
Singapore 2024
PERCONA
UNIVERSITY
Open Source Databases Meetup

Welcome

Peter Zaitsev,
Founder at Percona
April 25, 2024

Singapore 2024
PERCONA UNIVERSITY

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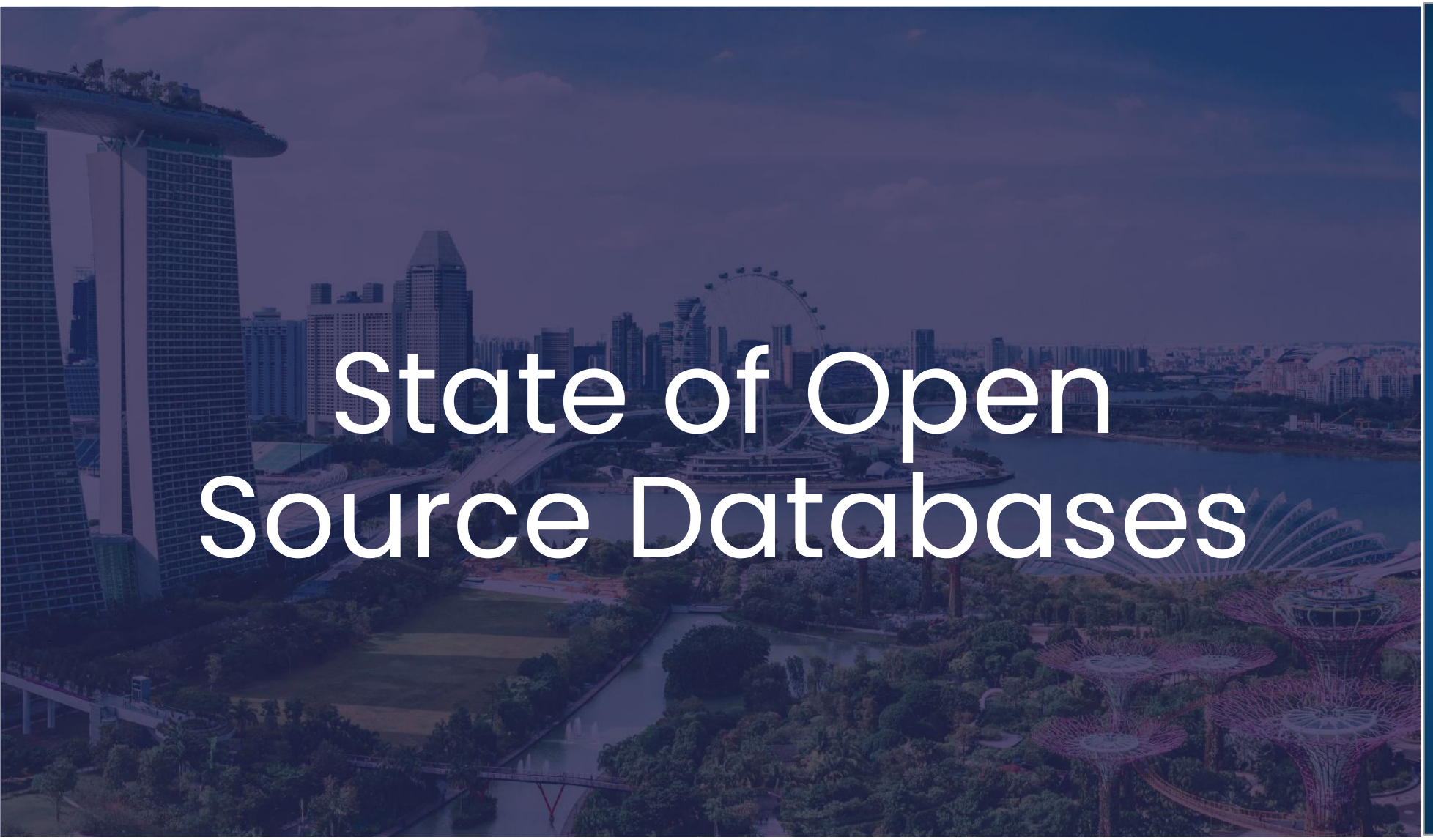
Current openings include:

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

Bring Percona University to Your City!



State of Open Source Databases

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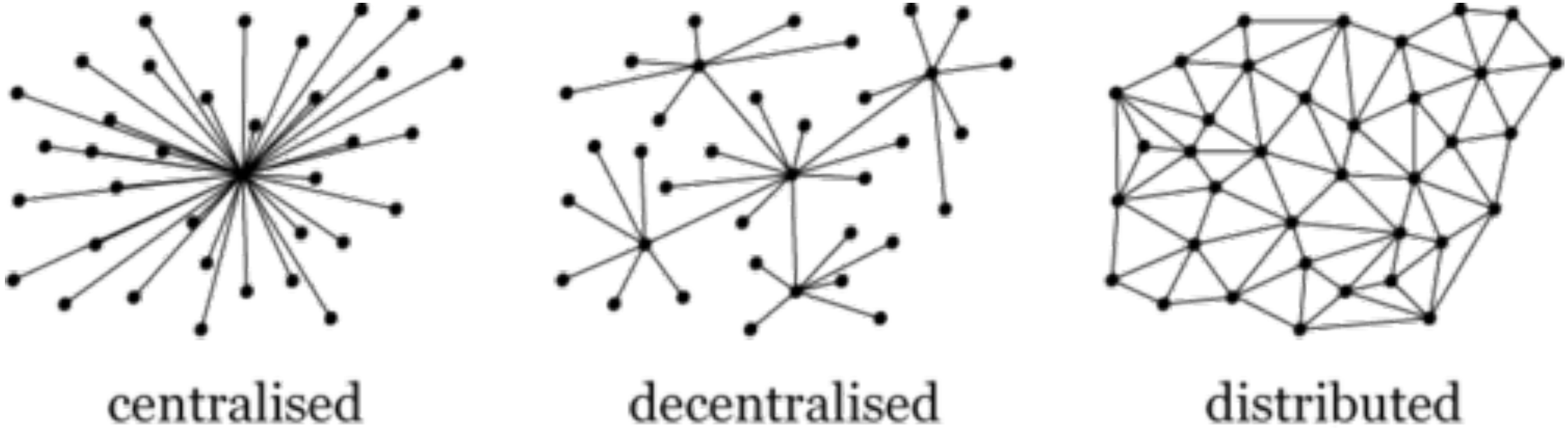
Innovation



