

Moving MongoDB Workloads to Postgres with FerretDB

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PERCONA
UNIVERSITY



MongoDB: The Good Parts

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- Great developer experience

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- Good drivers

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- Great developer experience
- Good drivers
- Great community (back in the day)

MongoDB: The Bad Parts

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- Reliability, performance, scalability
- Does too much?



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- Reliability, performance, scalability
- Does too much?
- Company loses money



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MongoDB: The Bad Parts

- Reliability, performance, scalability
- Does too much?
- Company loses money
- All-in on Atlas
- License change



Not a legal advice



AGPL v3

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- «If you modify the Program»

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- «All users interacting with it remotely through a computer network»

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- «If you modify the Program»
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- «Corresponding Source»

AGPL v3

- «If you modify the Program»
- «All users interacting with it remotely through a computer network»
- «Corresponding Source»
- «Including scripts to control those activities»

SSPL

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- «If you make the functionality of the Program»

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- «Includes, without limitation, [...]»

SSPL

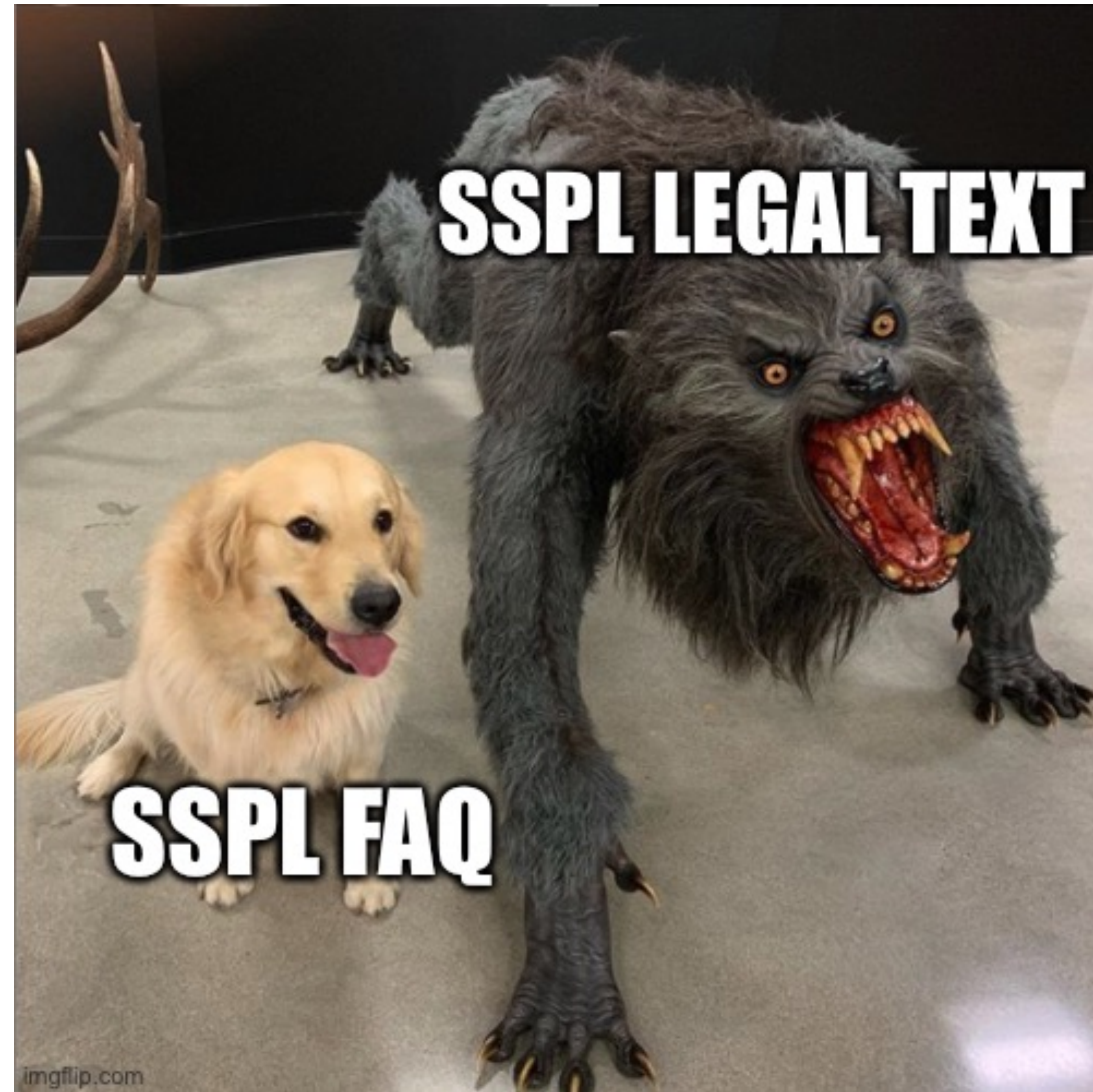
- «If you make the functionality of the Program»
- «Available to third parties as a service»
- «Includes, without limitation, [...]»
- «Service Source Code»

