The Death of the Third Pedal: Why Your Database Platform Should Drive Itself

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Agenda

Part I: The Universal Human Drive for Simplicity

Part II: The Evolution of IT Infrastructure

Part 3: The Final Frontier - The Database

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The Universal Human Drive for Simplicity

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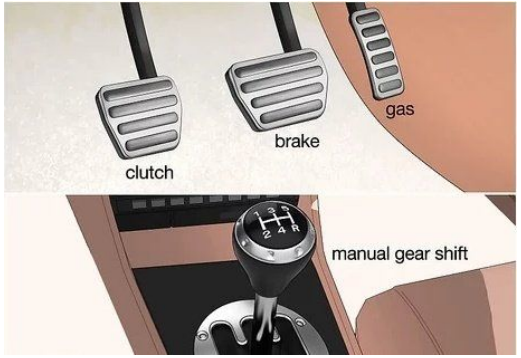
We Don't Want to Shift Gears; We Want to Arrive



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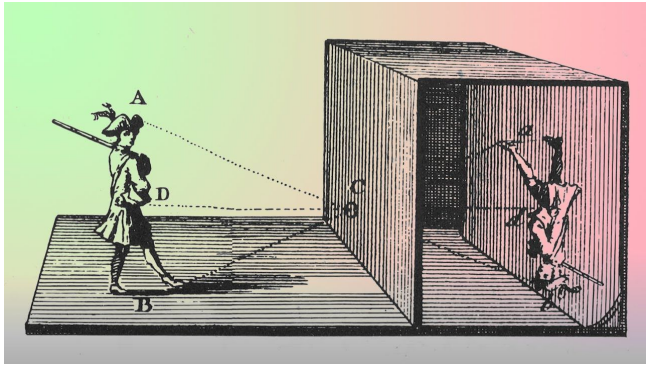
From Dark Rooms to Selfies



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From "Christmas Tree" to Integrated Masterpiece

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The Evolution of IT Infrastructure

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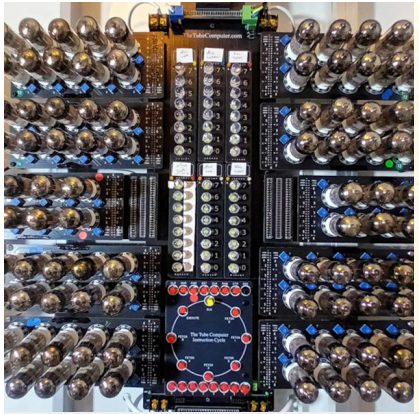
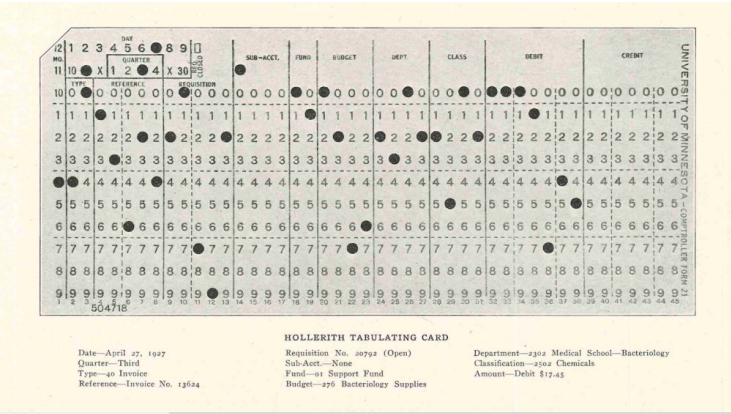
From Tumblers to Vibe Coding





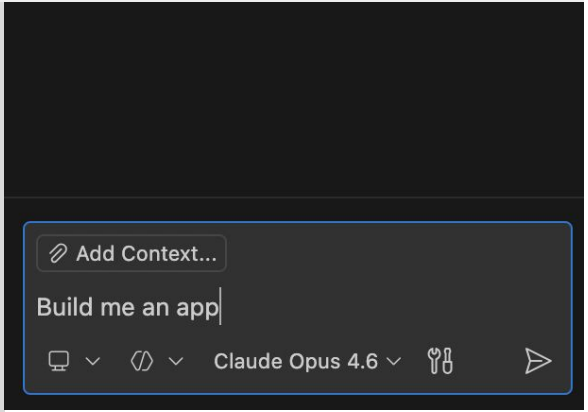
HOLLERITH TABULATING CARD

Date—April 27, 1927
Quarter—Third
Type—40 Invoice
Reference—Invoice No. 13624
Requisition No. 20792 (Open)
Sub-Acct.—None
Fund—01 Support Fund
Budget—276 Bacteriology Supplies
Department—2302 Medical School—Bacteriology
Classification—2502 Chemicals
Amount—Debit $17.45

```
section .data
    msg db 'Hello, World!', 0xa
    len equ $ - msg

section .text
    global _start

_start:
    ; write syscall
    mov eax, 4
    mov ebx, 1
    …
```

```
#include <iostream>

int main() {
    std::cout << "Hello, World!\n";
    return 0;
}
```

```
print("Hello, World!")
```



