**IN PARTNERSHIP WITH:**

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FerretDB

# Welcome

Peter Zaitsev,
Founder at Percona
May 26, 2025

PG ARMENIA x PERCONA UNIVERSITY

AUG 28 YEREVAN

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Special Thanks to our Partners and Organisers

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# Max Cano Ruiz

Your friendly
Percona Sales Person

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# Bring Percona University to Your City!

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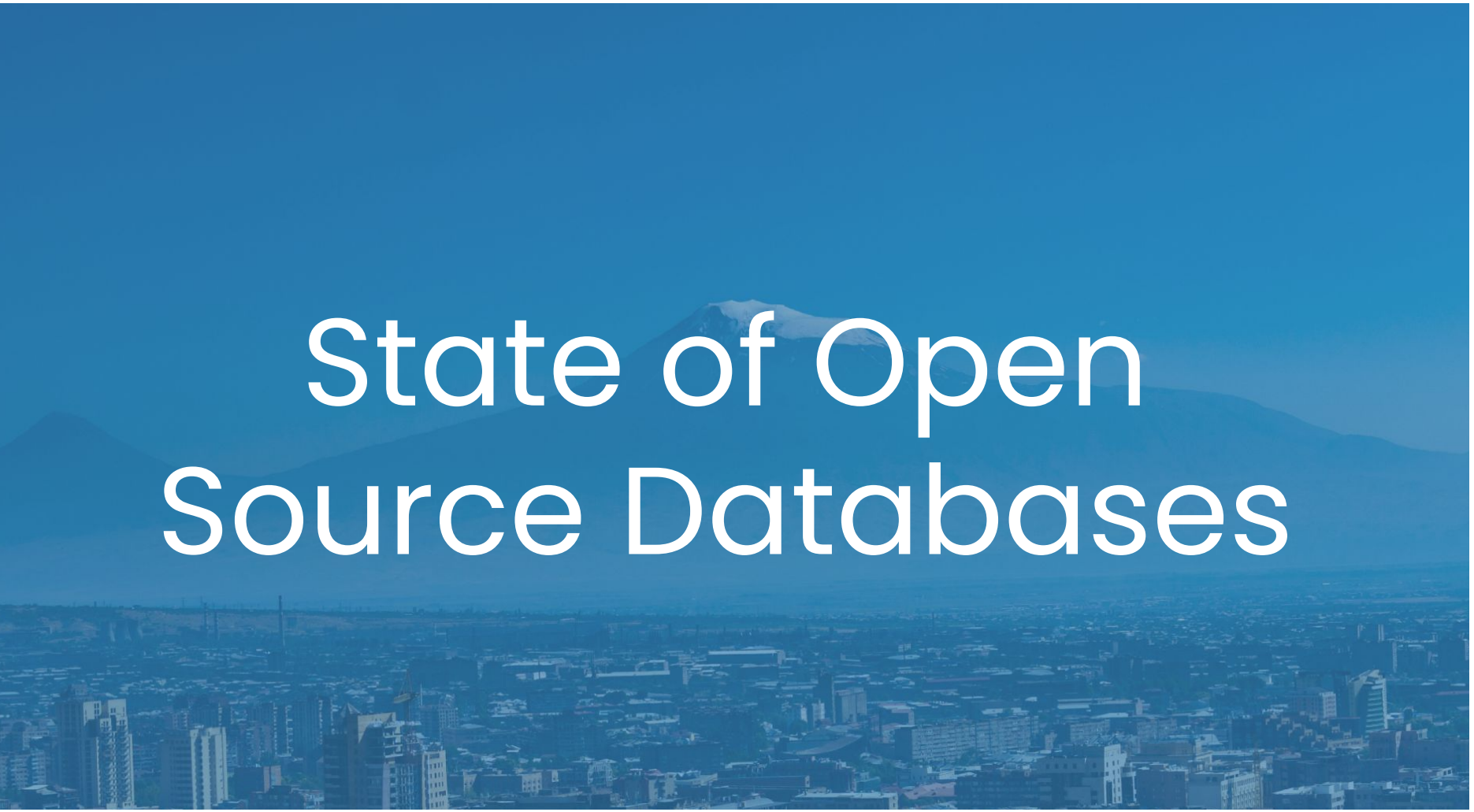
## Current openings include:

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



# State of Open Source Databases

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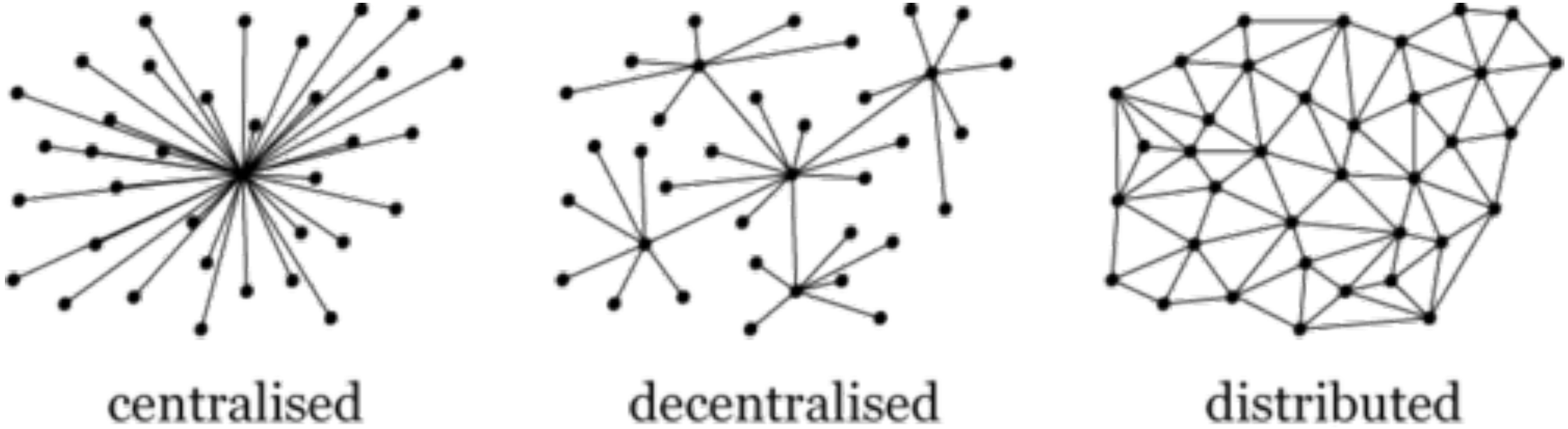
Innovation