Distributed Databases

Separation of Storage and Compute

Serverless

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HTAP – Hybrid Transactional Analytical Processing

Multiple Databases

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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

Shapechangers

Clickhouse can speak PostgreSQL and MySQL Protocols

VictoriaMetrics has InfluxDB and Graphite API

FerretDB allows to use PostgreSQL as if it were MongoDB

Babelfish turns PostgreSQL in MS SQL Compatible Database

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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

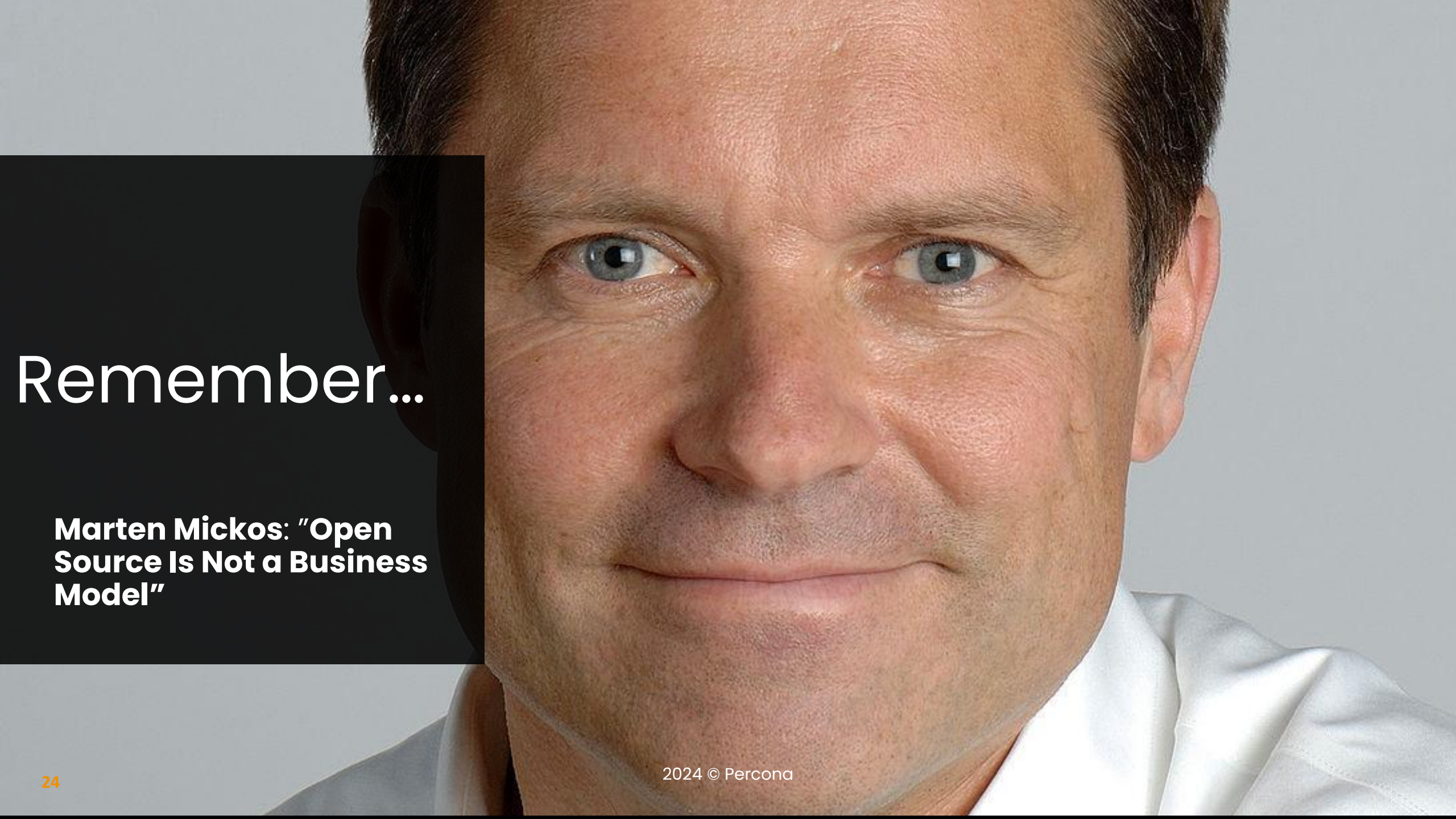
Maximize and Simplify Adoption

Change Opportunities for Monetization

Cloud Impact

Remember...