SSPL

- «If you make the functionality of the Program»
- «Available to third parties as a service»
- «Includes, without limitation, [...]»
- «Service Source Code»
- «Including, without limitation, management software, user interfaces, application program interfaces, [...], all such that a user could run an instance of the service»

SSPL FAQ

SSPL FAQ





**open source
initiative[®]**

**[https://opensource.org/
sspl-not-open-source](https://opensource.org/sspl-not-open-source)**

Protocol specification license

```
15 + .. note::
16 +
17 + This MongoDB Wire Protocol Specification is licensed under a
18 + `Creative Commons Attribution-NonCommercial-ShareAlike 3.0 United States License
19 + <https://creativecommons.org/licenses/by-nc-sa/3.0/us/>`__. You may
20 + not use or adapt this material for any commercial purpose, such as
21 + to create a commercial database or database-as-a-service offering.
22 +
```

Alternatives?

Alternatives?



Amazon
DocumentDB

Alternatives?



Amazon
DocumentDB



Azure
Cosmos DB

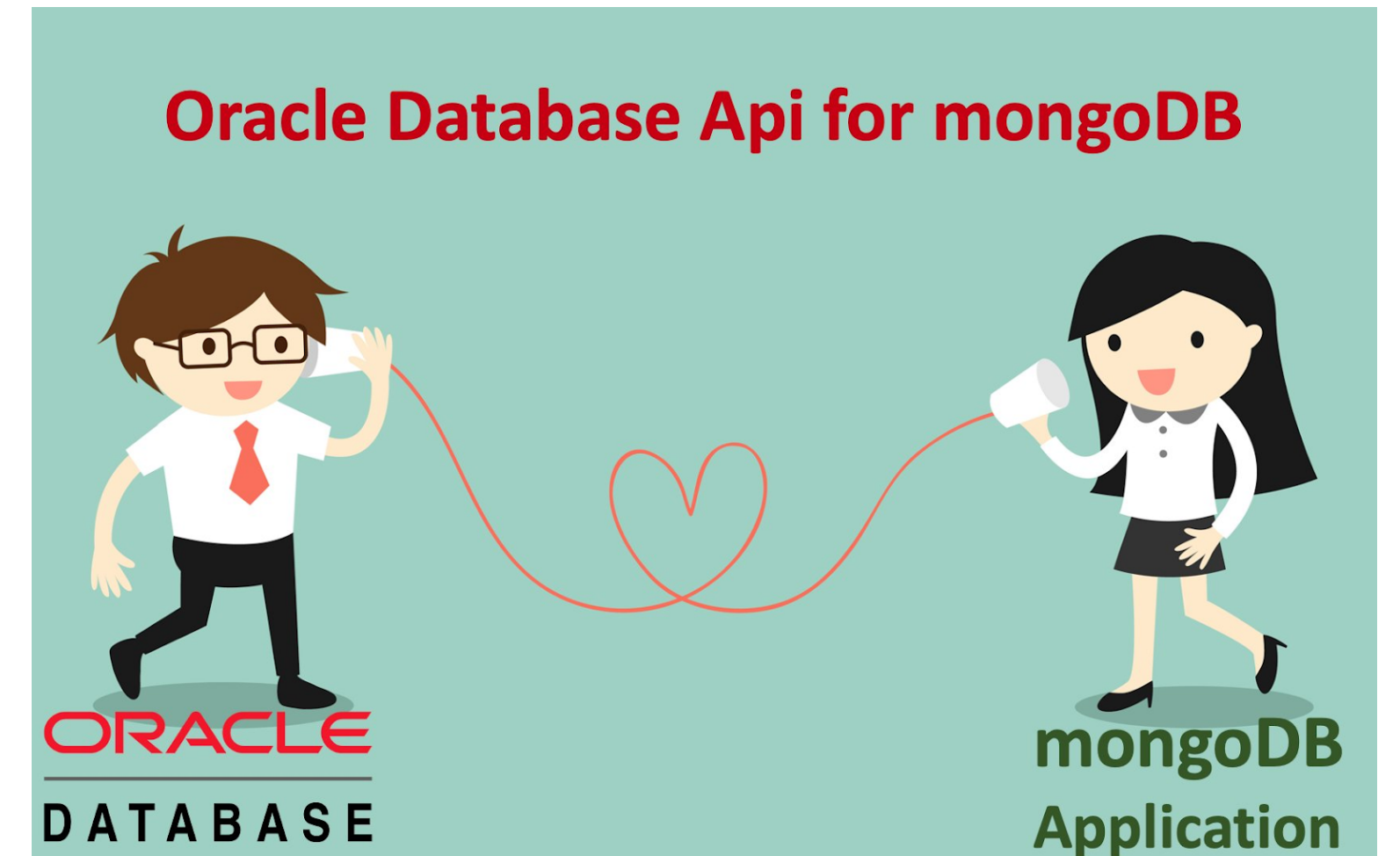
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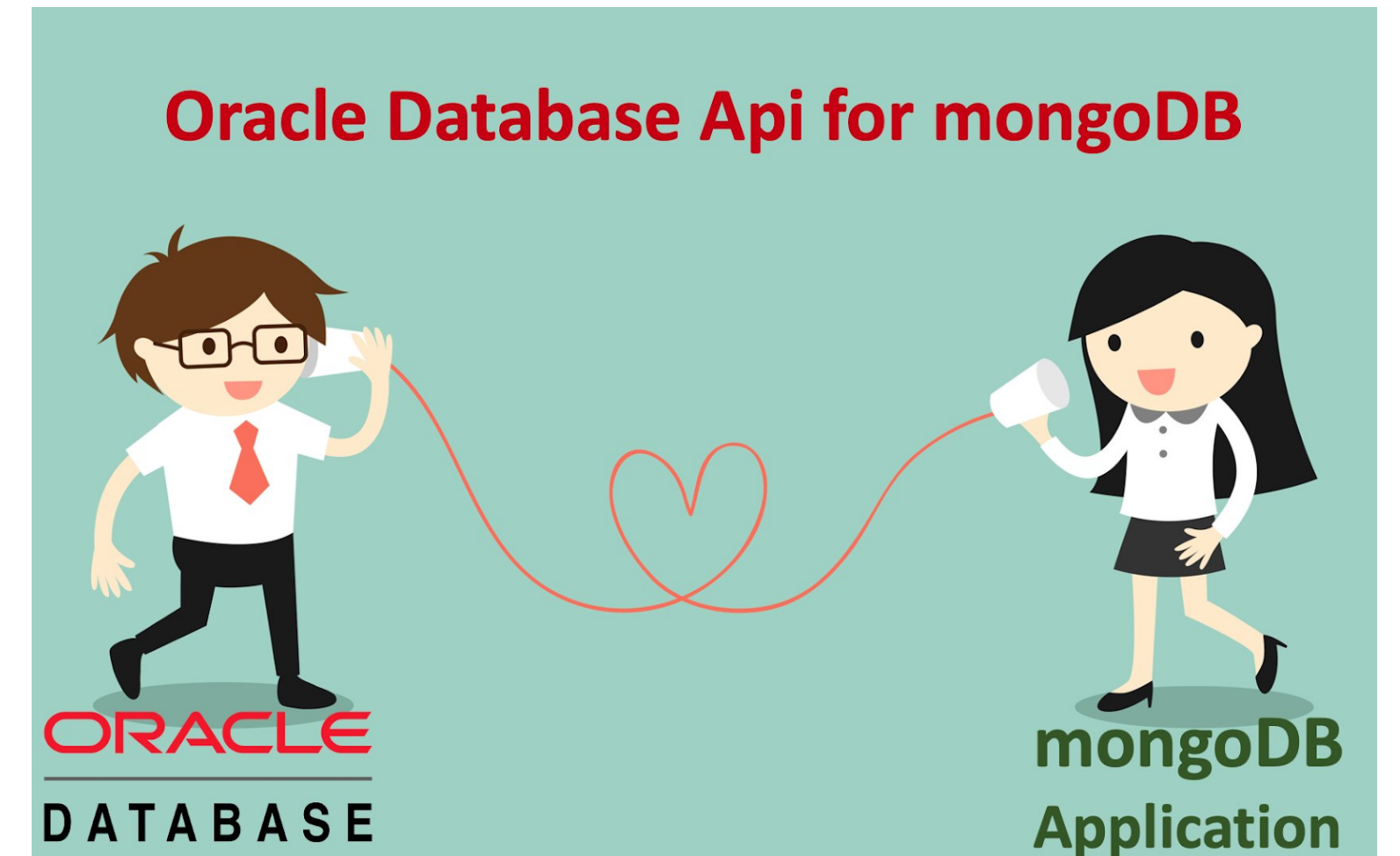
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**Informix database
software**