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Someone Else's Computer

Someone Else's Computer - Lies

01

Fully Managed Service

02

Cost Effective

03

You are in control

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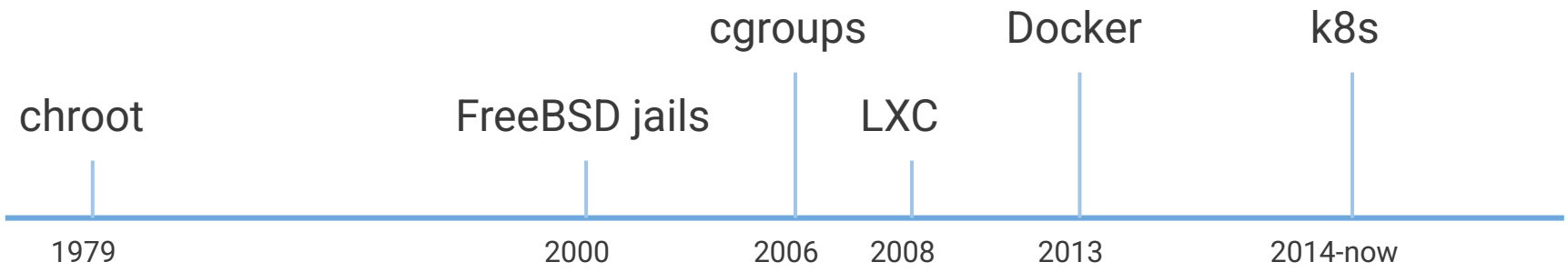
From chroot to Platform for Platforms




```
# 1. Create cgroup hierarchies
sudo mkdir /sys/fs/cgroup/cpu/mycontainer
sudo mkdir /sys/fs/cgroup/memory/mycontainer
sudo mkdir /sys/fs/cgroup/pids/mycontainer

# 2. Set resource limits
# Limit CPU to 50% of one core
echo 50000 > /sys/fs/cgroup/cpu/mycontainer/cpu.cfs_quota_us
echo 100000 > /sys/fs/cgroup/cpu/mycontainer/cpu.cfs_period_us

# Limit memory to 512MB
echo 536870912 > /sys/fs/cgroup/memory/mycontainer/memory.limit_in_bytes

# Limit to 100 processes
echo 100 > /sys/fs/cgroup/pids/mycontainer/pids.max

# 3. Start a process and add to cgroups
bash -c "echo $$ >> /sys/fs/cgroup/cpu/mycontainer/cgroup.procs && \
         echo $$ >> /sys/fs/cgroup/memory/mycontainer/cgroup.procs && \
         echo $$ >> /sys/fs/cgroup/pids/mycontainer/cgroup.procs && \
            exec python3 -m http.server 8000"
```

```
docker run -d \
  --name myapp \
  --cpus="0.5" \
  --memory="512m" \
  --pids-limit=100 \
  -p 8000:8000 \
    python:3 python3 -m http.server 8000
```