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



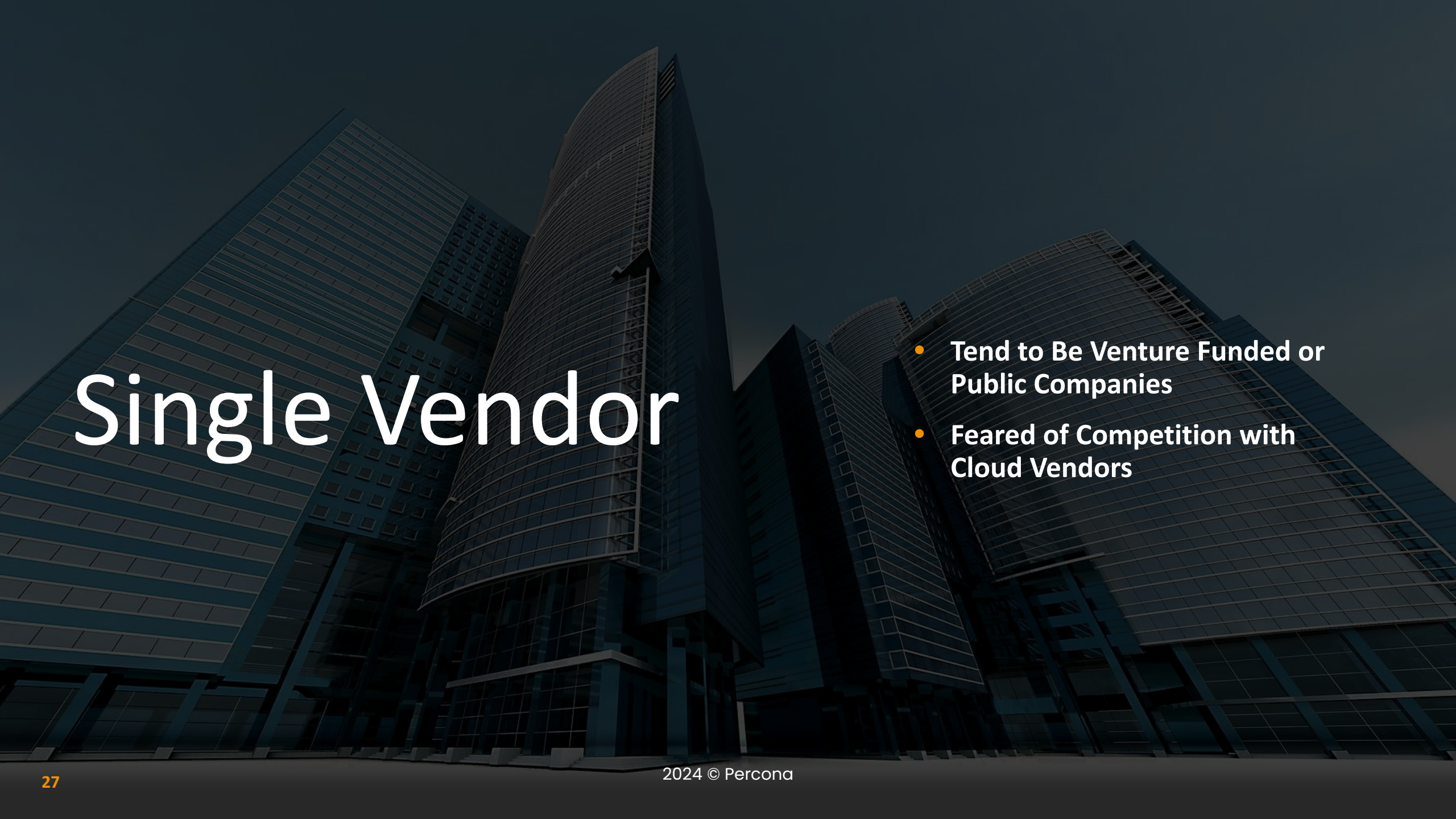
Open Source Ownership and Governance

- **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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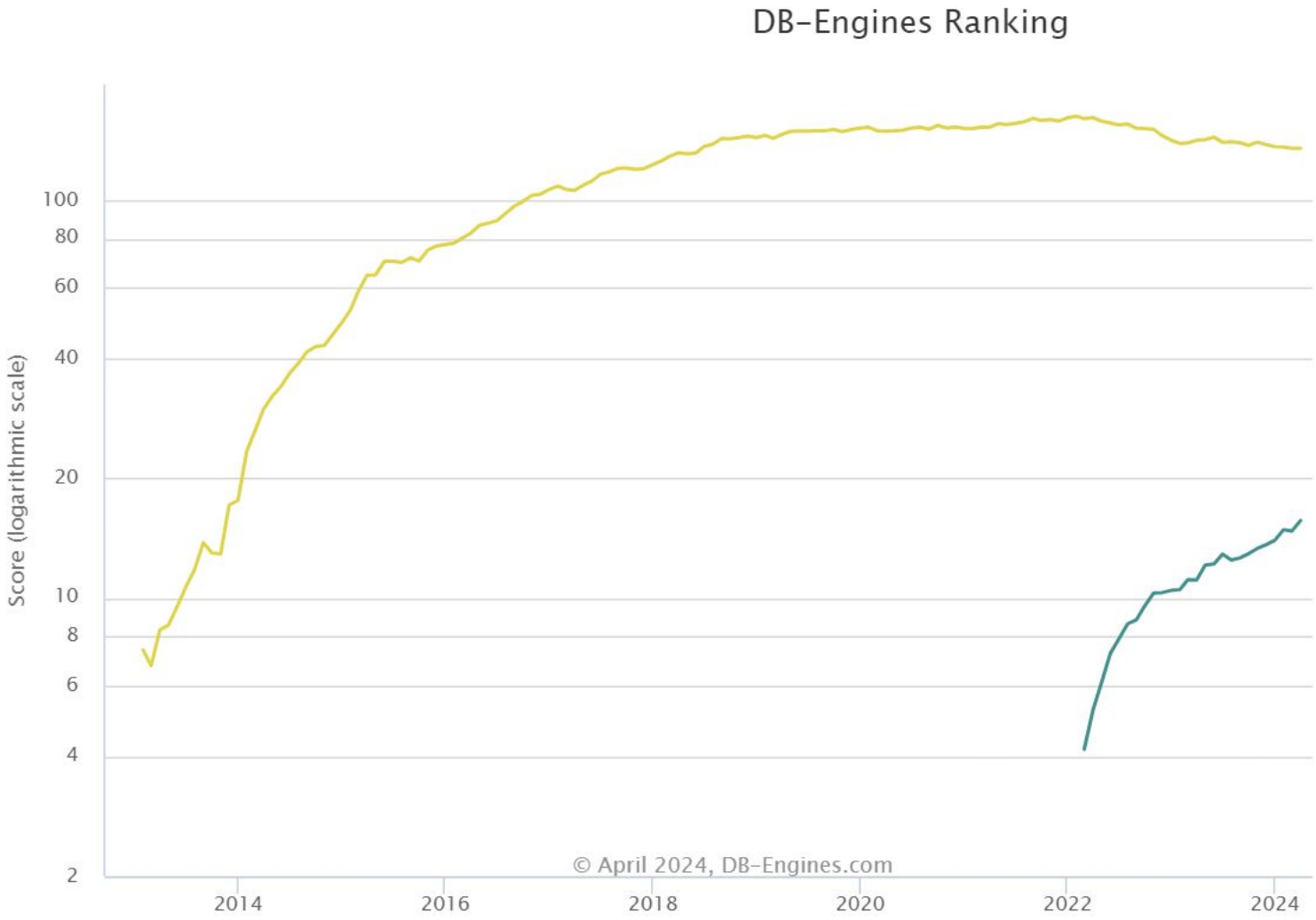
Elastic vs OpenSearch after Licence Change