# Distributed Databases

# Separation of Storage and Compute

# Serverless

# HTAP – Hybrid Transactional Analytical Processing

Data Pipelines

# Multiple Databases

- Microservices
- Developers Authority
- Cloud

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**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**

# What's Up with Vectors

- **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**

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

# Specific Tasks

Pattern Recognition

Semantic Search

RAG – “Retrieval Augmented Generation”

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# 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

# Remember...

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

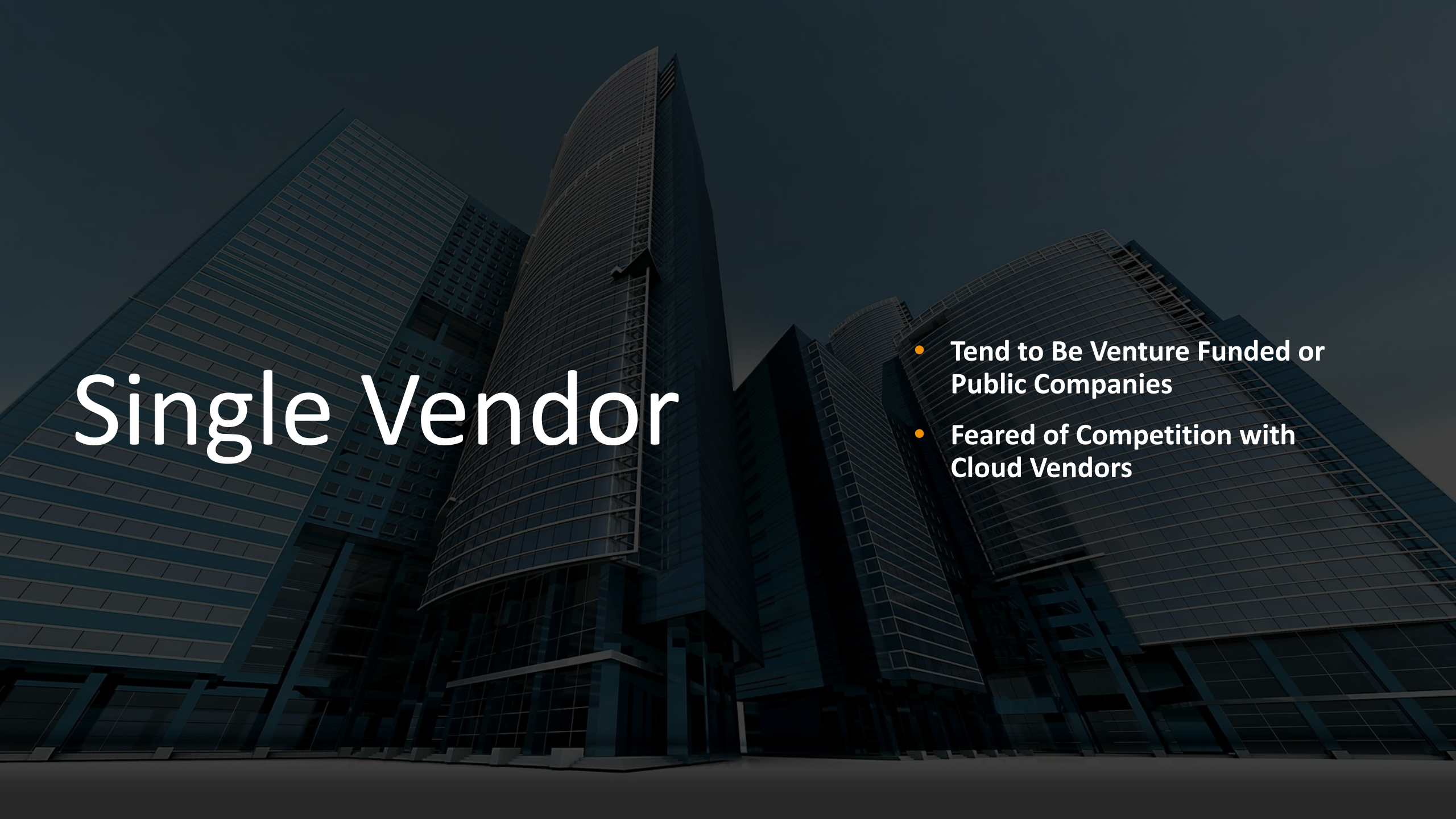
# Open Source Ownership and Governance

- **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

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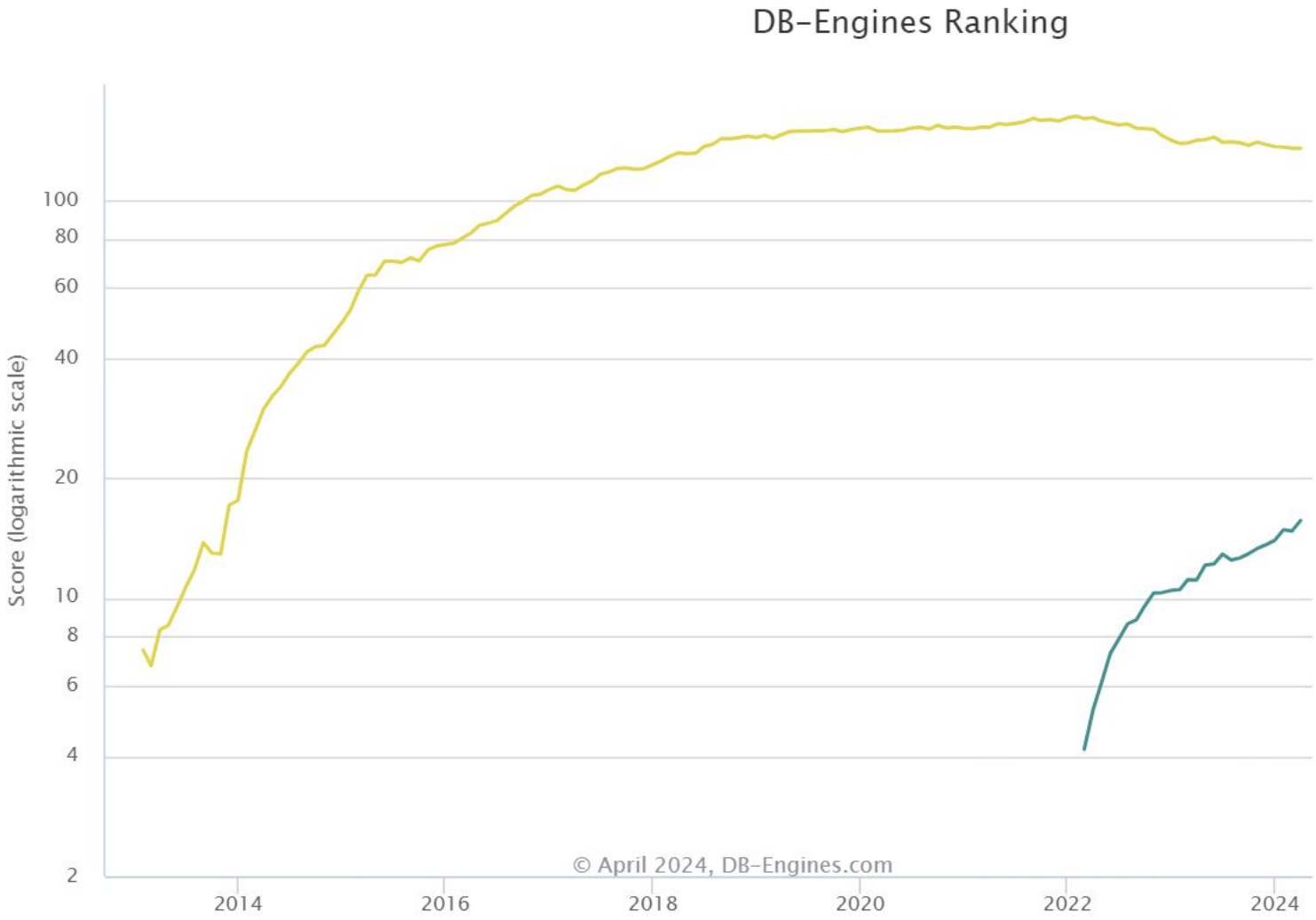
# Elastic vs OpenSearch after Licence Change

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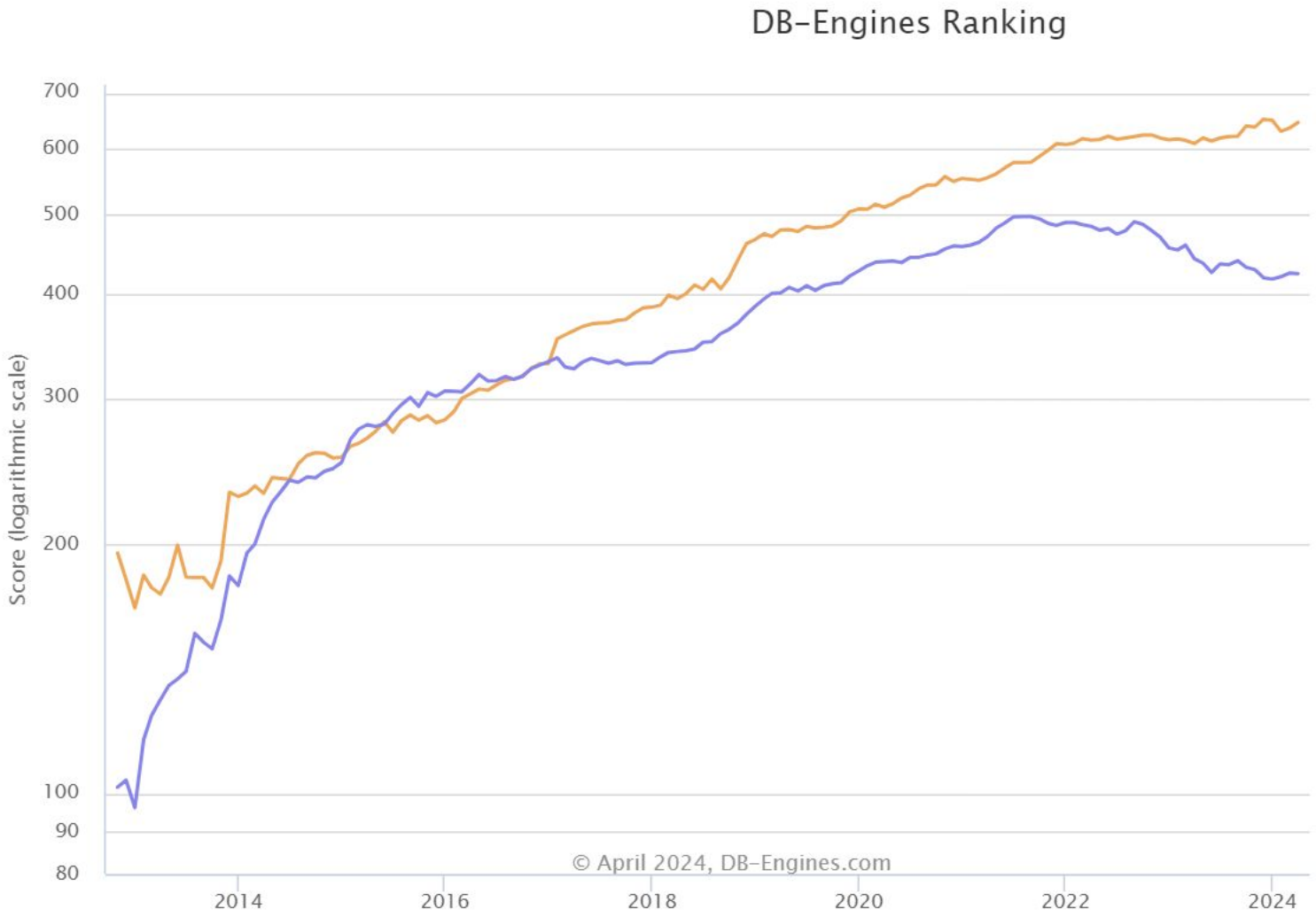
# MongoDB vs PostgreSQL