The Final Frontier: The Database

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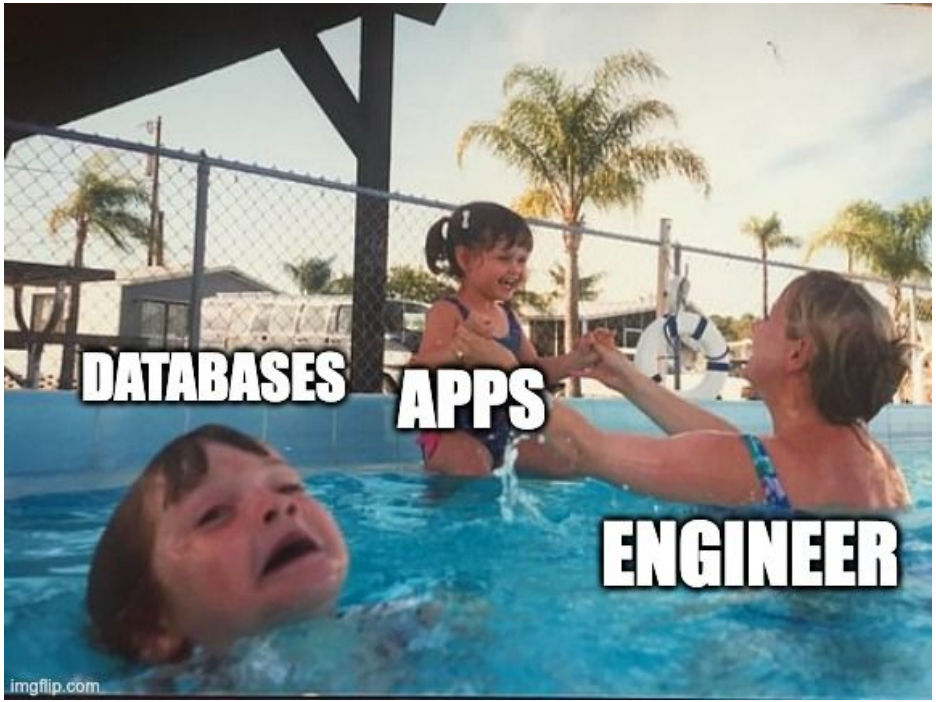
The Database: The Last Stick Shift

With all the advancements - databases are often not given enough love



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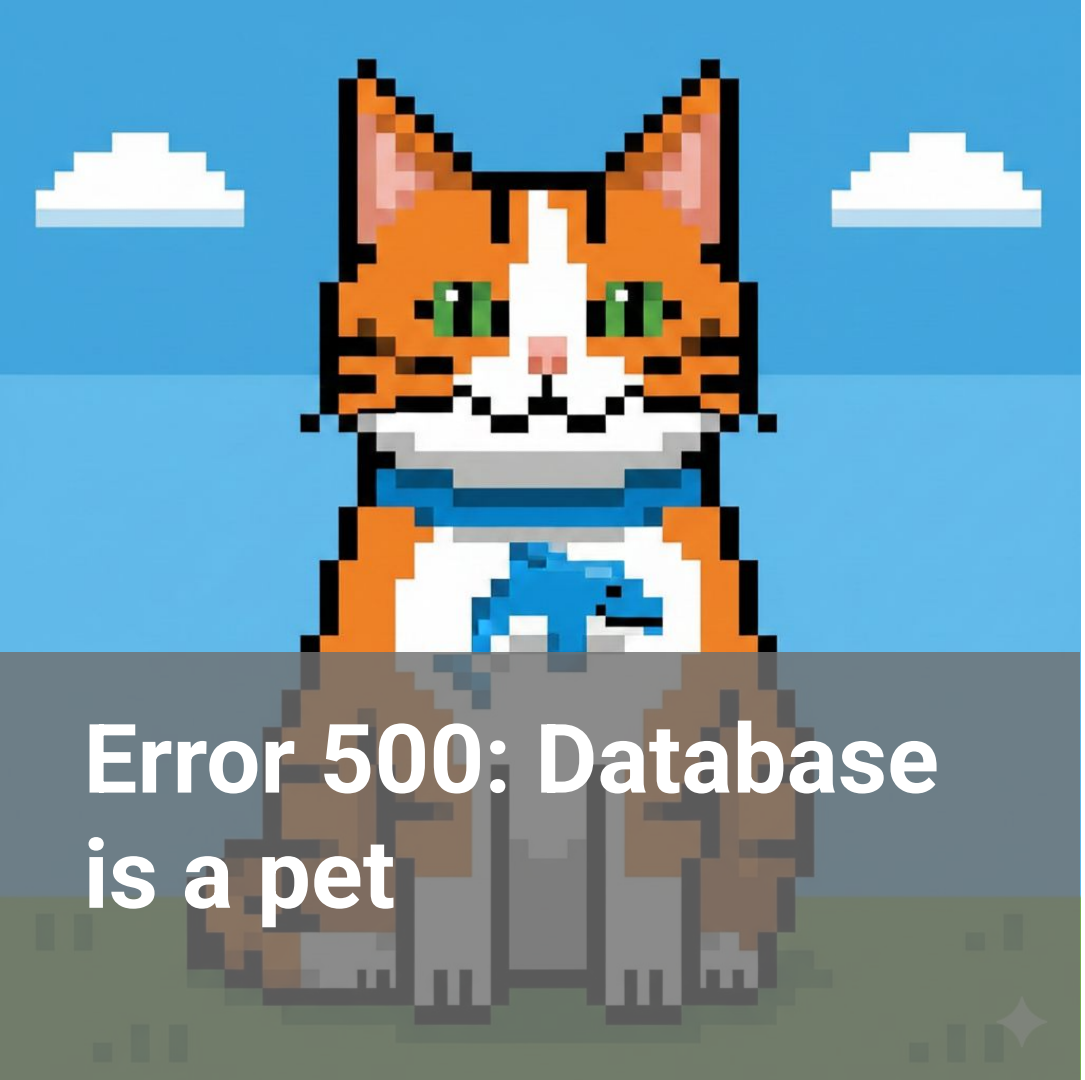
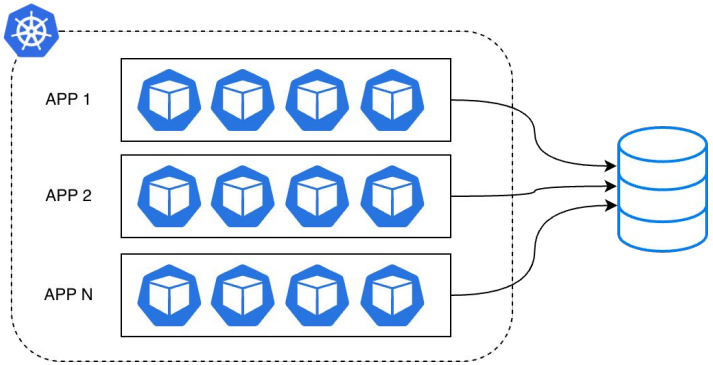