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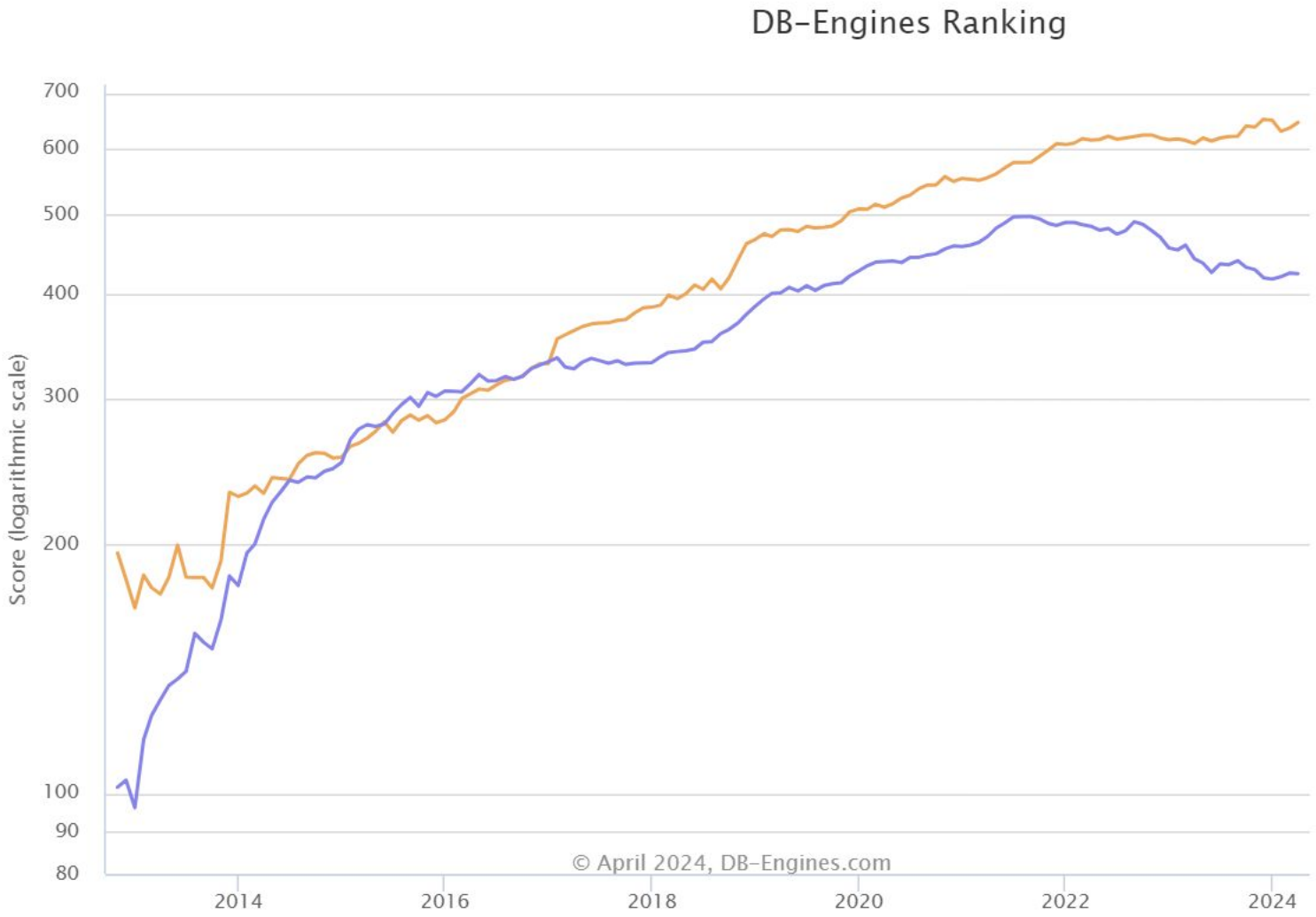
MongoDB vs PostgreSQL



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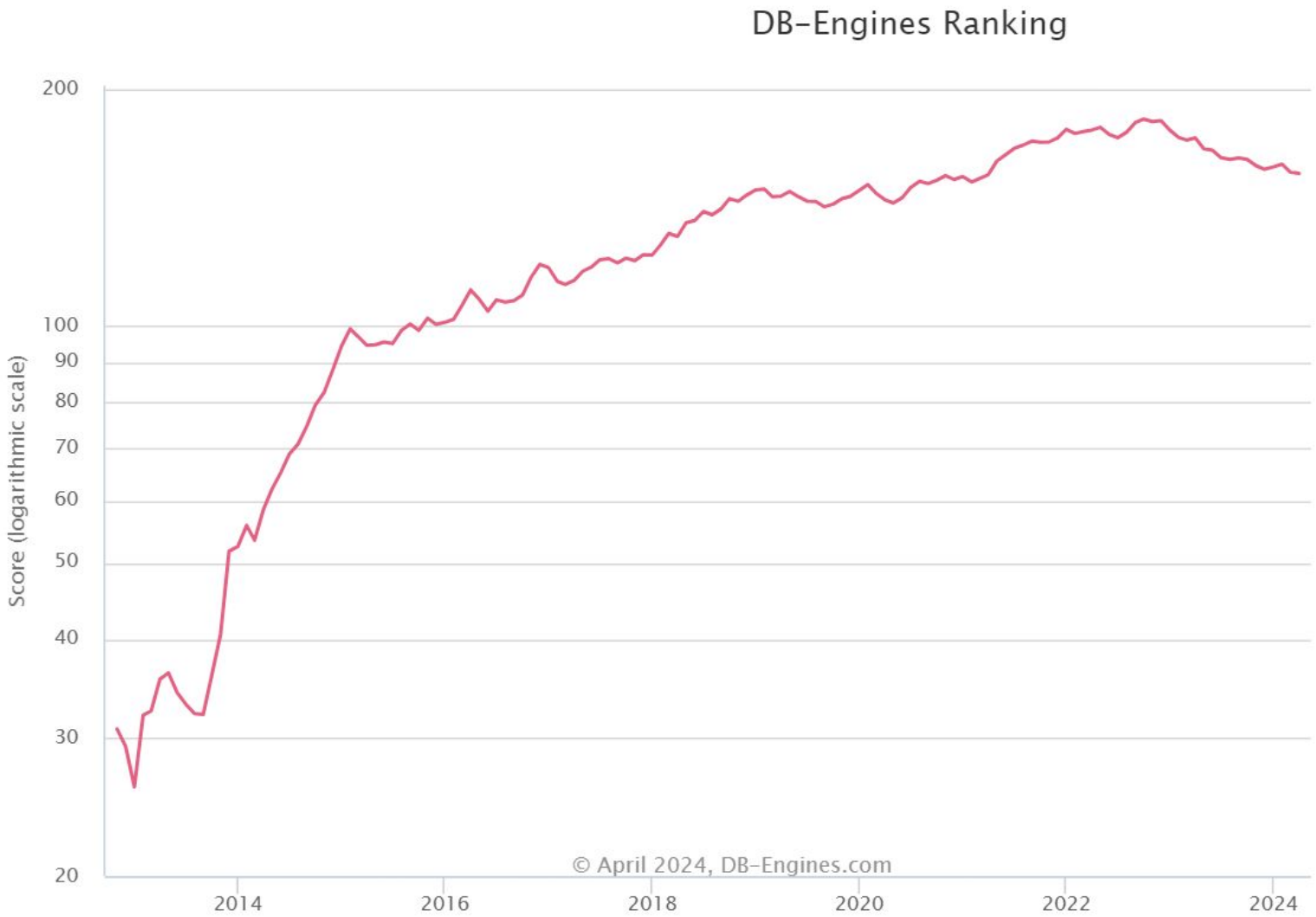
Redis