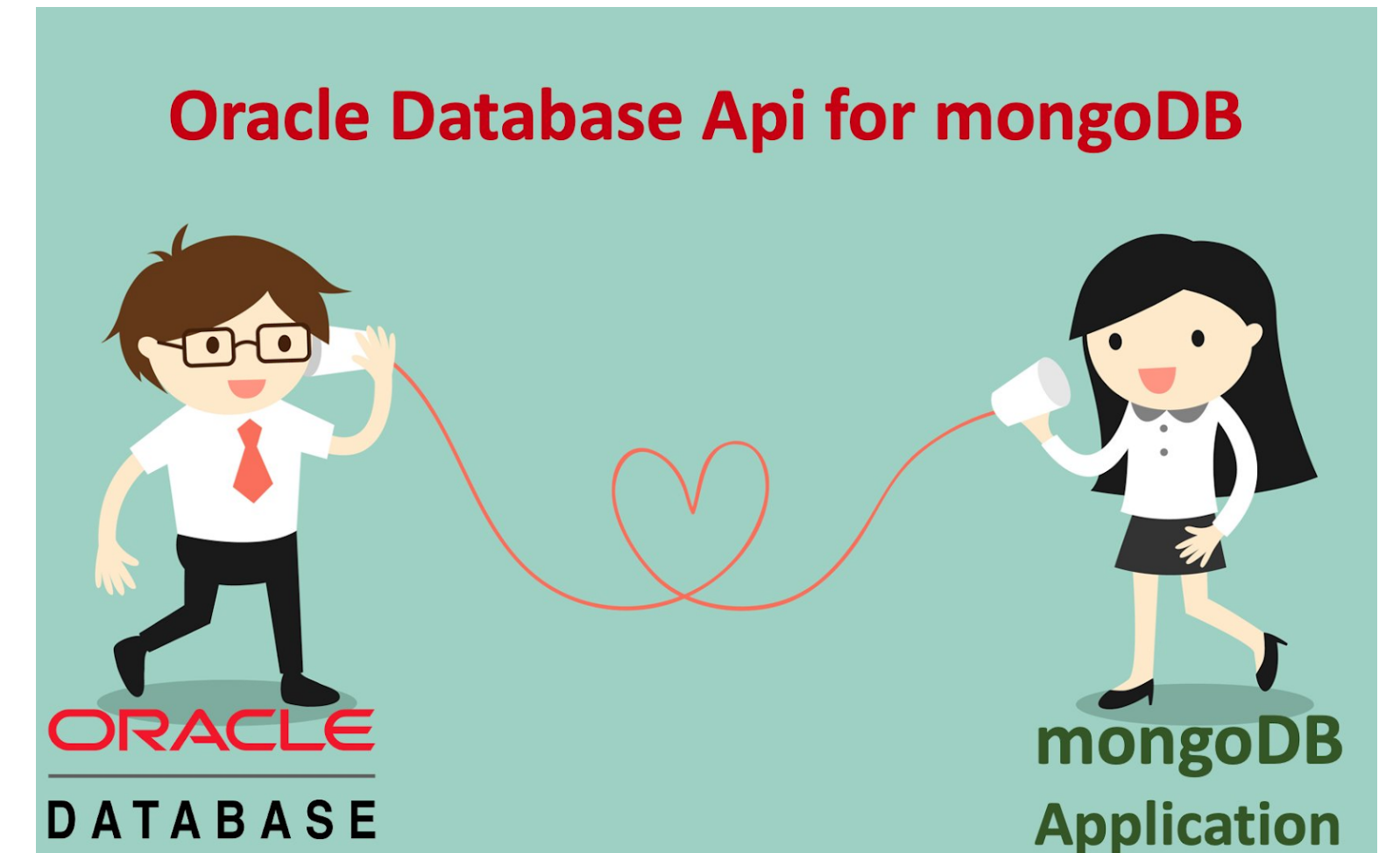
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Informix database
software