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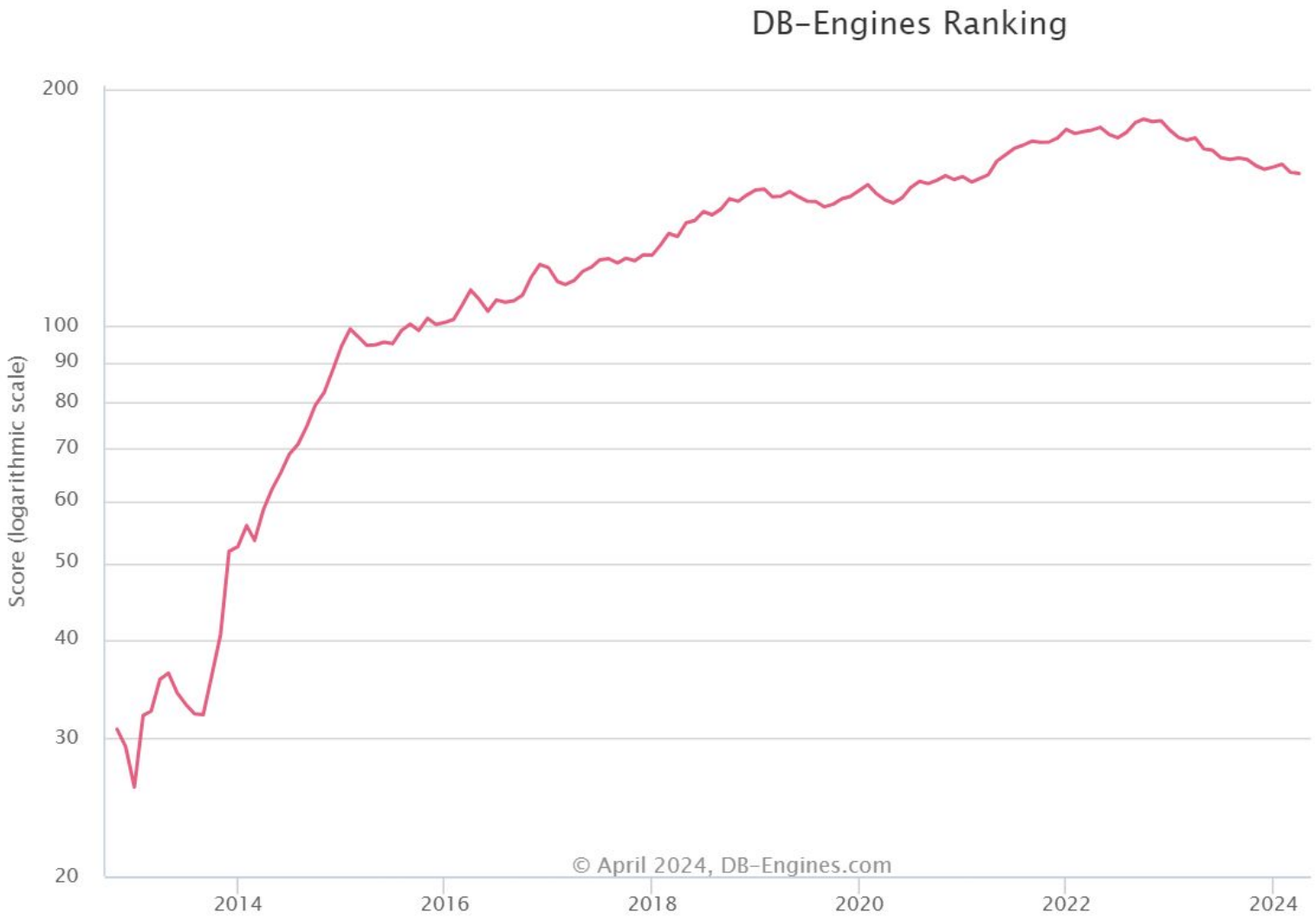
# Redis

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# Linux Foundation is Stepping Up!

