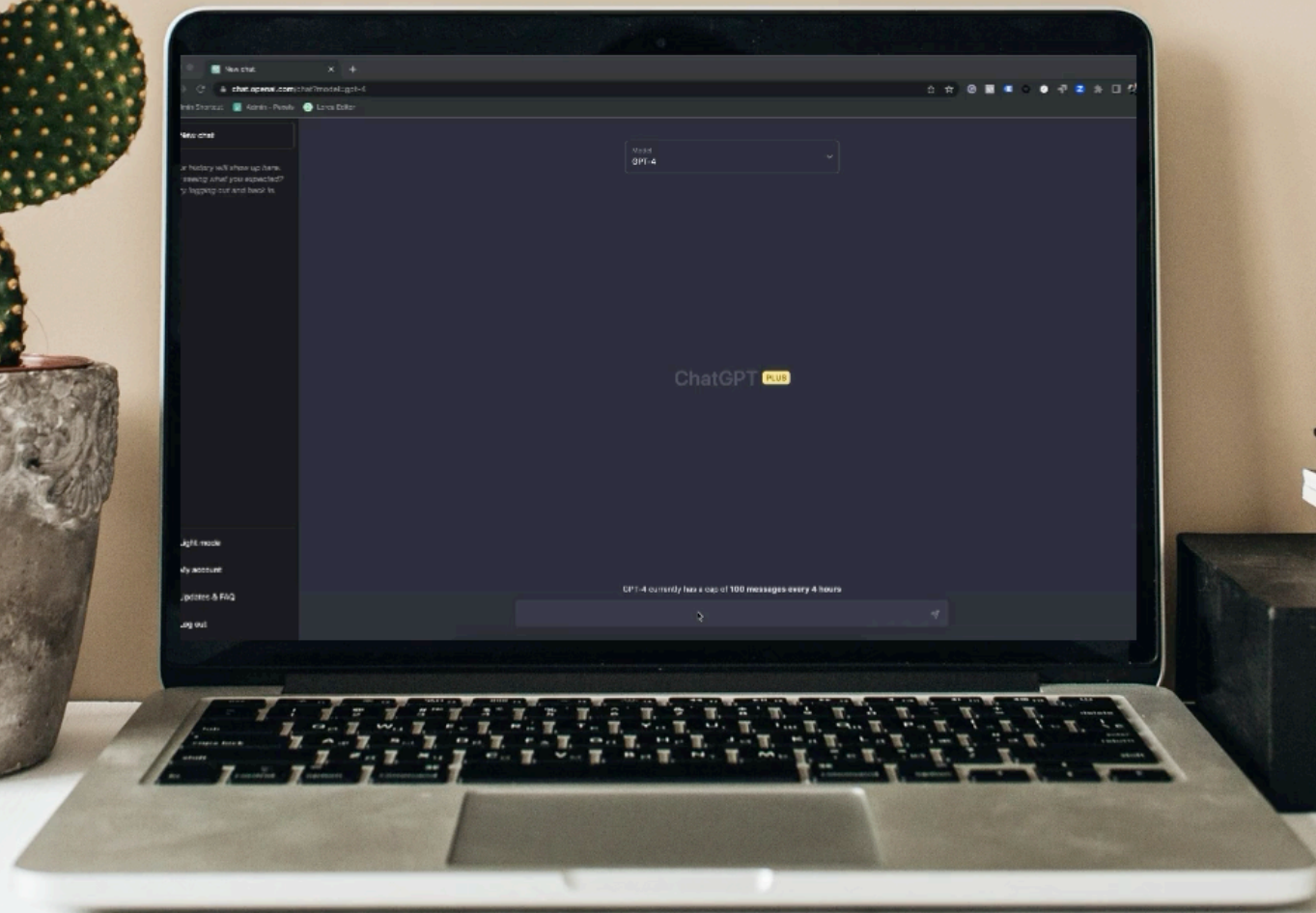


Finding PostgreSQL's fit in the AI space

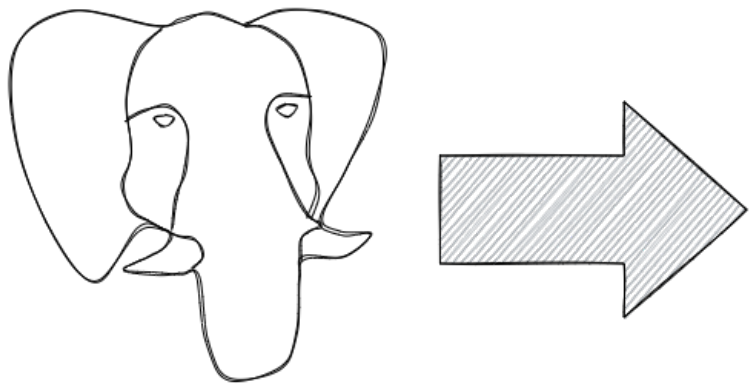
WHY???



