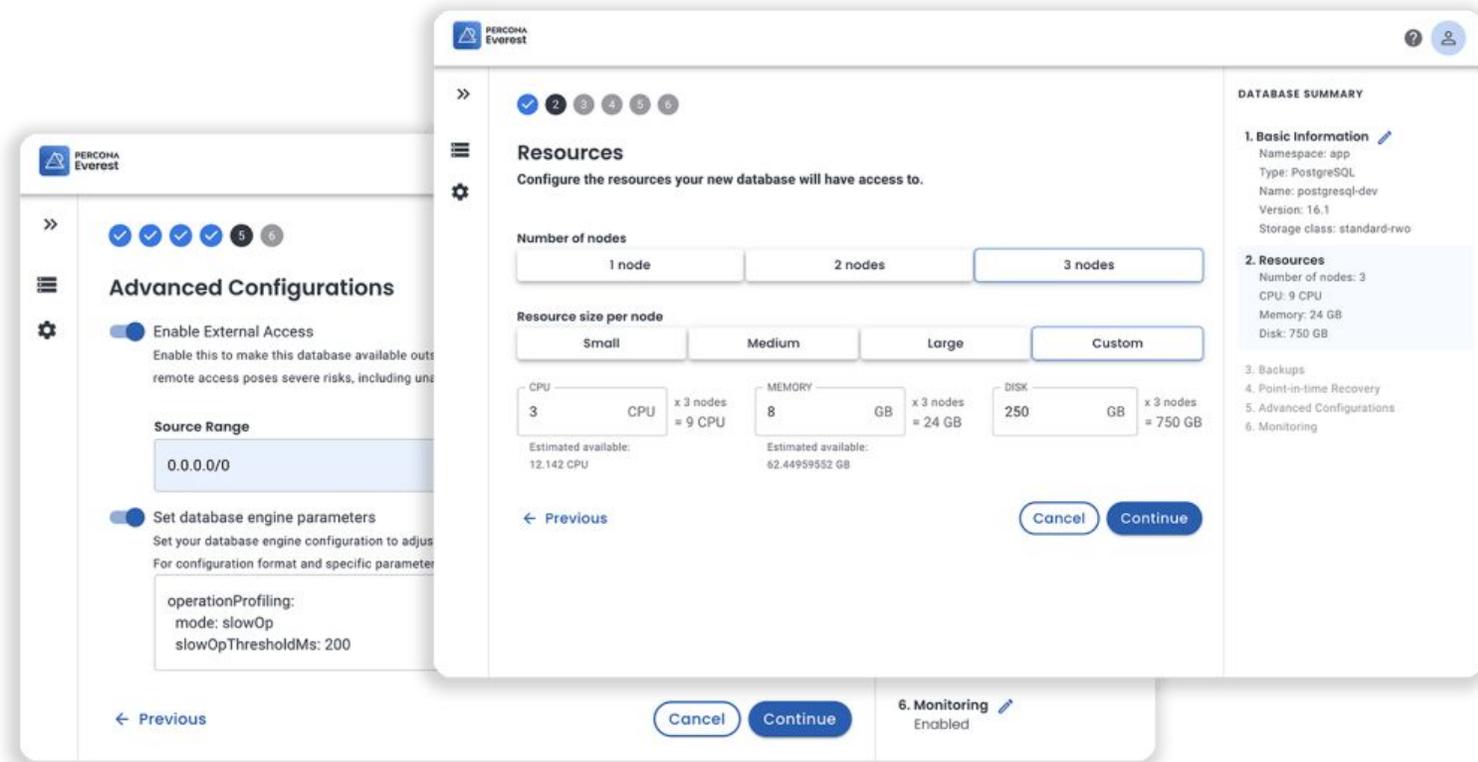


kubernetes

Many Modern DBaaS are Built on Kubernetes Operators



Open Source DBaaS Experience with Percona Everest



Summary



**Fantastic Pace
Innovation**



**Evolving Open
Source Models**



Great Future



Thank you! Let's Connect!

<https://www.linkedin.com/in/peterzaitsev/>

<https://twitter.com/PeterZaitsev>

<http://www.peterzaitsev.com>

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