Error 500: Database is a pet

Application containers are disposable, but **Databases** are precious pets



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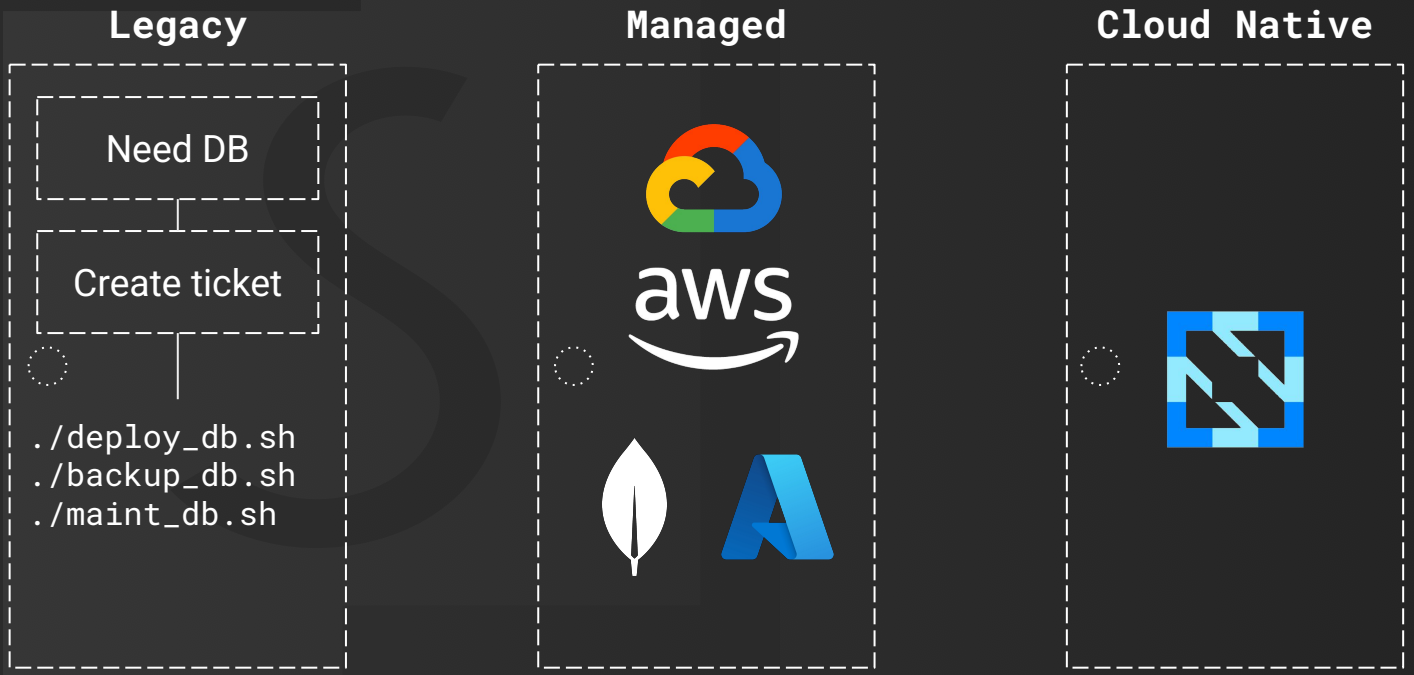
The Three Doors