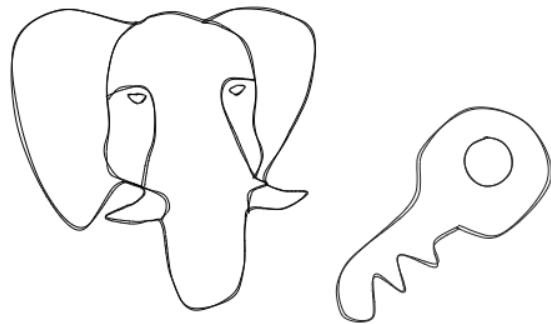




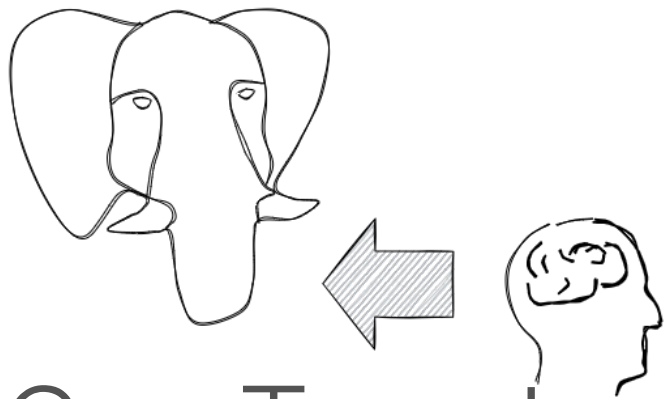
3 Acts



PG as Source

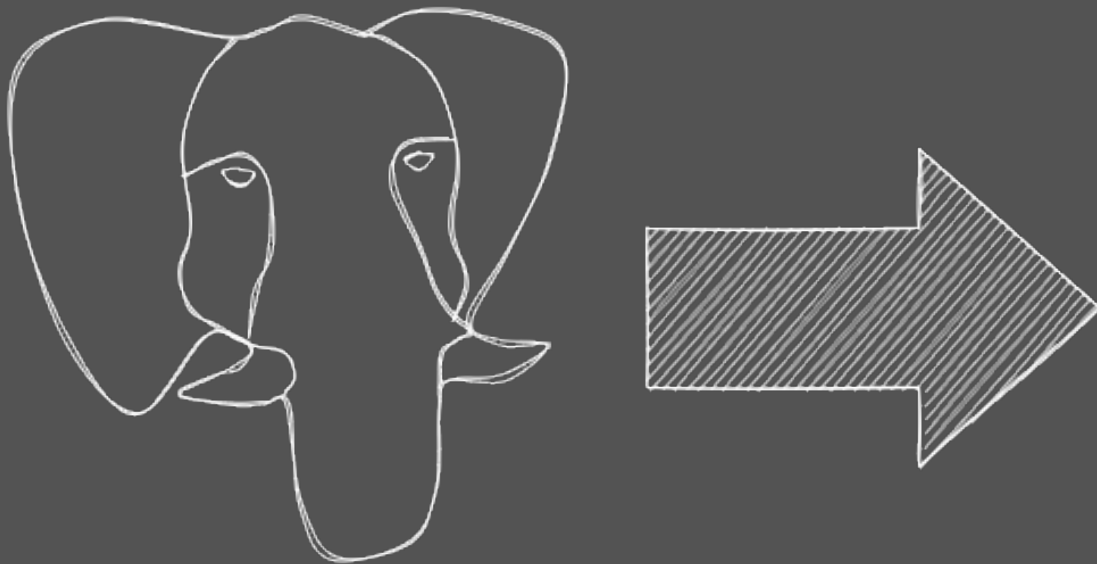


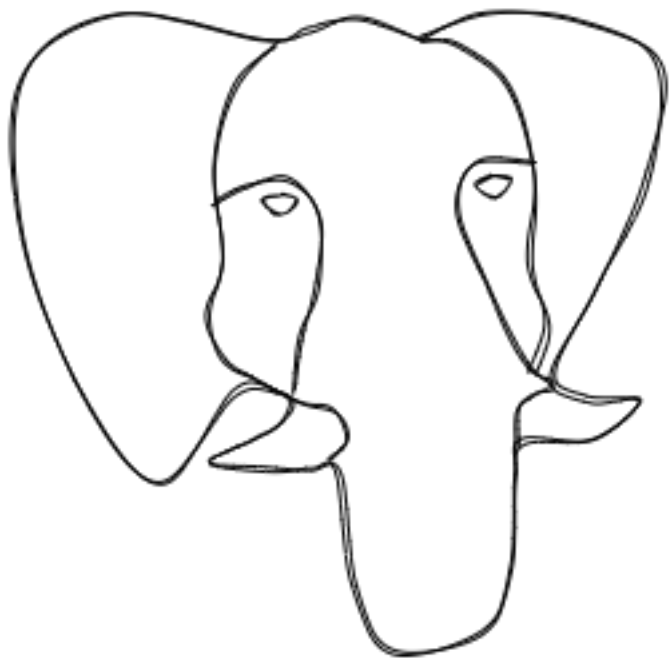
PG as key component



PG as Target

PG as Source



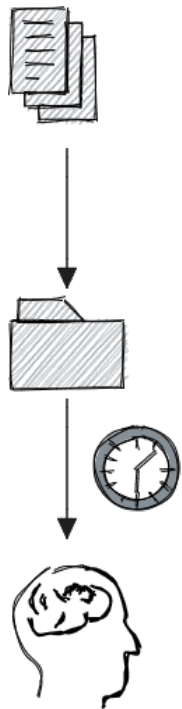


Contains data

First data touchpoint

Easy to query/integrate

Fine-Tuning



Ok I understand
your technical
documentation

Prompt Assembly

How does
product A
work?

Hi Customer AAA, I see
you had errors using
Feature X do you want
to know more?

Yes thanks

You can work on Feature
X in Product B by...





TECH

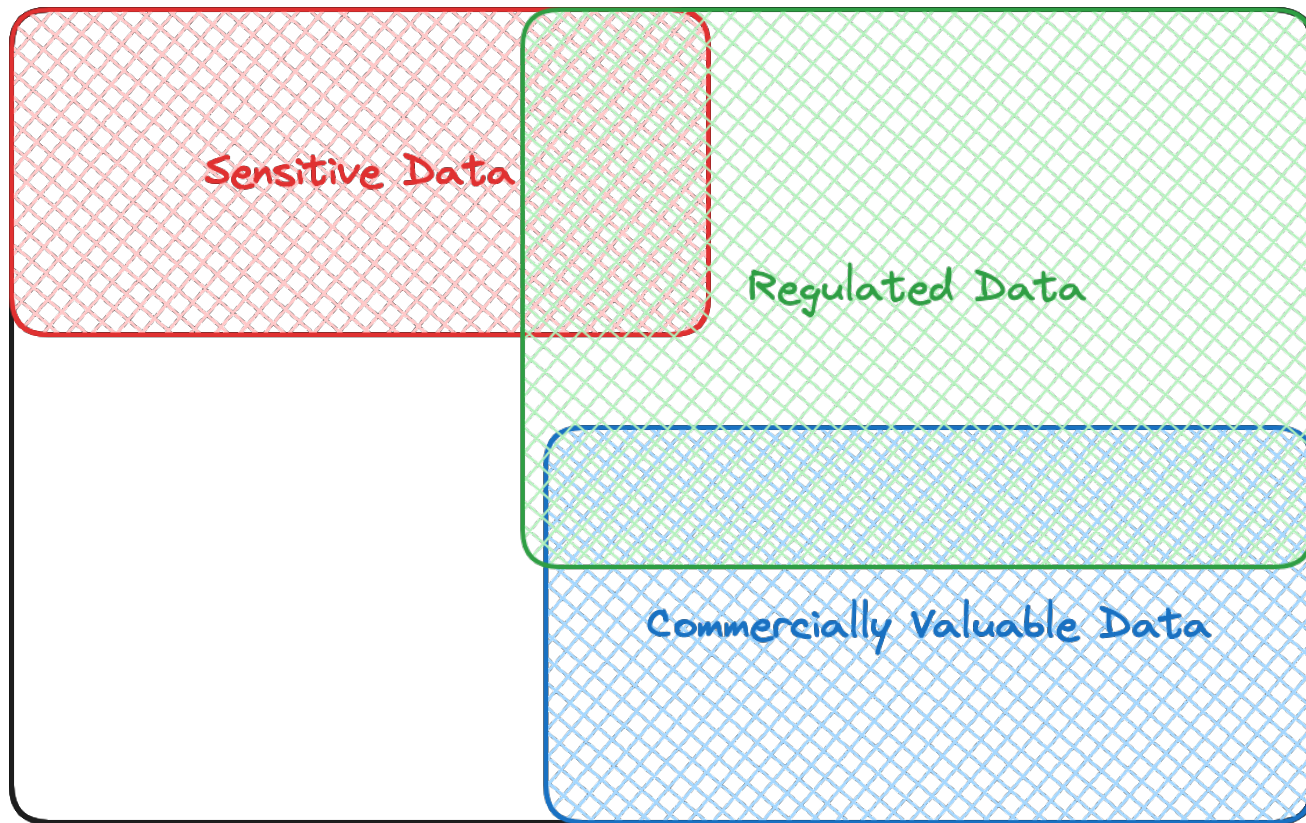
Google researchers say they got OpenAI's ChatGPT to reveal some of its training data with just one word