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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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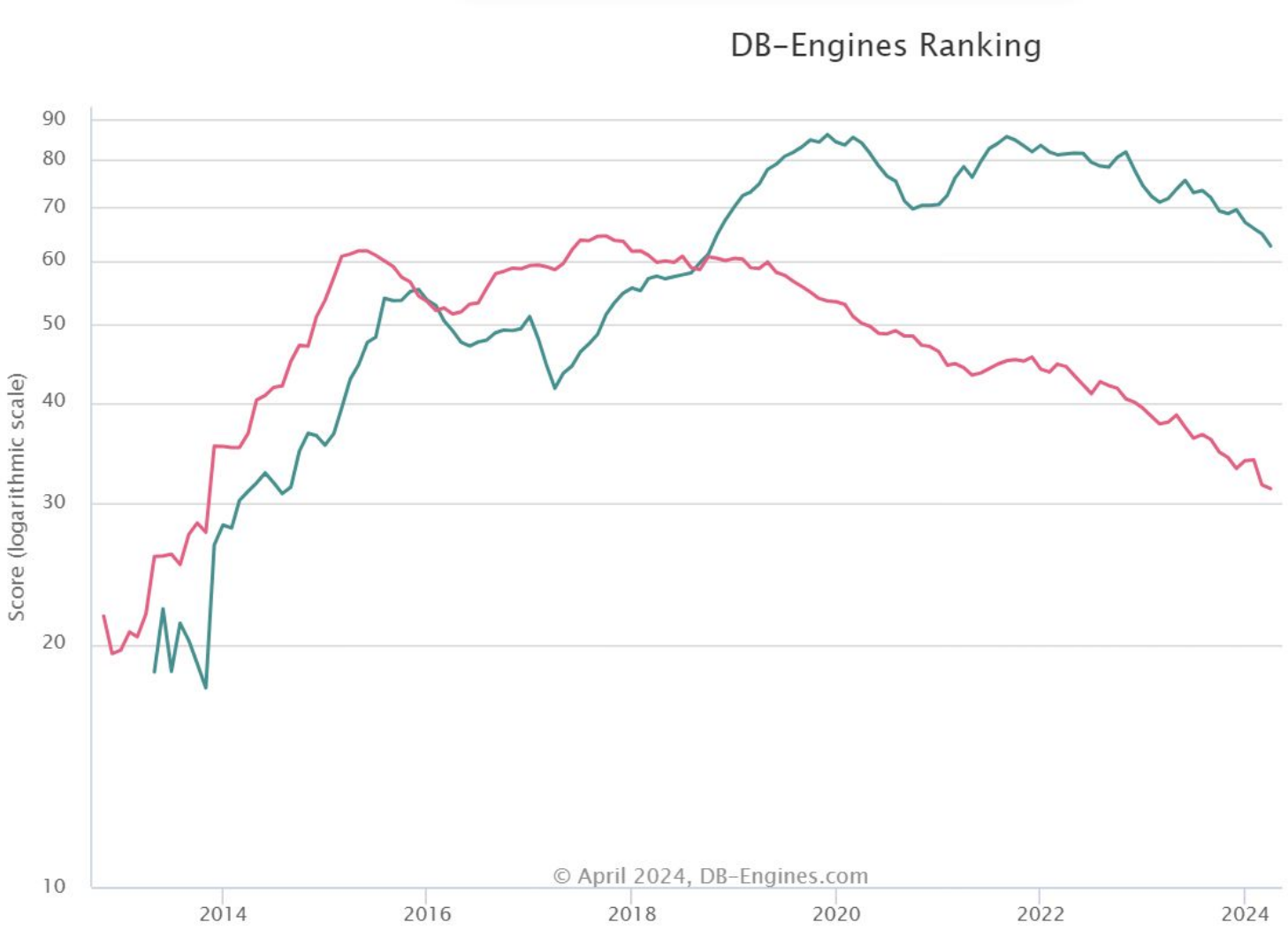
Hive (Blue) and HBase



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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