SIGN IN / UP

The Register

DATABASES

7

## Linux Foundation marshals support for open source alternative to Redis

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/

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# Percona Joins the Effort!

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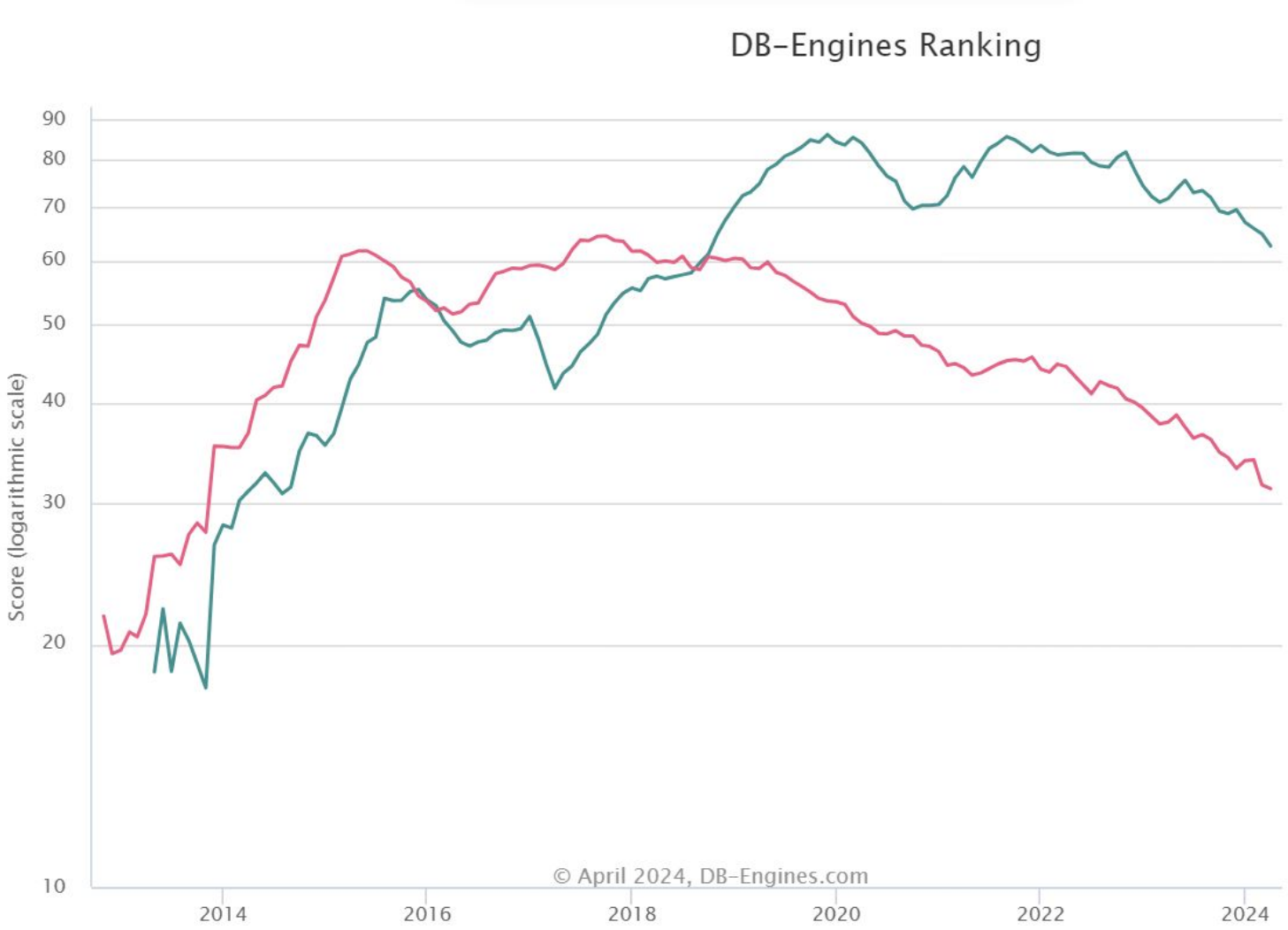
# Hive (Blue) and HBase

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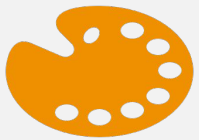
# Primary Goal of the License Change?

- **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?