Our idea

Our idea

- Should work with unmodified MongoDB drivers and apps

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- Should not store data itself

Our idea

- Should work with unmodified MongoDB drivers and apps
- Should not store data itself
- Should be a honest open-source solution

Who are you?

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Peter Zaitsev, Advisor
Percona co-founder

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Peter Farkas, CEO
ex-Percona, Cloudera
10+ years of experience
leading database software
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Alexey Palazhchenko, CTO
ex-Percona
10+ years of experience leading
software engineering teams

FerretDB



FerretDB

- Stateless proxy for MongoDB wire protocol



FerretDB

- Stateless proxy for MongoDB wire protocol
- Stores data in PostgreSQL (or SQLite)



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FerretDB



FerretDB

- Launched 1³/₄ years ago



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- v1.5.0 released 3 days ago



FerretDB

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- Production-ready*



Why PostgreSQL?

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- Very reliable
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- Many companies run both PostgreSQL and MongoDB

Storing BSON in jsonb

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```
{
  "$s": {
    "$k": [
      "platform",
      "application"
    ]
  },
  "platform": "Node.js v14.17.3",
  "application": "mongosh 1.0.1"
}
```

Storing BSON in jsonb

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 - int32, int64, double

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 - JavaScript code
with scope

Storing BSON in jsonb

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- JavaScript code *with scope*

```
{
  "$s": {
    "p": {
      "v": {
        "t": "int"
      },
    },
  },
  "v": 42.0
}
```

Comparing BSON values

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ORDER BY v
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int32, int64, double  
string
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```
int32, int64, double  
string  
object, array
```