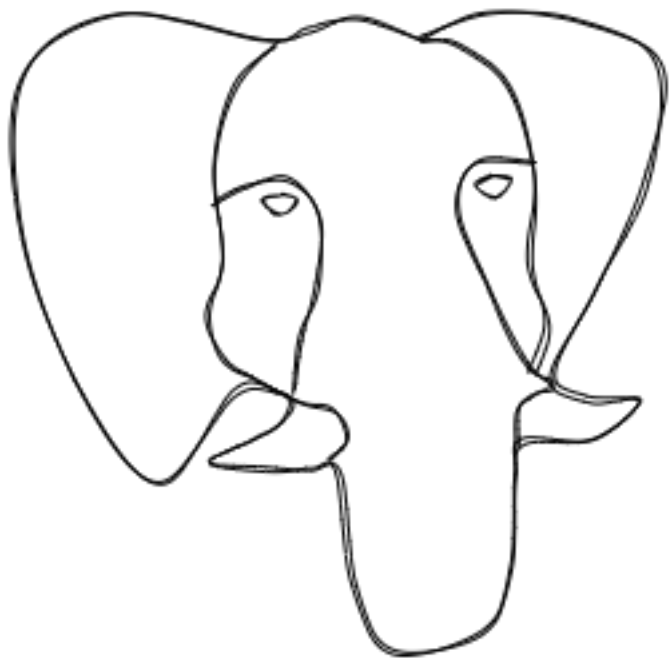
Beatrice Nolan Dec 4, 2023, 12:26 PM CET

→ Share

🔖 Save





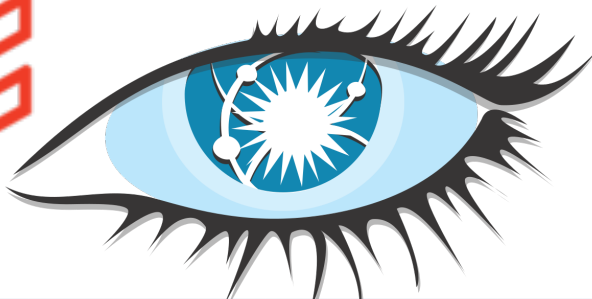
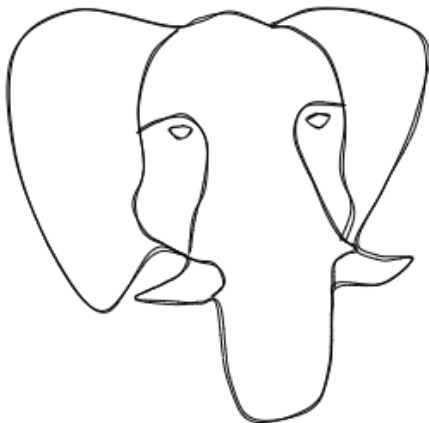
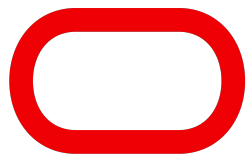
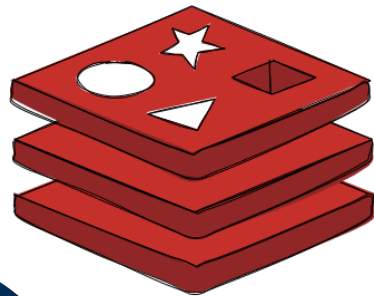