# No Different from Proprietary Software

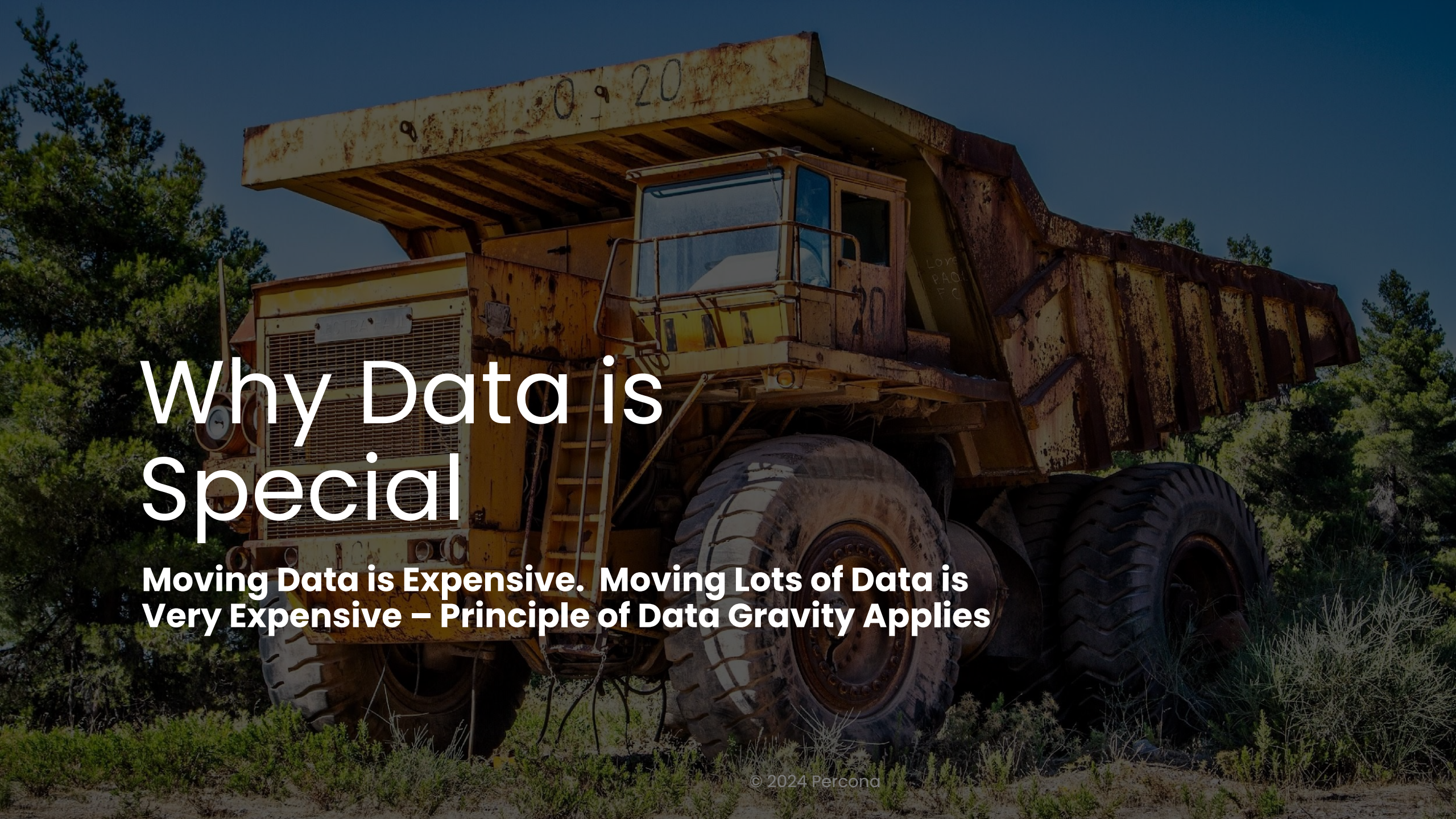
**Using DBaaS is a very different skill compared to rolling your own database setup**

# 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**

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# Not All Is Lost

# Have We Been Here Before?

## 2000s

## 2020s

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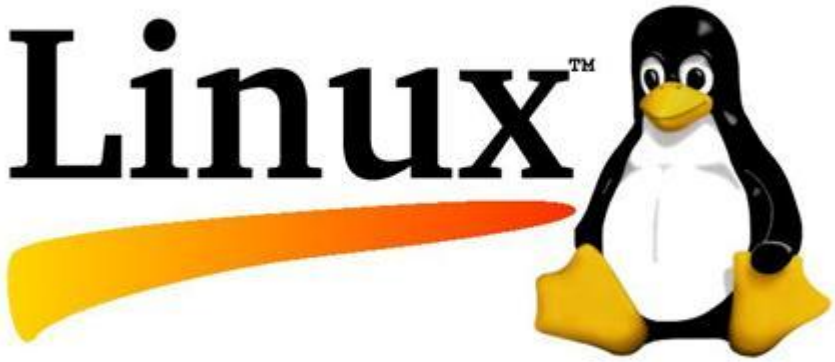
# Operating Systems

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# Open Source Catches Up Again

- **Lock-in with Cloud Vendor**
- **Use Proprietary Solutions**
- **Highly Differentiated Cloud**
-
-

- **Freedom to Run Anywhere**
- **Use Open Source**
- **Cloud Is Commodity**
- **Customer**
- **Choice of Vendors**