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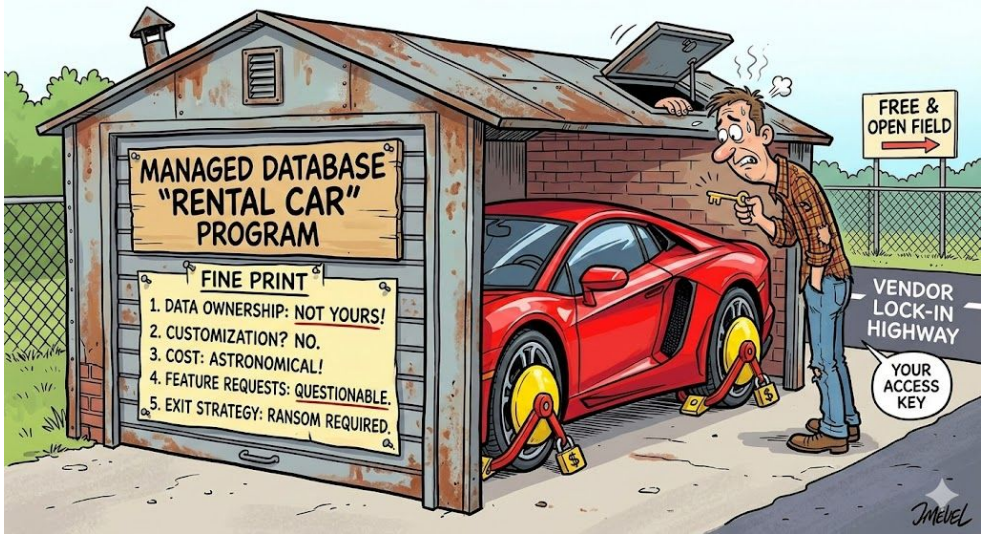
RDS and The "Rental Car" Paradox

1. Vendor lock - ransom
2. Scaling is easy, but gas is $5/L
3. Rental Agency outage



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The RDS vs. DIY Dilemma

RDS

Total Ease, but Total Captivity

Do It Yourself & Open Source

Total Control, but With Trade-offs.

We are forced to choose between Agility and Freedom. Why can't we have both?

The wish

- No trade-offs for DIY and OpenSource
  - Great experience, but locally
  - Simple
- Databases are treated as cattle
- We can do declarative, GitOps and other best practices

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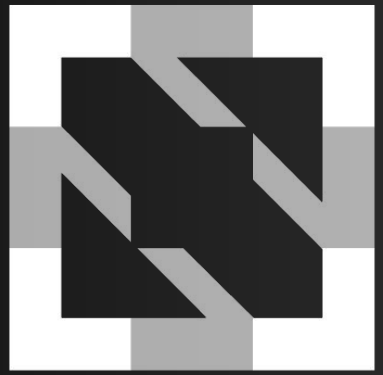