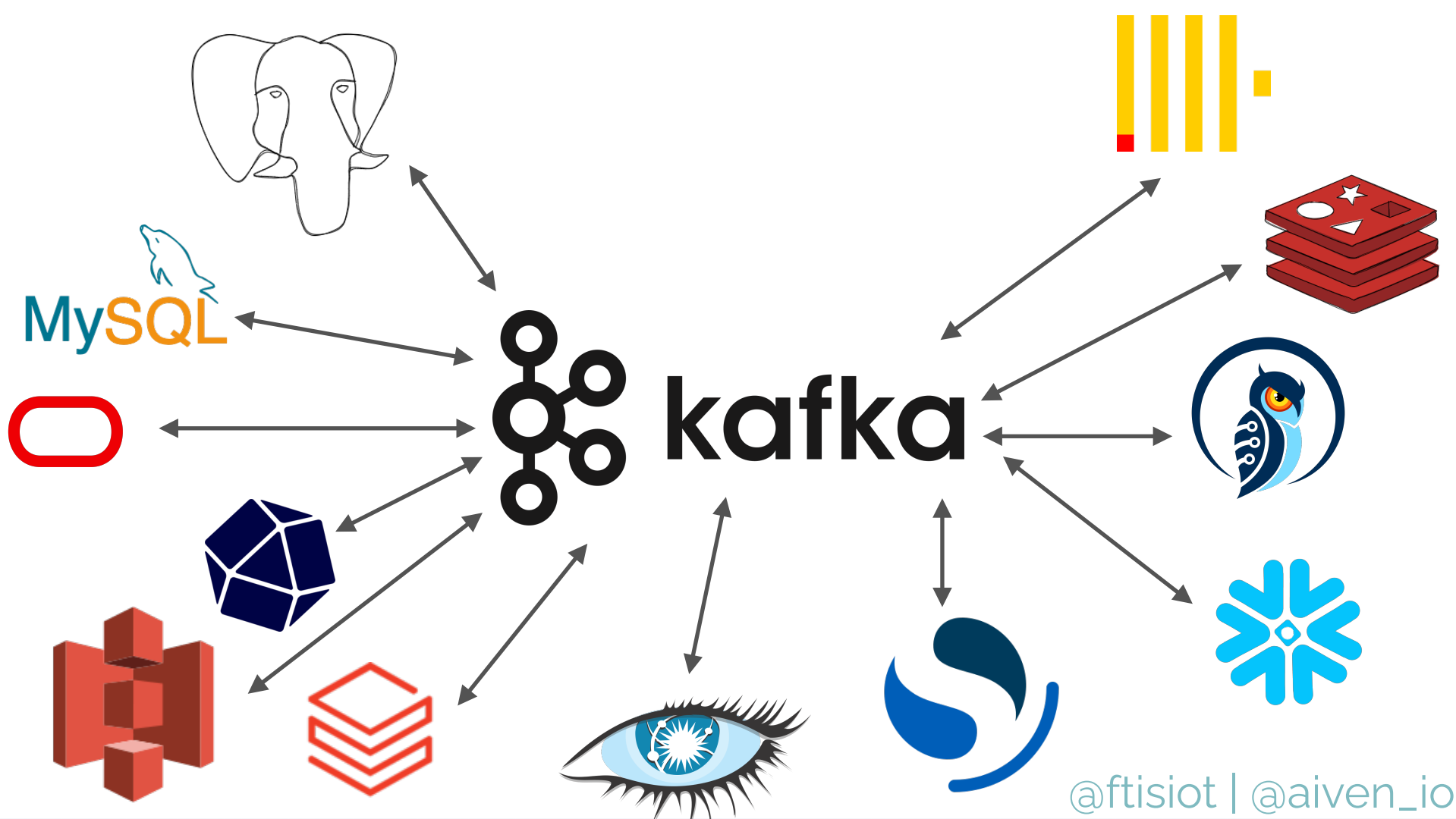
Anonymisation

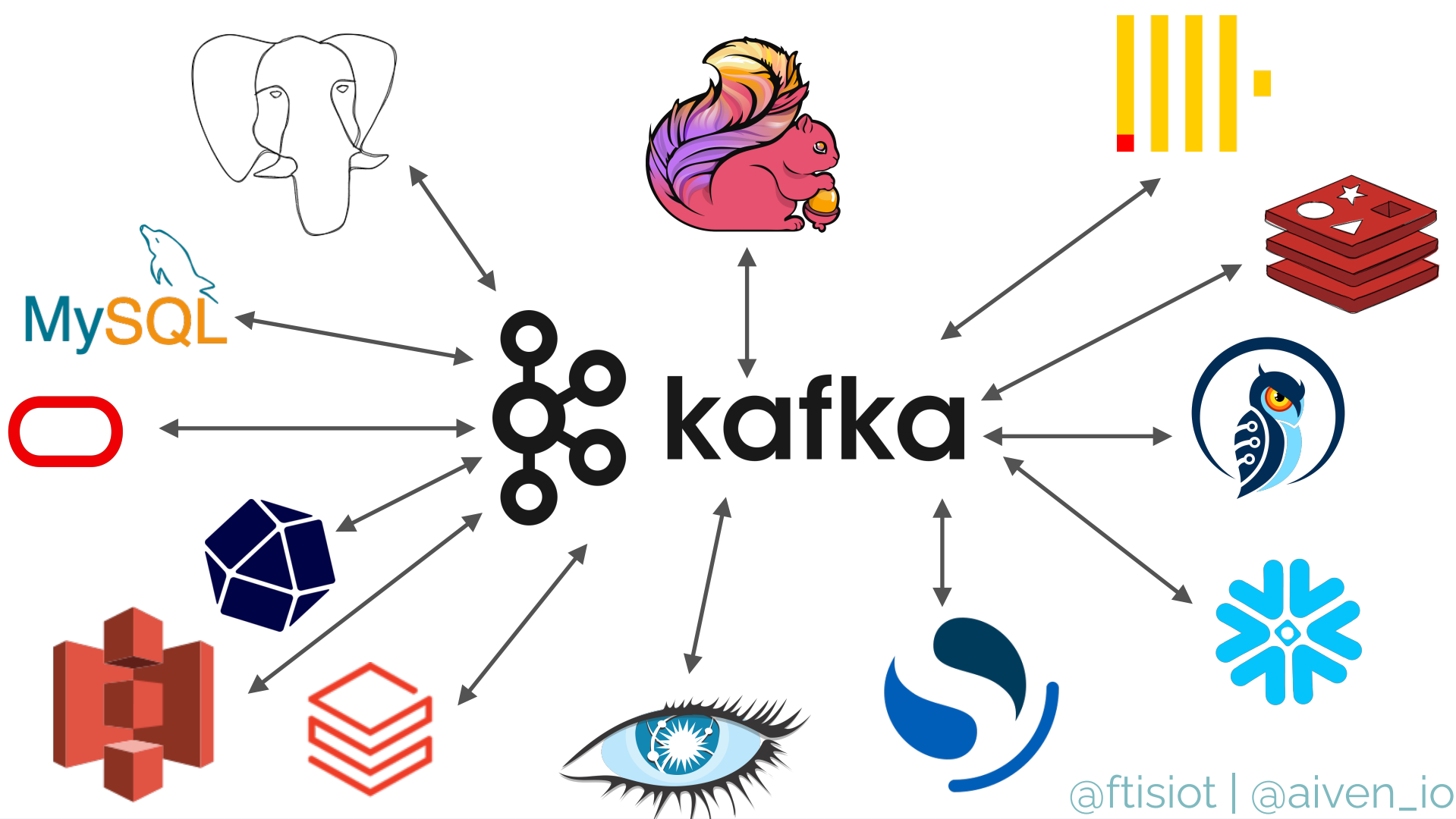
Aggregation

Masking

MySQL



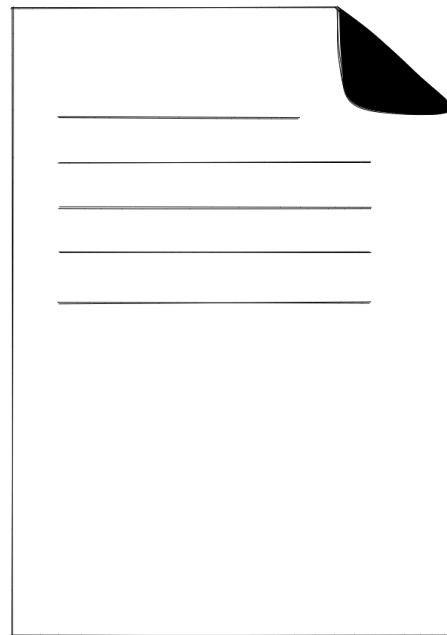




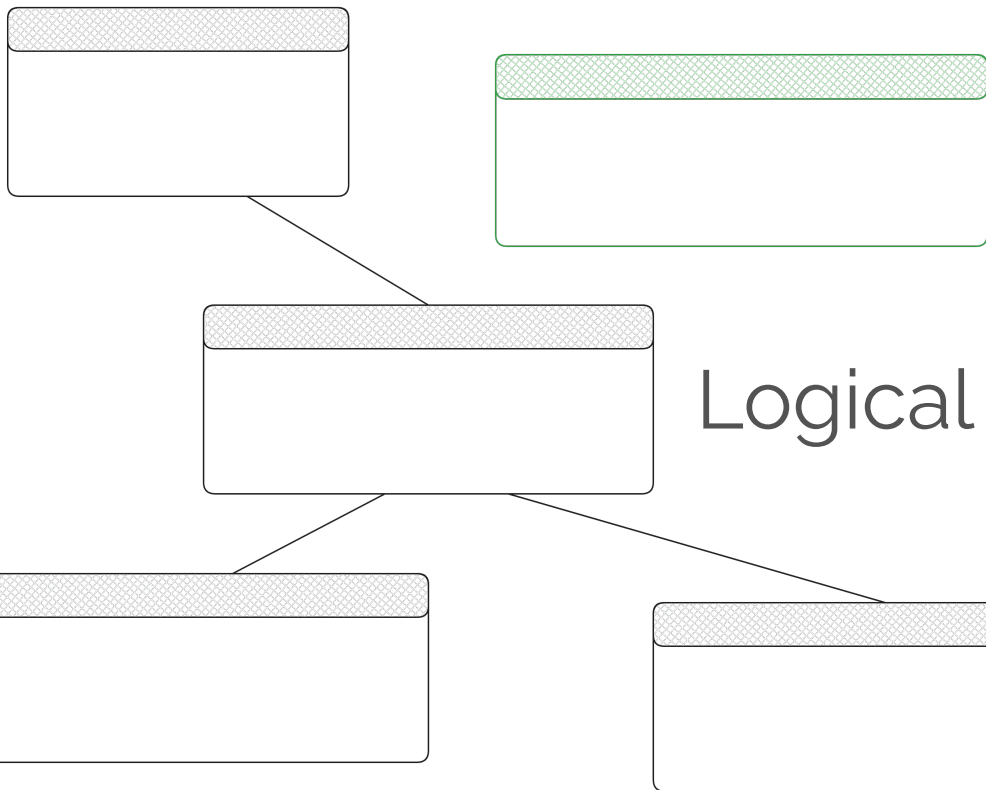
Query based



Log based



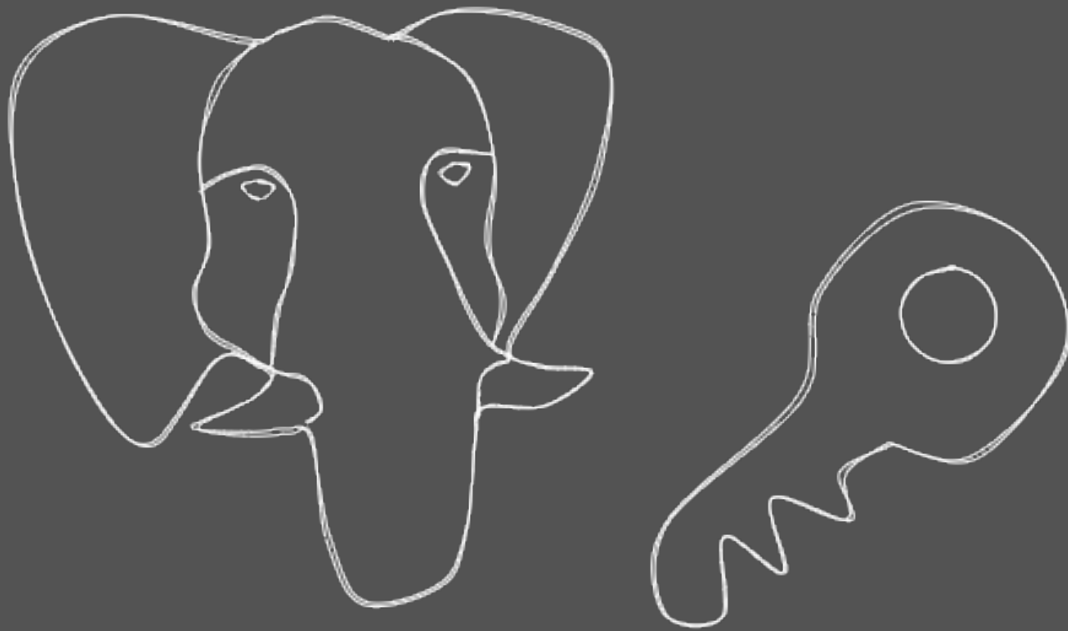
Outbox pattern

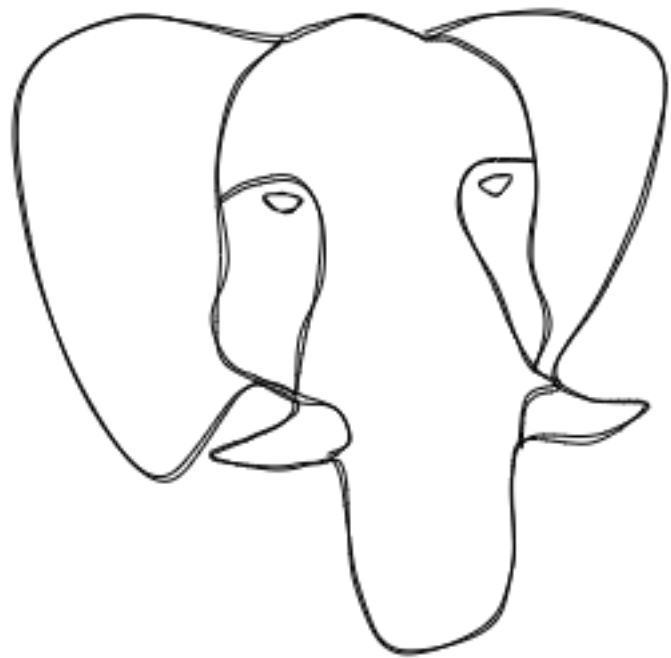


Dedicated Table

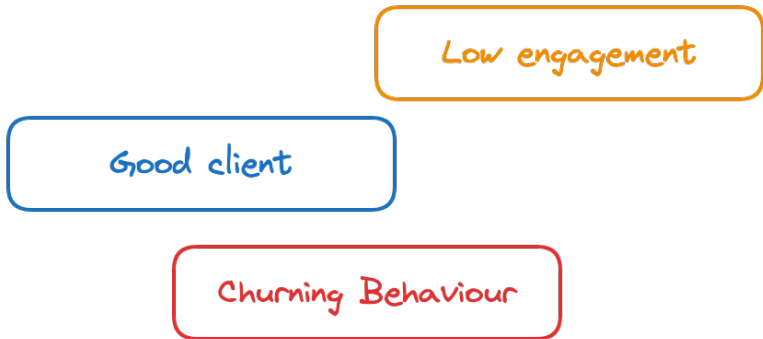
Logical decoding messages

PG as Key Component

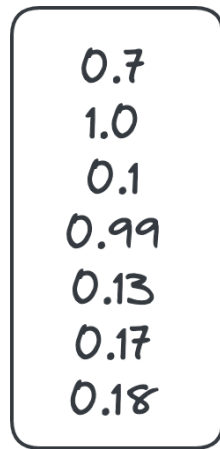




Store AI data in PG



Labels



Raw numbers

[0.1,0.544542,0.373784,0.88987,0.1111,0.42...]

Vectors

pgvector

☰ README.md

pgvector

Open-source vector similarity search for Postgres

Store your vectors with the rest of your data. Supports:

- exact and approximate nearest neighbor search
- L2 distance, inner product, and cosine distance
- any [language](#) with a Postgres client

Plus [ACID](#) compliance, point-in-time recovery, JOINS, and all of the other [great features](#) of Postgres



Installation

Compile and install the extension (supports Postgres 11+)

```
cd /tmp
git clone --branch v0.5.1 https://github.com/pgvector/pgvector.git
cd pgvector
make
make install # may need sudo
```



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

@ftisiot | @aiven_io

```
SELECT picture_name  
FROM pictures  
ORDER BY  
embedding <-> ' [1,0.6656,0.9888,...] '
```