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- NaN < 1
- null < NaN

Comparing BSON values

- NaN < 1
- null < NaN
- [] < null

Comparing BSON values

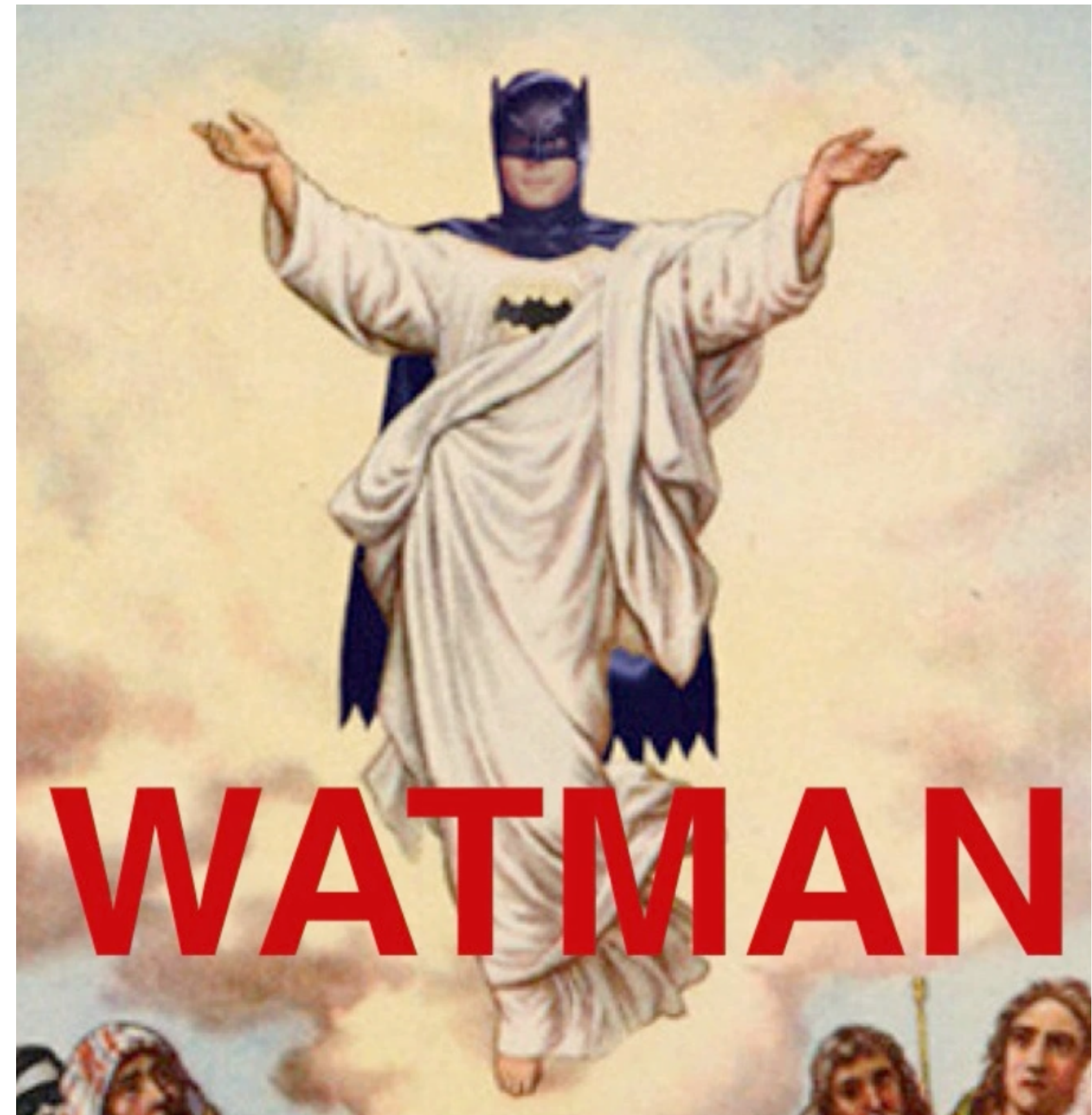
- NaN < 1
- null < NaN
- [] < null
- [] < [null]

Comparing BSON values

- NaN < 1
- null < NaN
- [] < null
- [] < [null]
- null </> [null]
(depends on sorting order)

Comparing BSON values

- $\text{NaN} < 1$
- $\text{null} < \text{NaN}$
- $[] < \text{null}$
- $[] < [\text{null}]$
- $\text{null} < /> [\text{null}]$
(depends on sorting order)



<https://www.destroyallsoftware.com/talks/wat>

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- Fetch all data

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- Add great integration tests

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 - `WHERE _jsonb->'v' = 42`

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- Use custom operators?
- Use custom data type?
- Use custom extension?

Integration tests

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- Tests of existing applications
- «MongoDB API Tester» tests
- Community testers

Community

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- Roadmap:
<https://github.com/orgs/FerretDB/projects/2>

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<https://github.com/FerretDB/FerretDB>
- And give it a try tomorrow

Questions?

- Thank you!
- Questions?
- <https://ferretdb.io/>
- <https://github.com/FerretDB>
- https://twitter.com/ferret_db
- <https://techhub.social/@ferretdb>