CLOUD NATIVE
COMPUTING FOUNDATION

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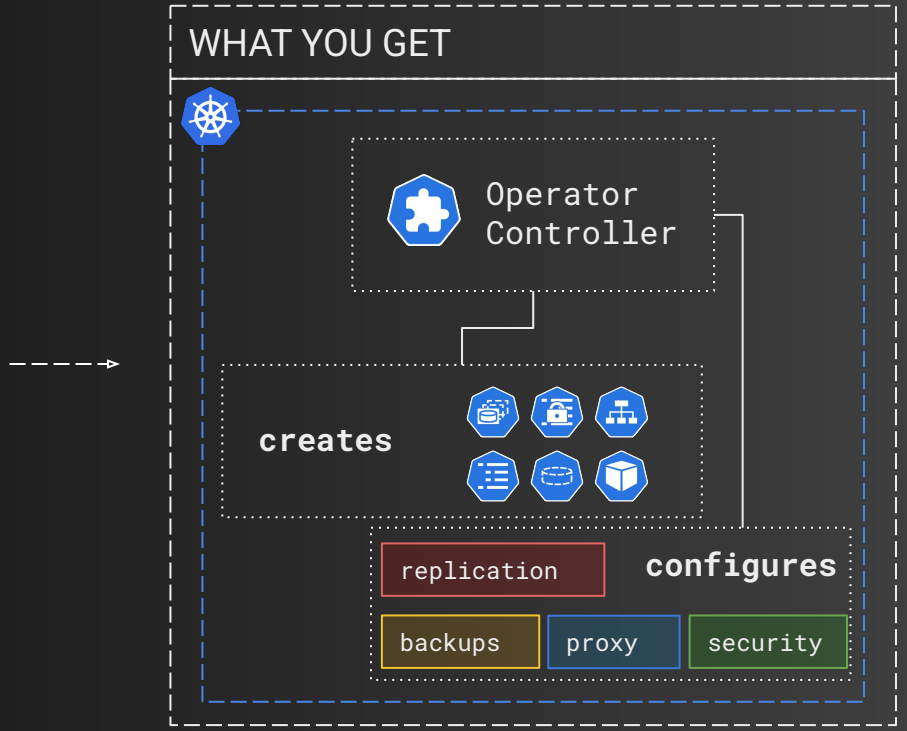
The magic: CRDs & Operators

WHAT YOU WRITE

```yaml
apiVersion: v1
kind: PostgresCluster
metadata:
  name: anti-fraud-db
spec:
  replicas: 3
  storage: 600Gi
  extensions:
    - pgvector
```



CRD = Your intent or desire
Operator = The robot that makes it happen

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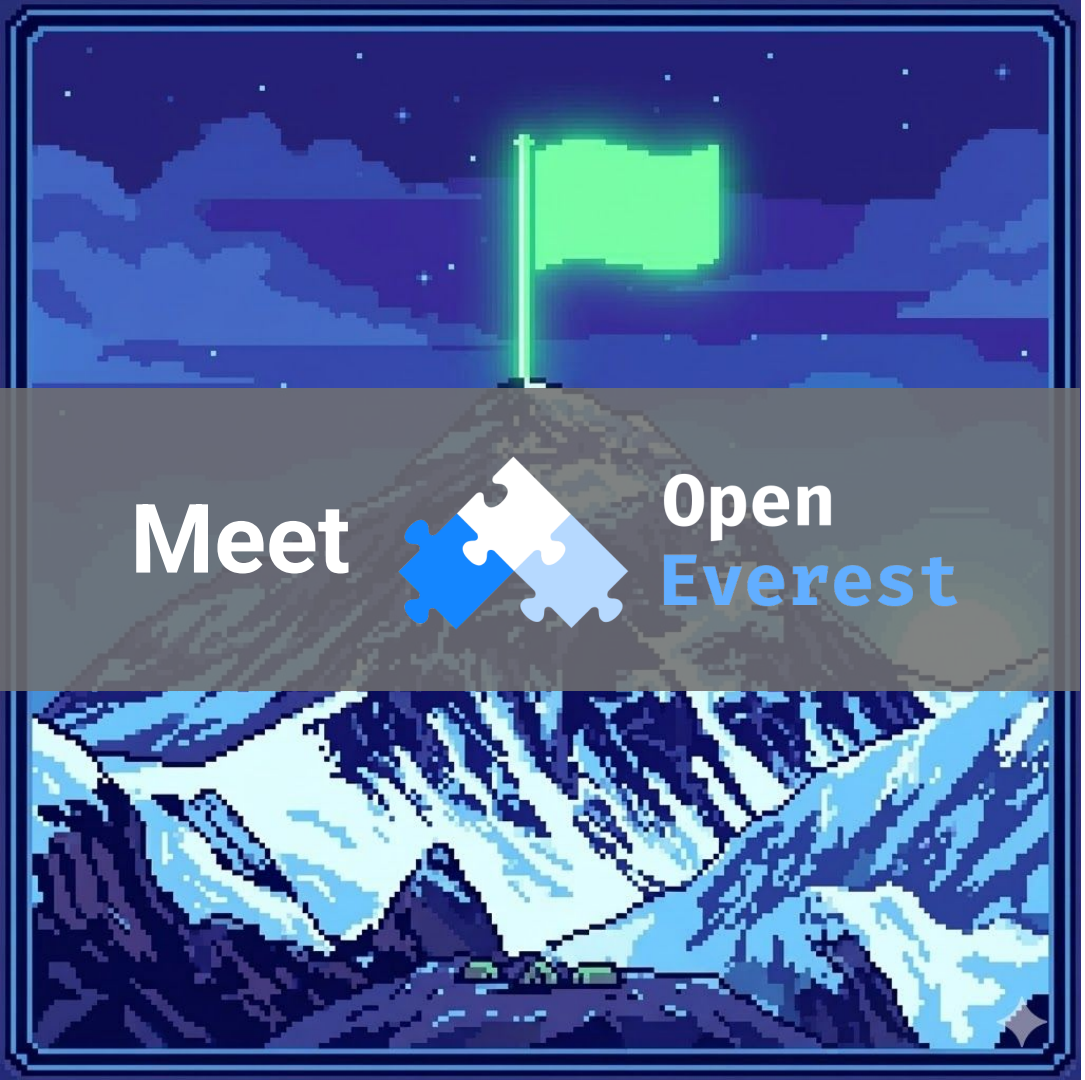