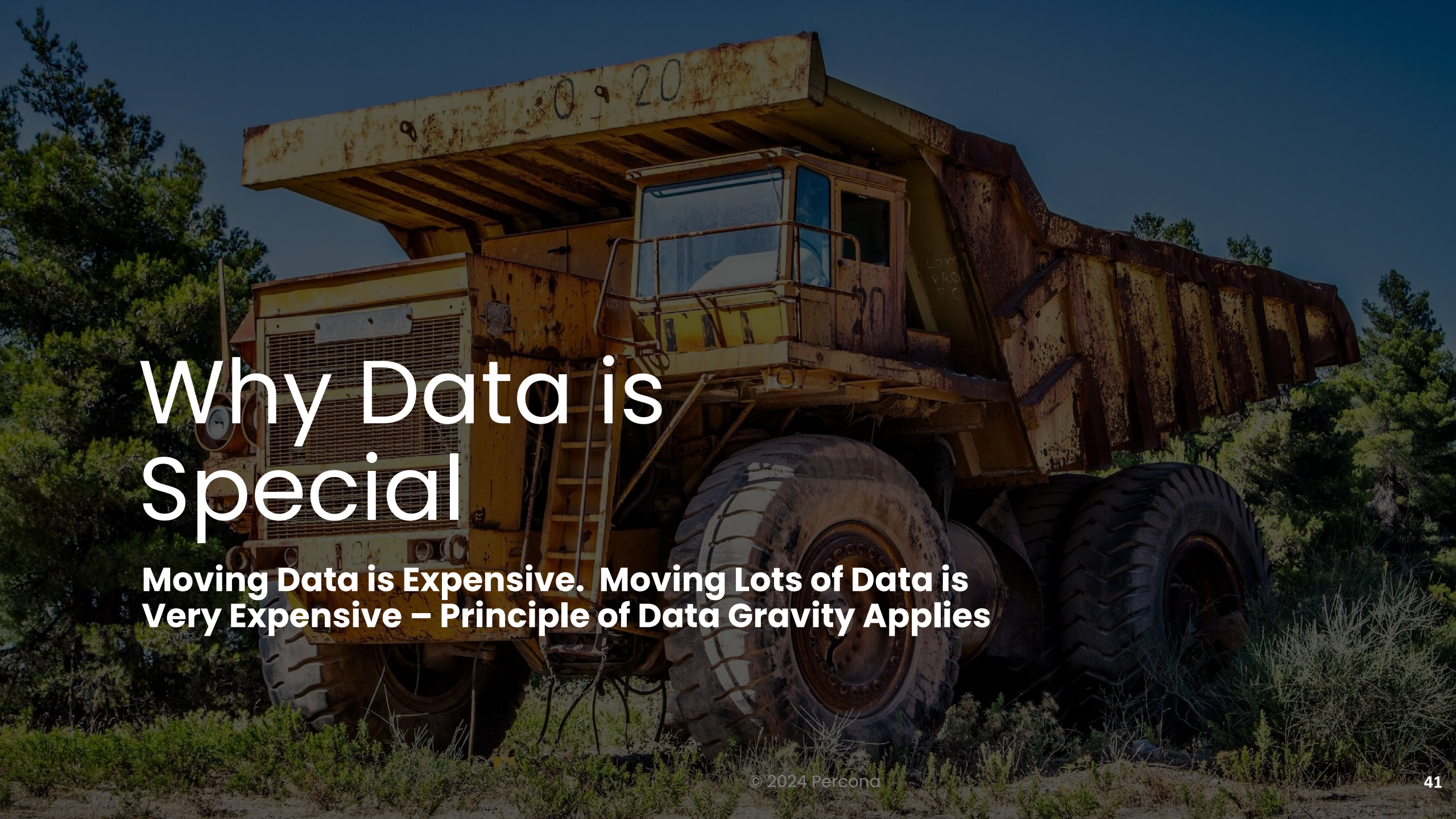
Using DBaaS is a very different skill compared to rolling your own database setup

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

Not All Is Lost

Have We Been Here Before?

2000s

2020s

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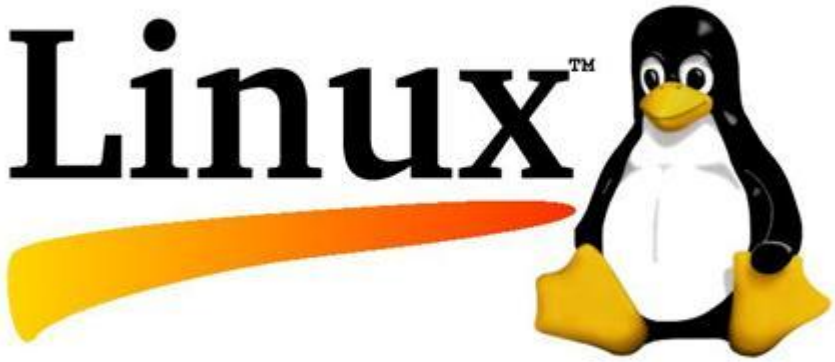
Operating Systems



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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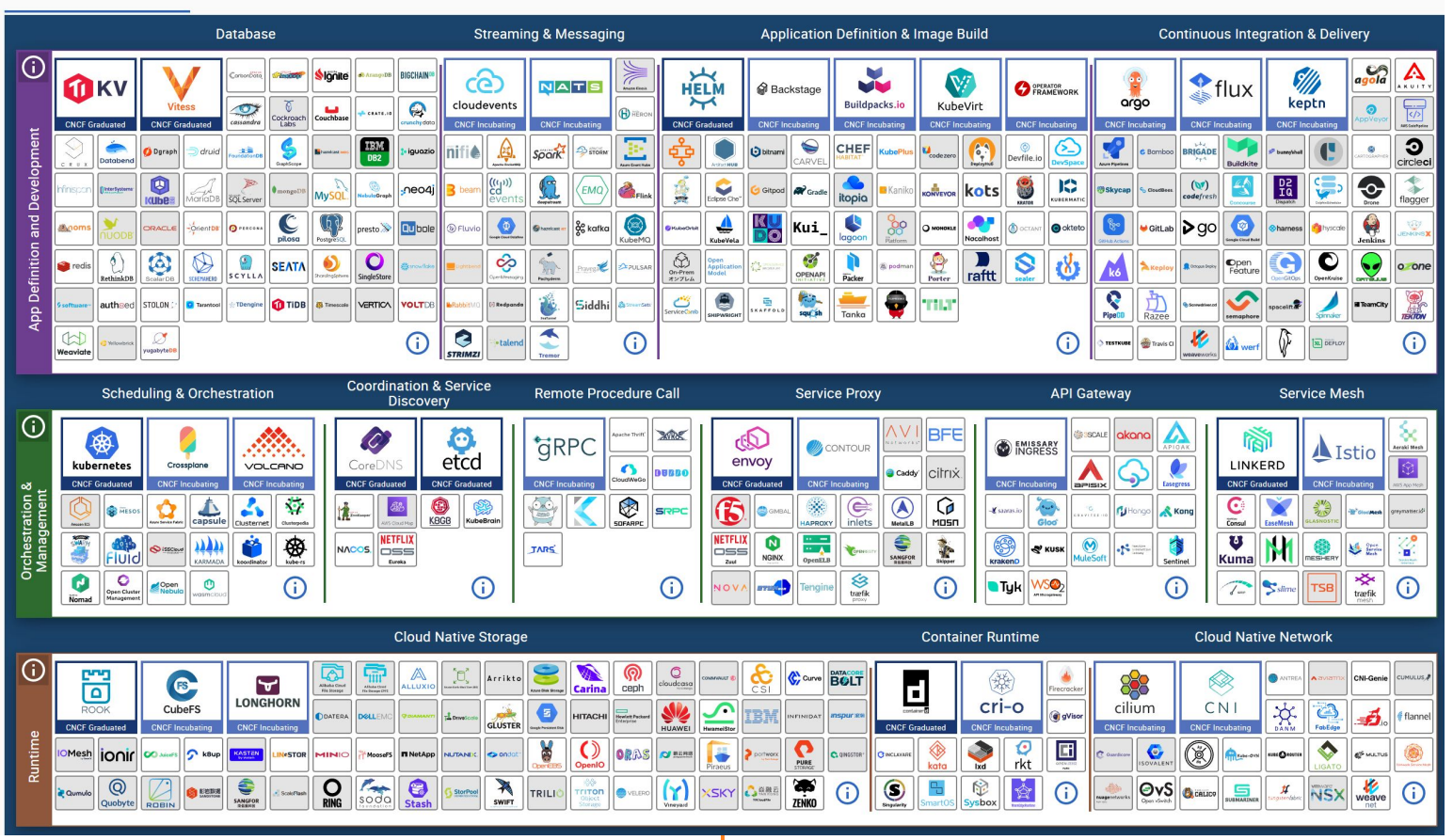
Cloud Native is Going Strong