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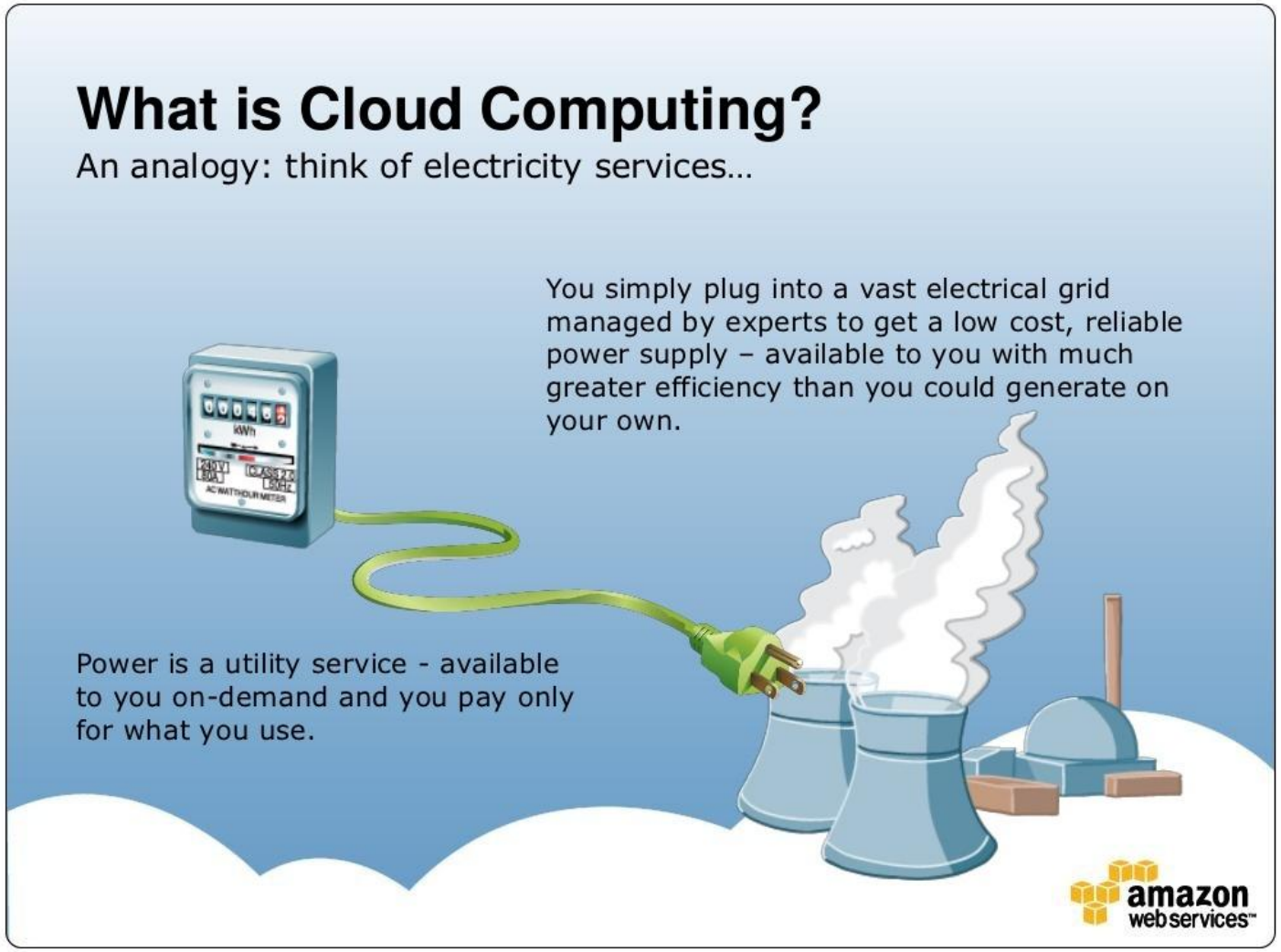
# Giving Cloud Its Originally Intended Role of Commodity Infrastructure

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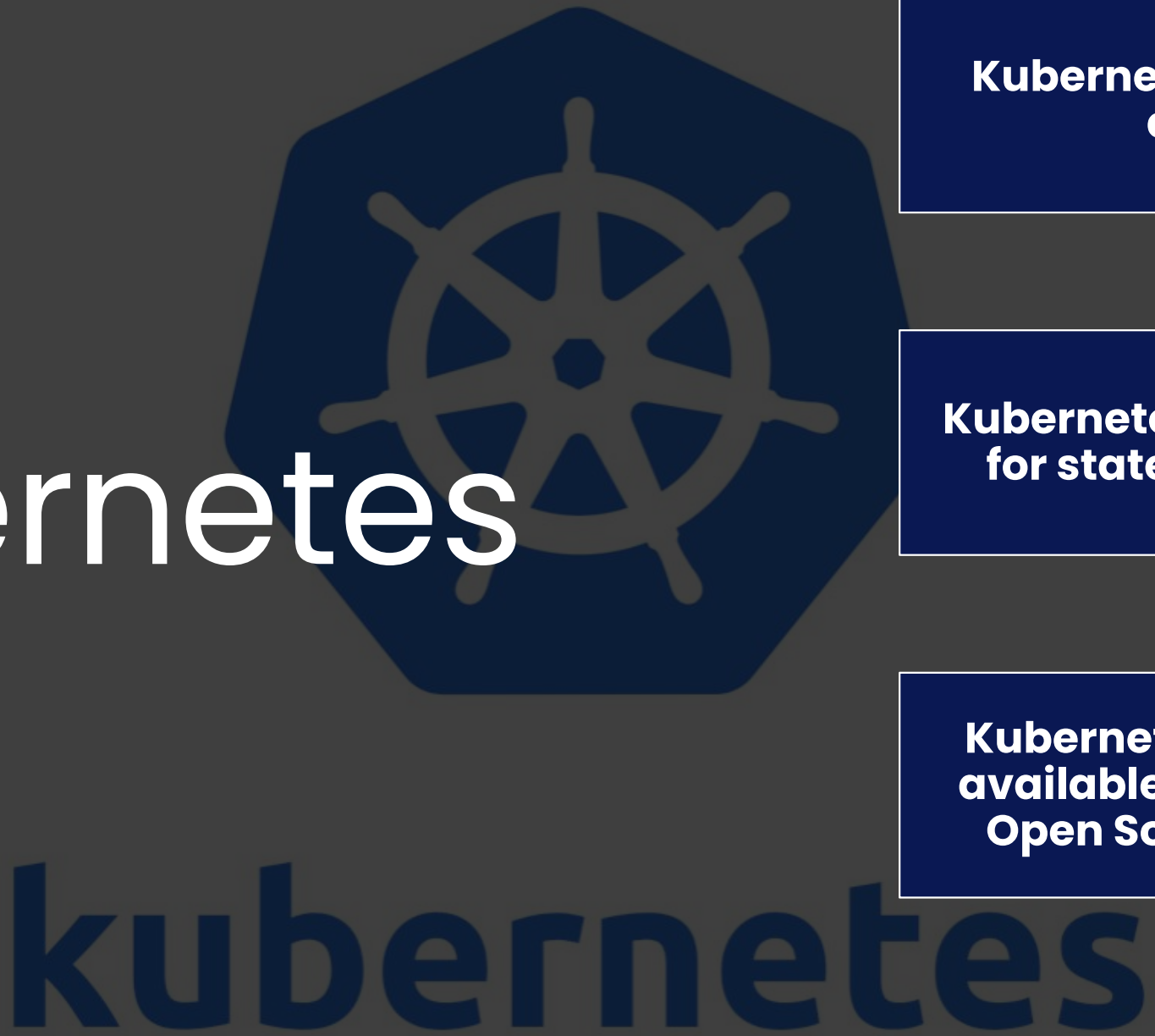
# Kubernetes