Cloud Native Database Platform

Now:

- 100% Open Source
- Production ready

Coming soon:

- Modular core
- CNCF Sandbox

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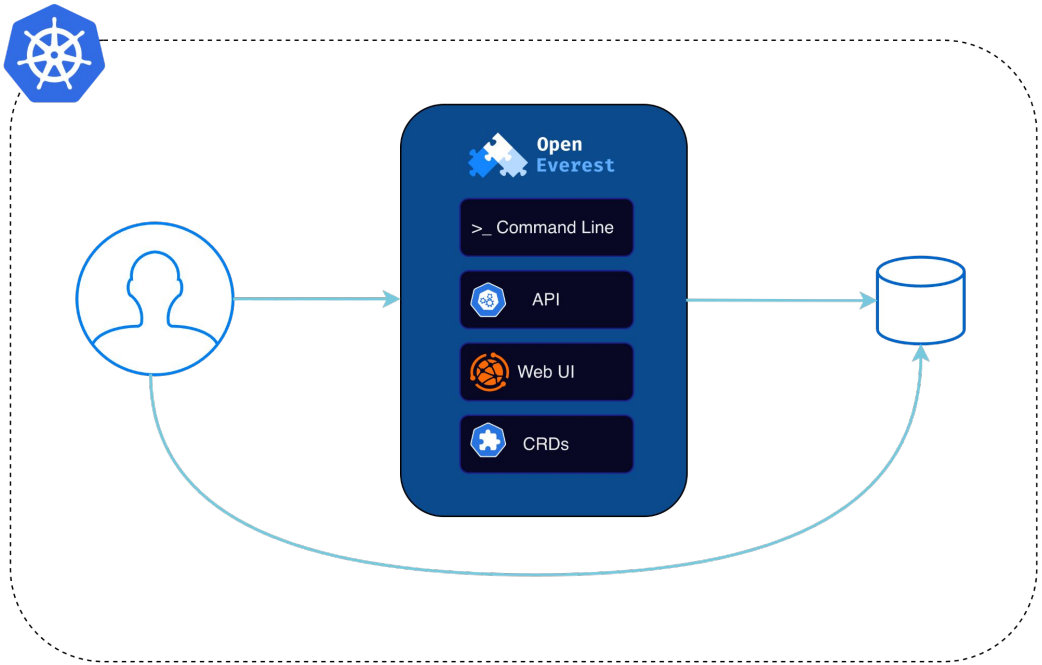
Simplicity Is Here