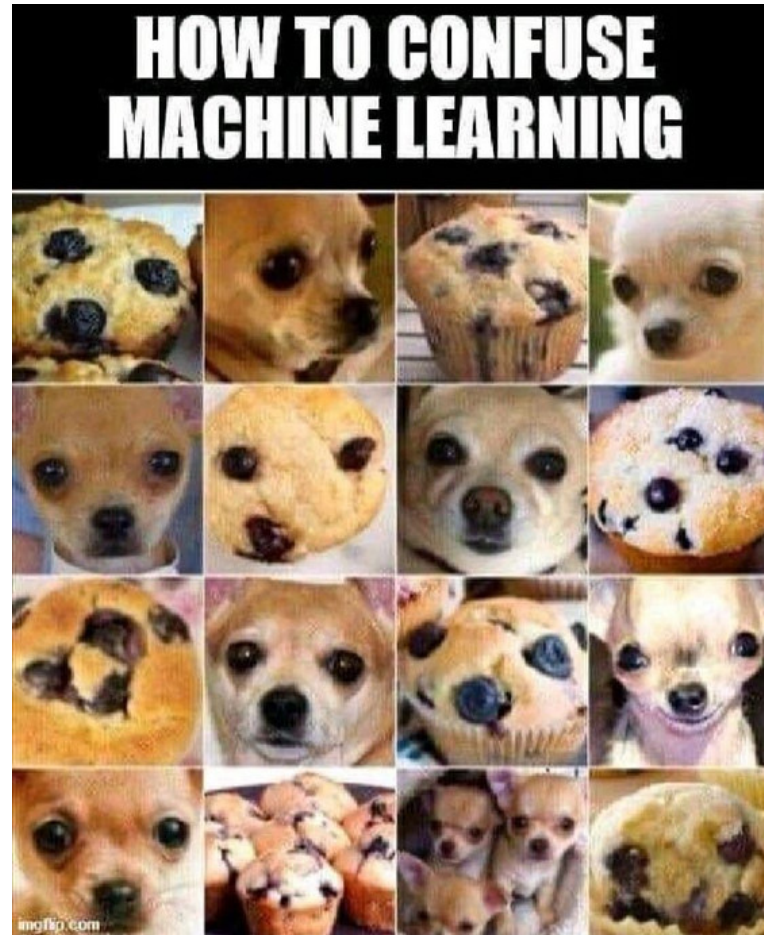
```
SELECT picture_name
FROM pictures
WHERE day='2023/04/22'
      AND event='dinner'
ORDER BY
embedding <-> ' [1,0.6656,0.9888,...] '
```

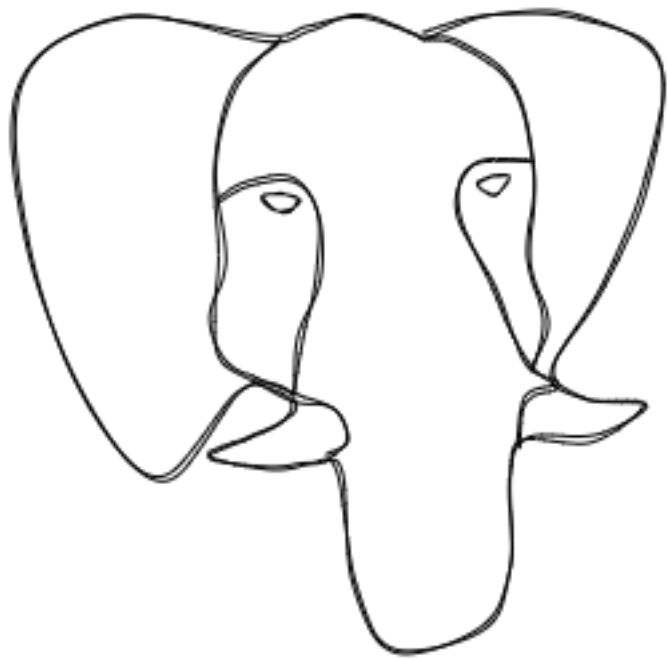



167	162	134	148	160	162	128	161	172	161	165	166
165	162	163	74	75	62	35	17	118	270	180	154
180	180	50	14	34	6	16	30	48	106	169	181
206	109	6	124	131	111	120	204	146	76	66	180
194	68	137	261	237	236	236	227	67	71	201	
172	106	267	233	233	214	220	238	228	68	74	184
188	88	179	209	185	215	211	168	139	75	30	169
189	87	165	84	50	148	134	11	31	62	22	148
199	168	191	193	156	227	178	143	182	106	36	190
205	174	165	252	236	231	149	178	228	40	95	234
193	216	136	145	236	147	66	160	75	58	218	241
199	234	147	198	227	216	127	100	36	161	265	234
190	214	173	46	193	143	34	80	2	169	249	214
187	196	235	75	1	81	47	0	6	217	265	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218

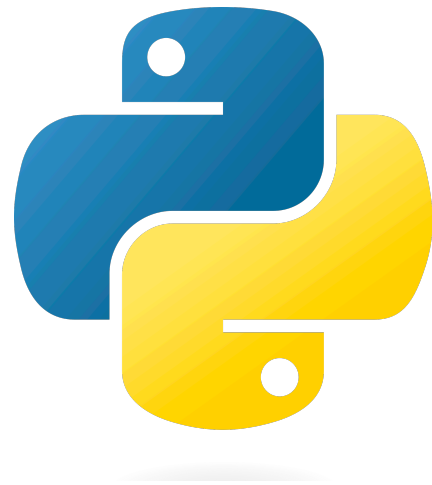
167	162	134	148	160	162	128	161	172	161	165	166
165	162	163	74	75	62	35	17	118	270	180	154
180	180	50	14	34	6	16	30	48	106	169	181
206	109	6	124	131	111	120	204	146	76	66	180
194	68	137	261	237	236	236	227	67	71	201	
172	106	267	233	233	214	220	238	228	68	74	206
188	88	179	209	185	215	211	168	139	75	39	169
189	87	165	84	50	148	134	11	31	62	22	148
199	168	191	193	156	227	178	143	182	106	36	190
205	174	165	252	236	231	149	178	228	40	95	234
190	216	136	145	236	147	66	160	75	58	218	241
199	234	147	198	227	216	127	100	36	161	265	234
190	214	173	46	193	143	34	80	2	169	249	214
187	196	235	75	1	81	47	0	6	217	265	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218







AI in PG



plpython3u



PostgresML

Generative AI and Simple ML with [PostgreSQL](#)

tests passing chat 67 online

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 - [Translation](#)
 - [Summarization](#)
 - [Question Answering](#)
 - [Text Generation](#)
 - [Text-to-Text Generation](#)
 - [Fill-Mask](#)
- [Vector Database](#)

```
SELECT pgml.transform(  
  task    => 'text-classification',  
  inputs => ARRAY[  
    'I love how amazingly simple ML has become!',  
    'I hate doing mundane and thankless tasks. 😞'  
  ]  
) AS positivity;
```

positivity

```
[  
  {"label": "POSITIVE", "score": 0.9995759129524232},  
  {"label": "NEGATIVE", "score": 0.9903519749641418}  
]
```

AI in database... or not?