**Kubernetes is universally available**

**Kubernetes is getting better for stateful applications**

**Kubernetes Operators are available for most popular Open Source Databases**



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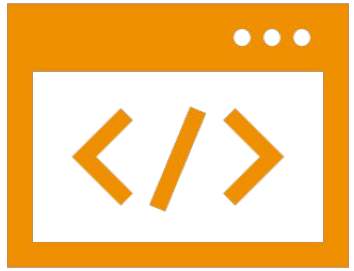
**Day 1 and Day 2 Automation, Toil Reduction Similar to DBaaS**



**UX is Different, Requires Kubernetes Expertise**

# What's Up with Kubernetes Operators?

# Can We Build DBaaS on Kubernetes?

Database as a Service.

kubernetes

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# Many Modern DBaaS are Built on Kubernetes Operators

Altinity

influxdata

MariaDB

crunchy data

BIG ANIMAL

planetscale

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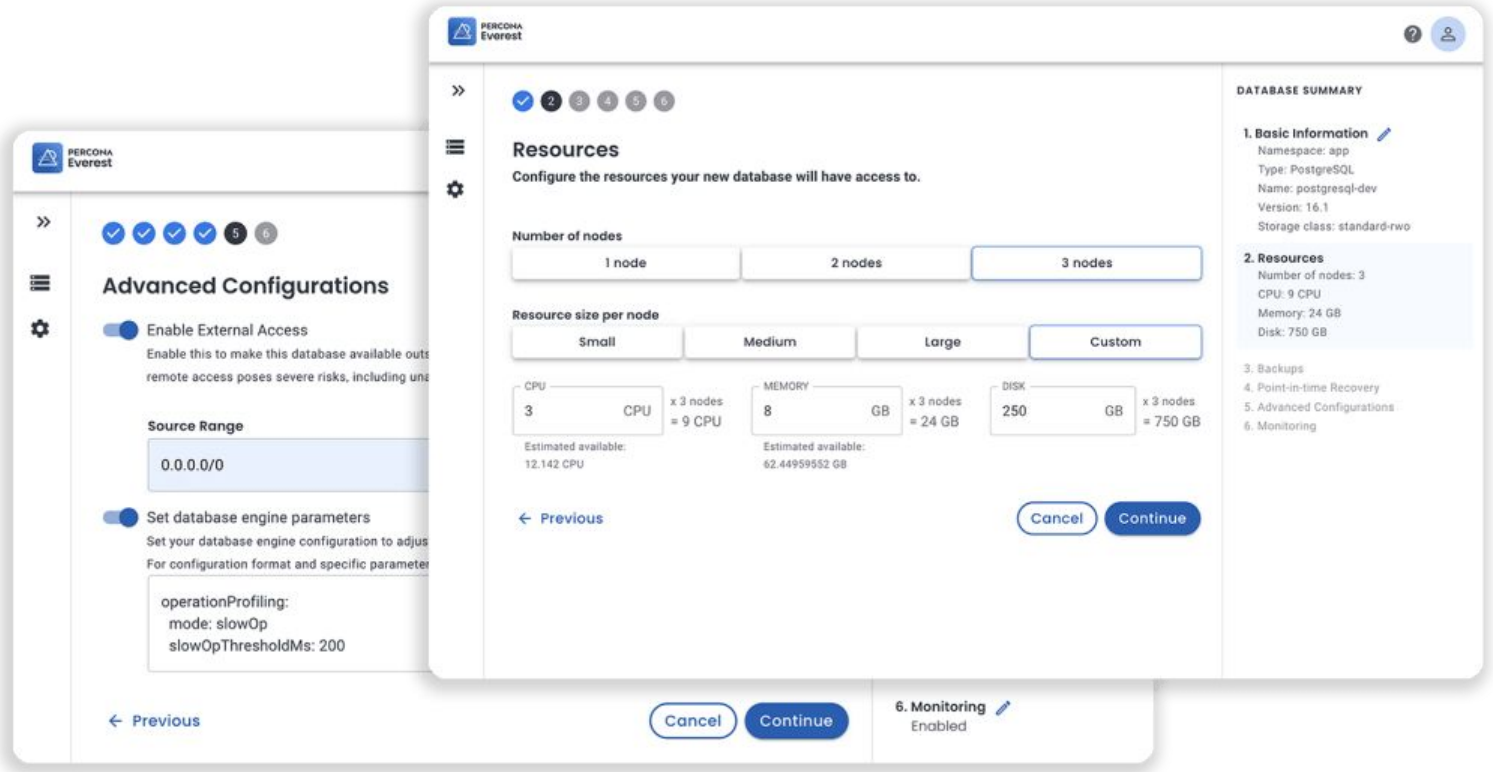
# Open Source DBaaS Experience with Percona Everest

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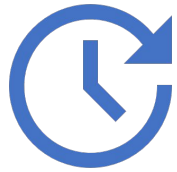
# Summary

**Fantastic Pace Innovation**

**Evolving Open Source Models**



**Great Future**

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# Thank you!
# Let's Connect!

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