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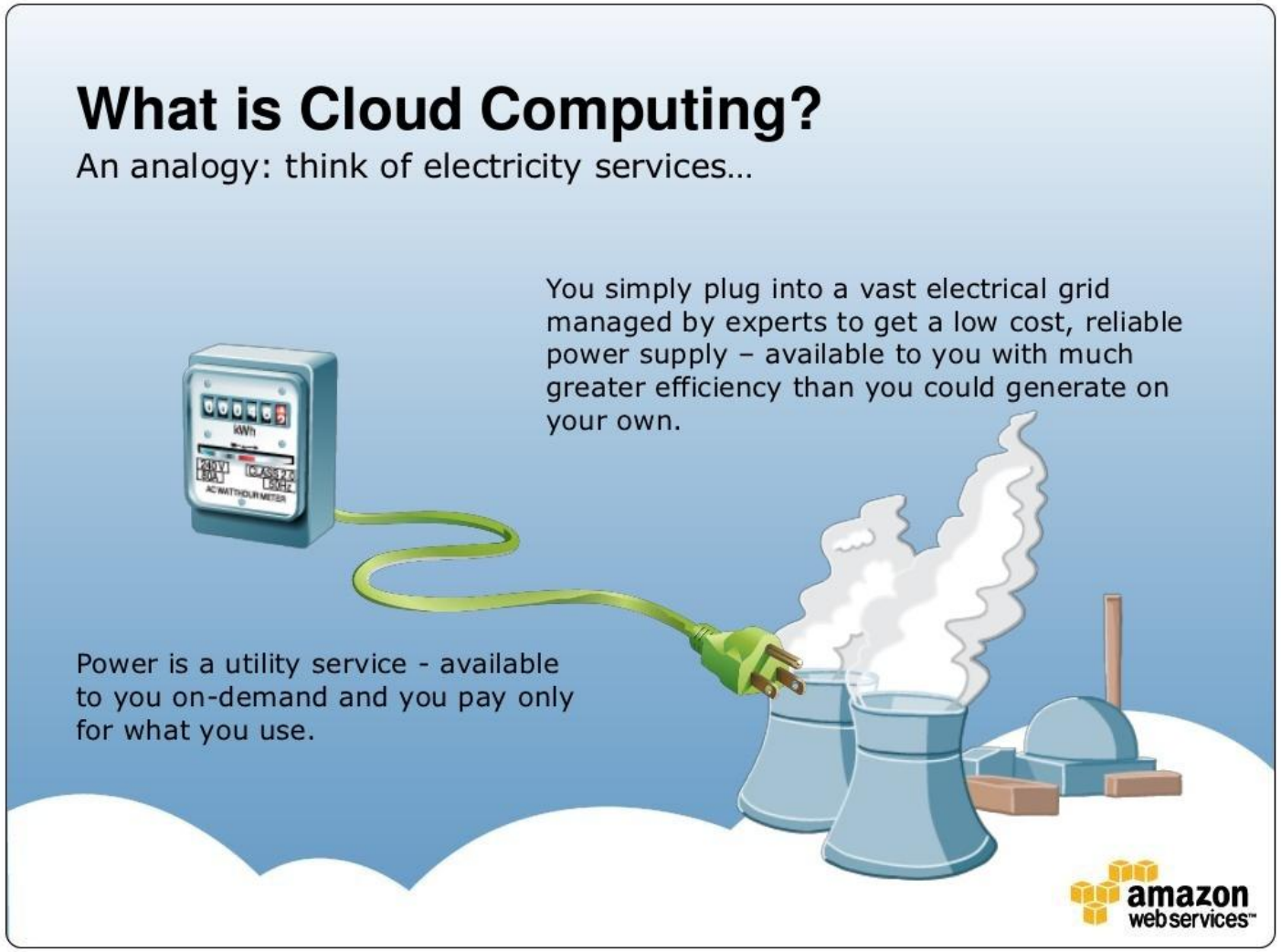
Giving Cloud Its Originally Intended Role of Commodity Infrastructure