Move Compute where Data is

No Data Movement

No Stale Data

Security

Reuse of existing skills

Increased variety of workloads

Move Data where Compute is

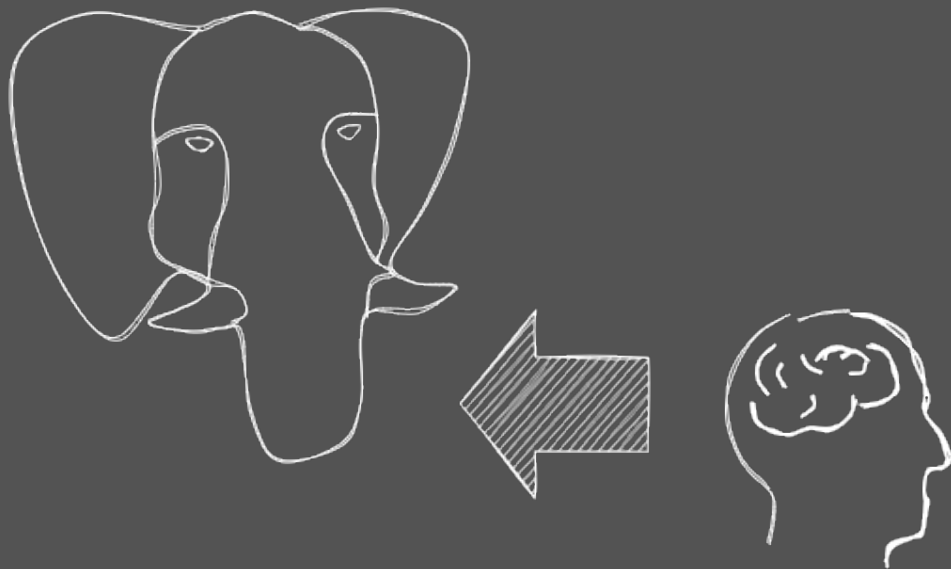
More choice of tooling

Different compute needs

Data scientist are usually NOT in DB

Separation of concerns

PG as Target



AI as productivity assistant



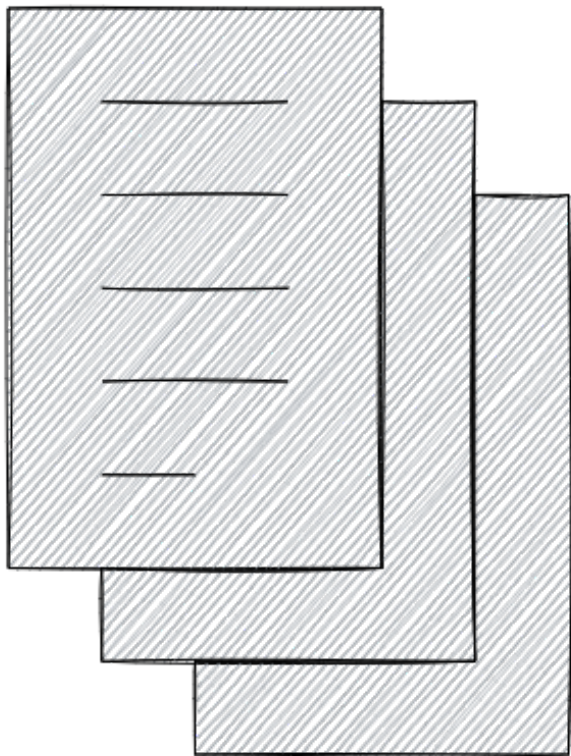
Developer

From text to Query

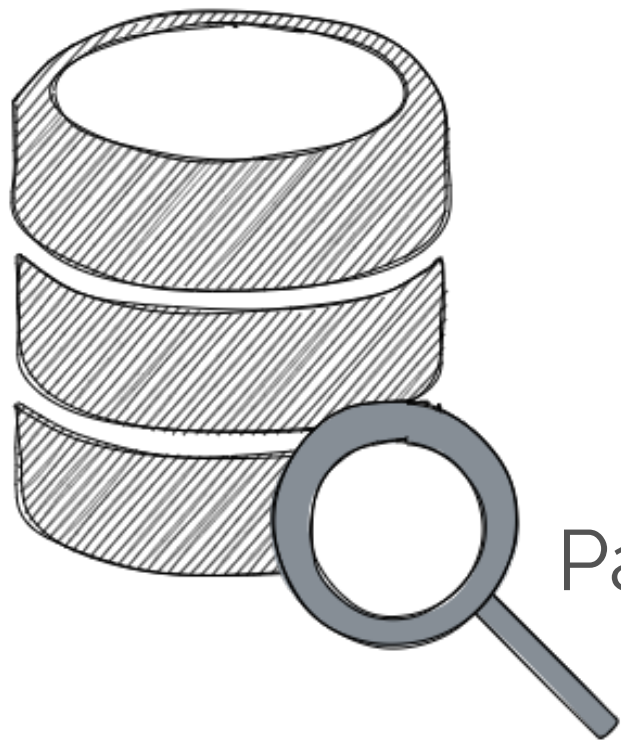
Optimise Queries

Optimise Code (ORM)

Suggestions and Learning



DBA



Observability

Performance Insights

Improvement suggestions



Parameters

Queries &

Supporting structures

[@ftisiot](#) | [@aiven_io](#)



Automatic optimisation

Performance stability

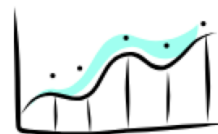
Aiven + EverSQL



Hi, what would you like to do today?



Optimize a single SQL query

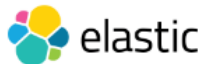


Analyze why my database is
slow

Please tell us which database you're using:



ORACLE



Other
databases

Free Developer Tools

SQL Query Optimizer

SQL Syntax Checker

SQL Formatter

Slow Query Log Visualizer

Text to SQL

SQL to Text

SQL to Hibernate Code

SQL to TypeORM Code

SQL to Prisma Code

SQL to Sequelize Code

SQL to Django Code

SQL to SQLAlchemy Code

SQL to GORM Code

SQL to Entity Framework Code

SQL to Doctrine Code

SQL to Laravel Code

MySQL Histogram Visualizer

SQL Query Optimization Tool C x +


← → ↻ eversql.com/sql-query-optimizer/

🏠 EverSQL

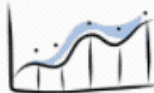
+ Invite members

support@eversql.com (588 credits) ▾

Hi, what would you like to do today?




Optimize a single SQL query



Analyze why my database is slow

OR

Take me to the optimization dashboard





Hi 🤖

Choose a database ▾

The load on your database is ↑ 21.6% higher this week, compared to the previous week.

These insights will guide you to your next optimization opportunities:

Get insights via Slack



3 new slow queries found this week, increasing the database load by ↑ 1.4%

Show me



1 queries slowed down this week, increasing the database load by ↑ 0.1% .

Show me



22 queries were executed more frequently this week, increasing the database load by ↑ 22.2% .

Show me



Improve performance and reduce storage cost by \$2924.2/year, by deleting 8 redundant indexes.

Show me

Show more insights ▾



Optimize a single query

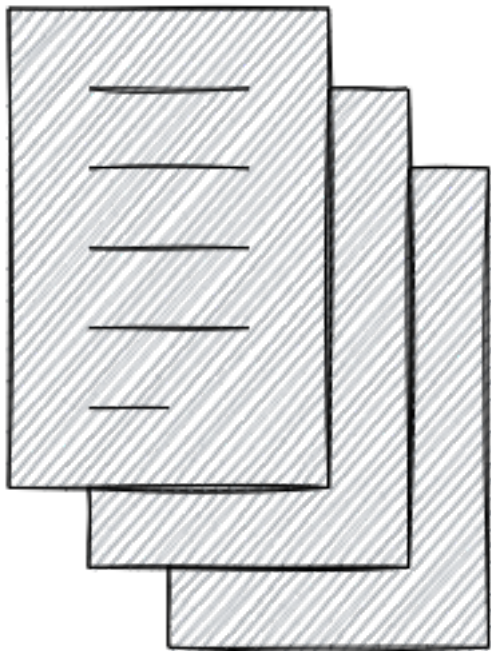


Analyze a slow query log

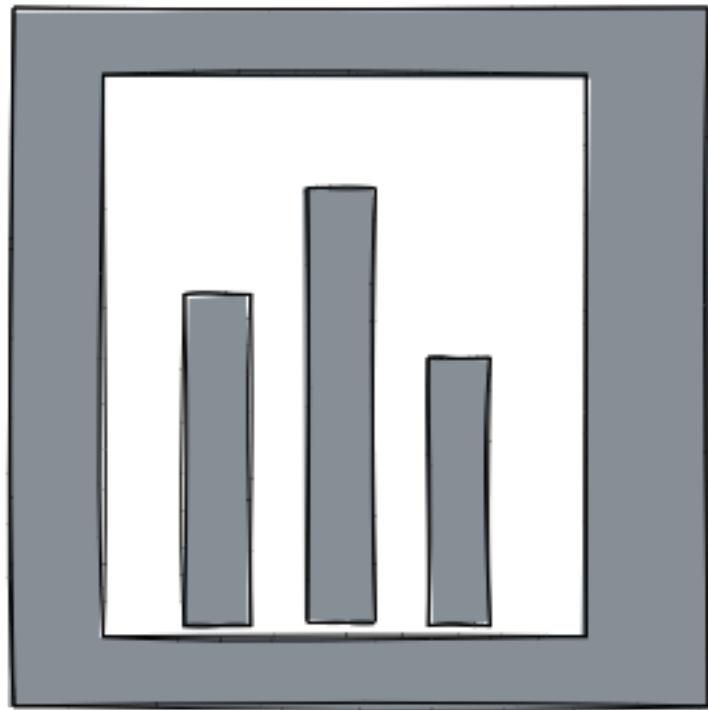


Monitor a new database

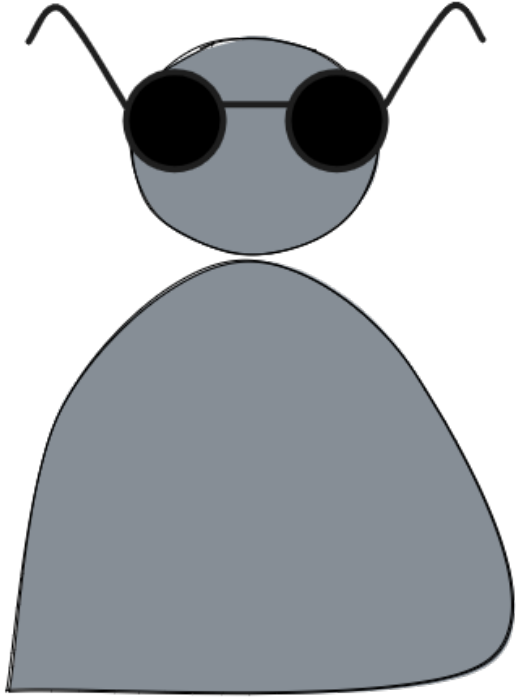
Query history



Database Metadata



Confidentiality



```
select *  
from ORDERS  
where  
    CUSTOMER= 'GIOVANNI'
```


sample-458
pg-6963205

← [Back to project](#)

- Overview
- Integrations
- Network
- Metrics
- Logs
- Query statistics
- Current queries
- Users
- Databases
- Pools
- Backups

My Organization / sample-458 / pg-6963205 / Overview



pg-6963205

PostgreSQL 15.4 EOL: 2027-11-11: OK Running Nodes 1

Get started with Aiven for PostgreSQL®





Set up, secure, and integrate your Aiven service with a step-by-step guide.

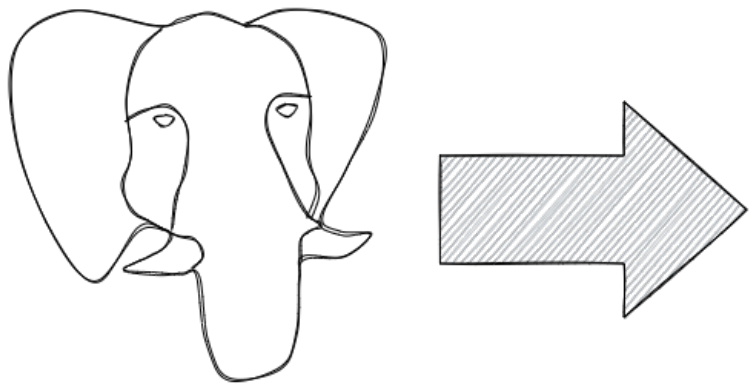
[Get started](#)



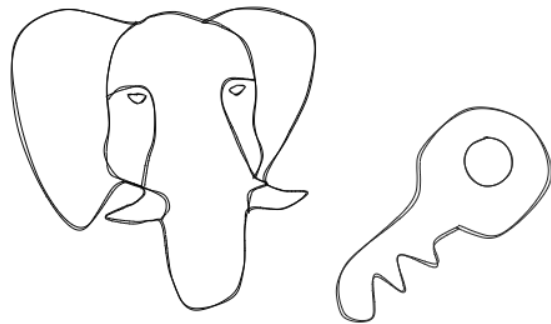
Connection information

[Quick connect](#)

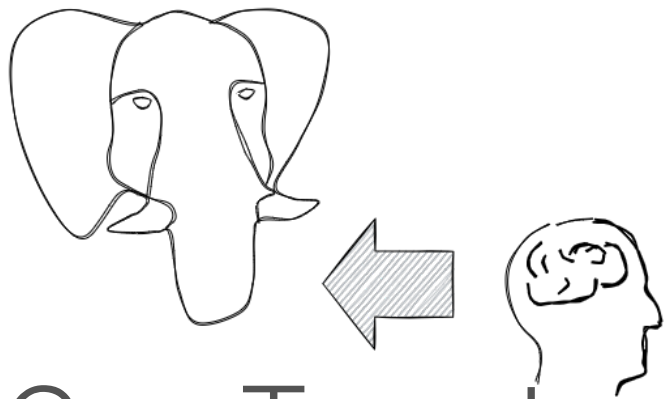
Service URI	postgres://CLICK_TO_REVEAL_PASSWORD@pg-6963205-sample-458.aivencloud.com:21472/defaultdb?sslmode=require	
Database Name	defaultdb	
Host	pg-6963205-sample-458.aivencloud.com	
Port	21472	



PG as Source



PG as key component



PG as Target

<https://go.aiven.io/pgconfeu-aiven>



300\$

<https://go.aiven.io/pgconfeu-eversql>



PGConf2023