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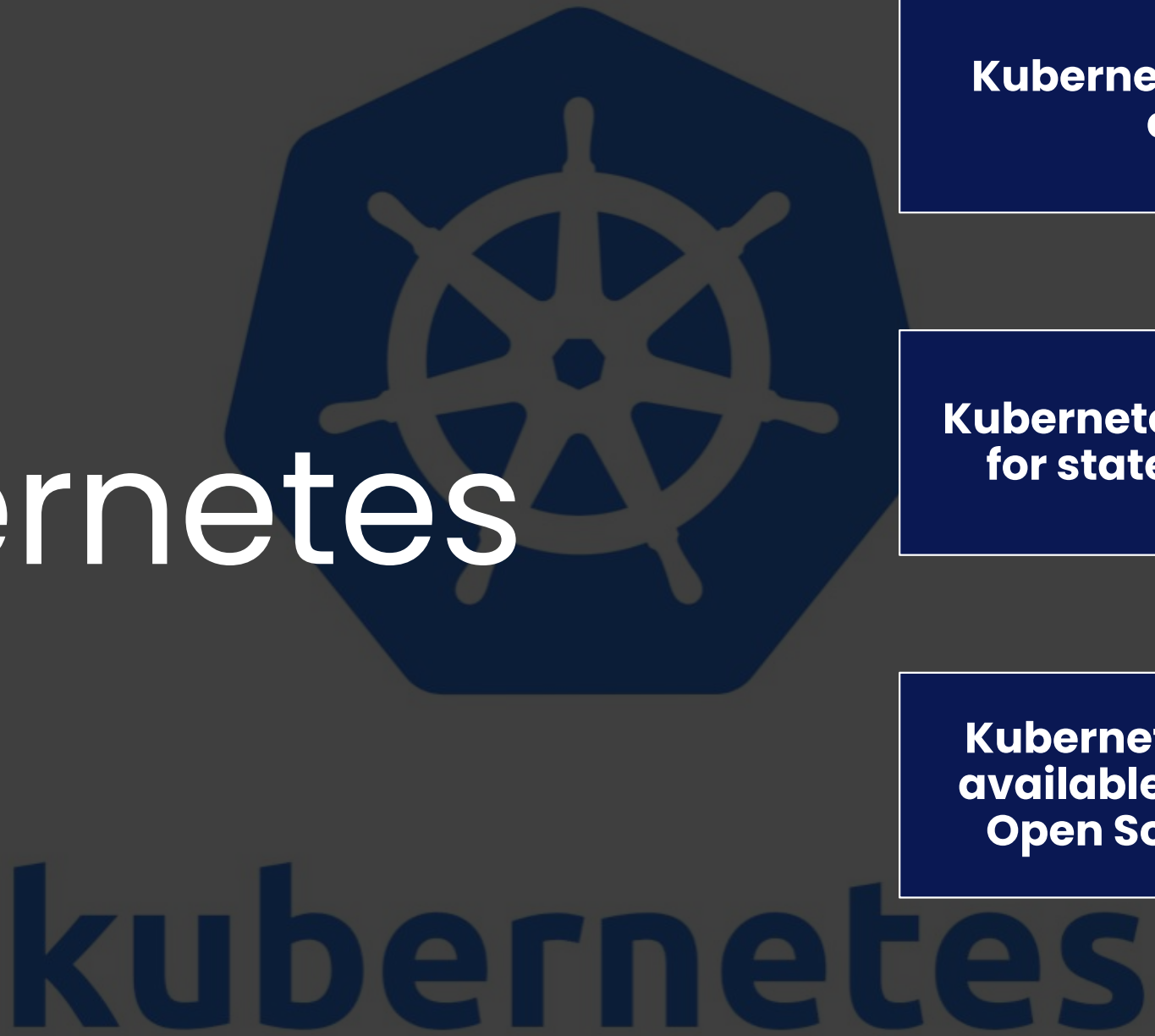
Kubernetes

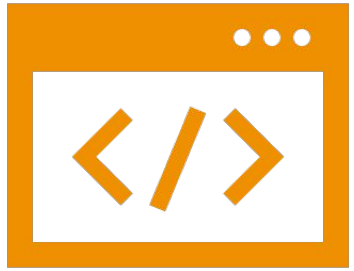


Kubernetes is universally available

Kubernetes is getting better for stateful applications

Kubernetes Operators are available for most popular Open Source Databases

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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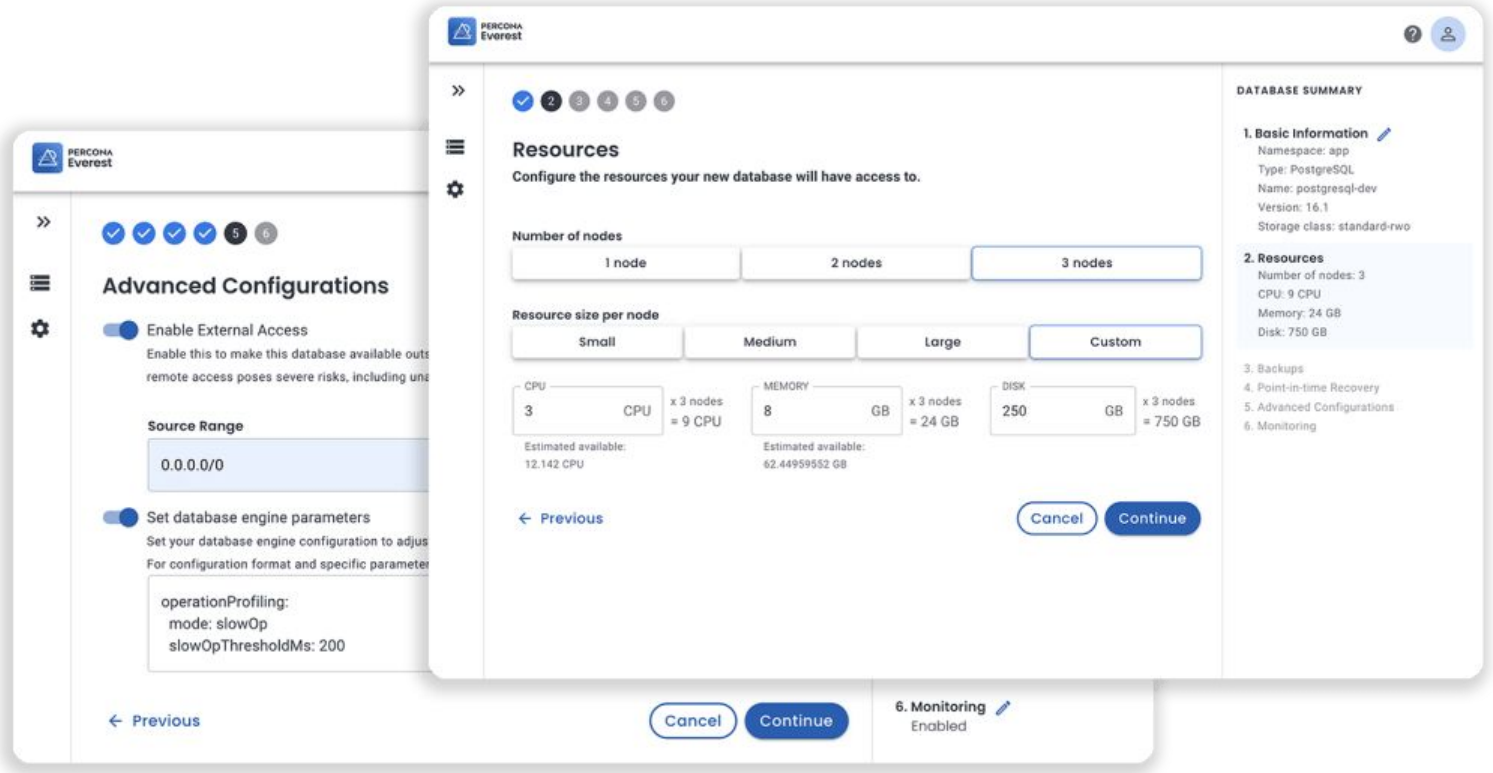
Open Source DBaaS Experience with Percona Everest



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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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