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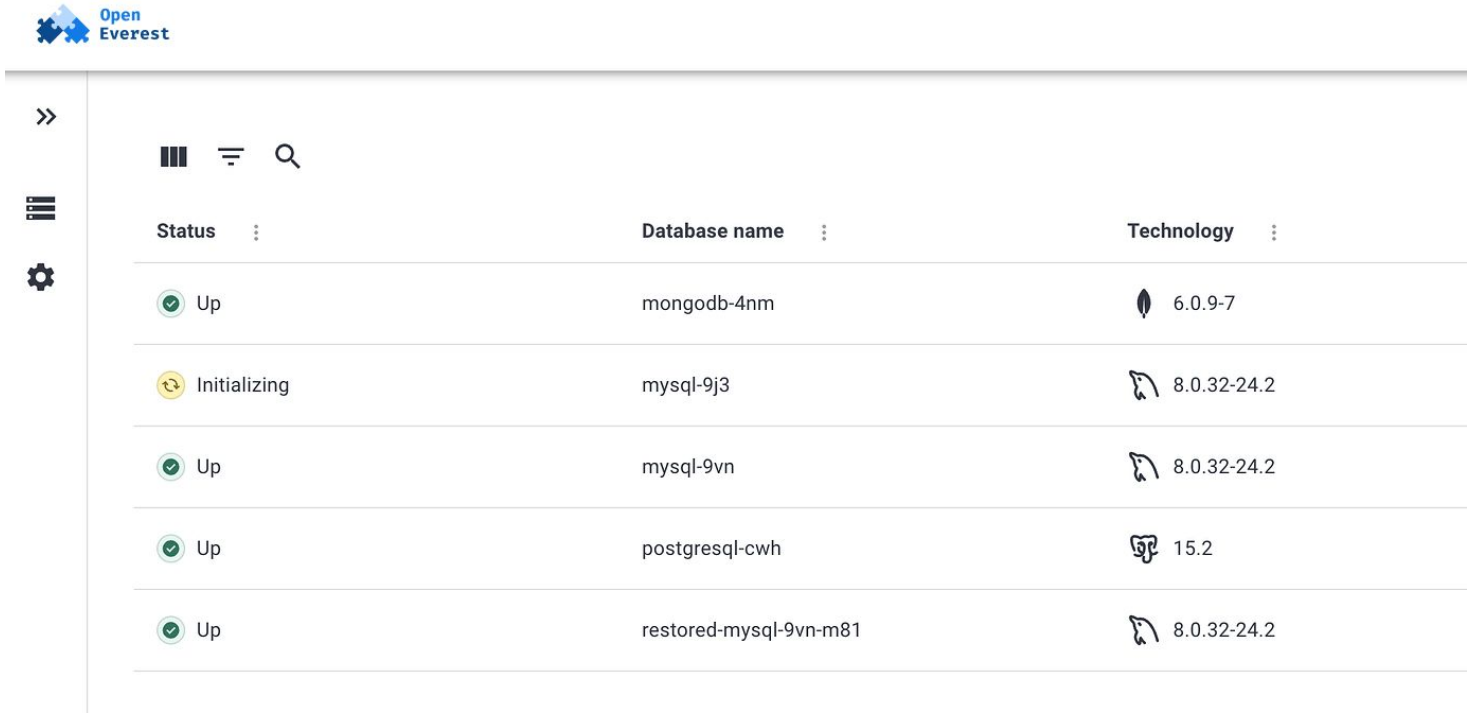
Simplicity Is Here - UI



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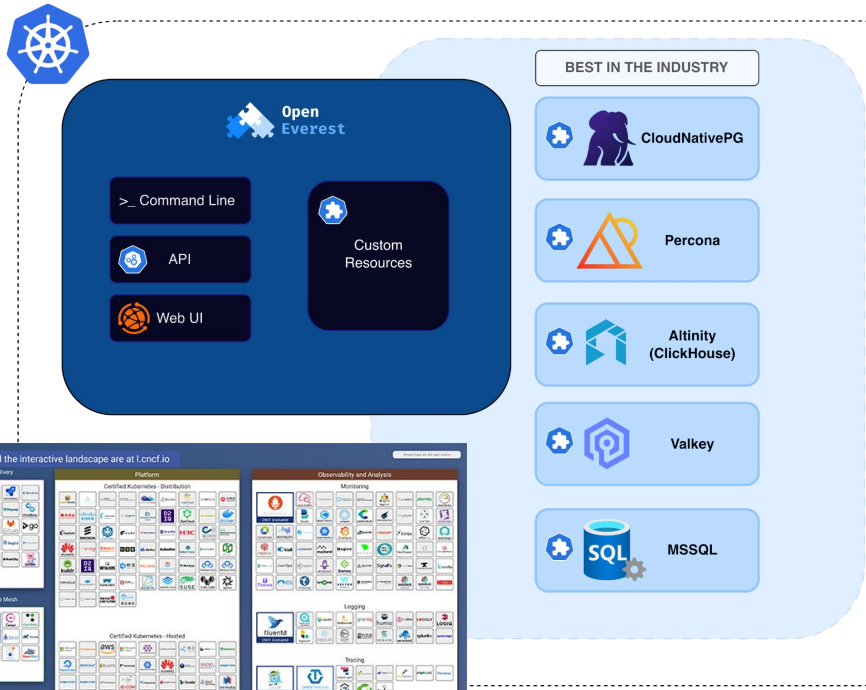
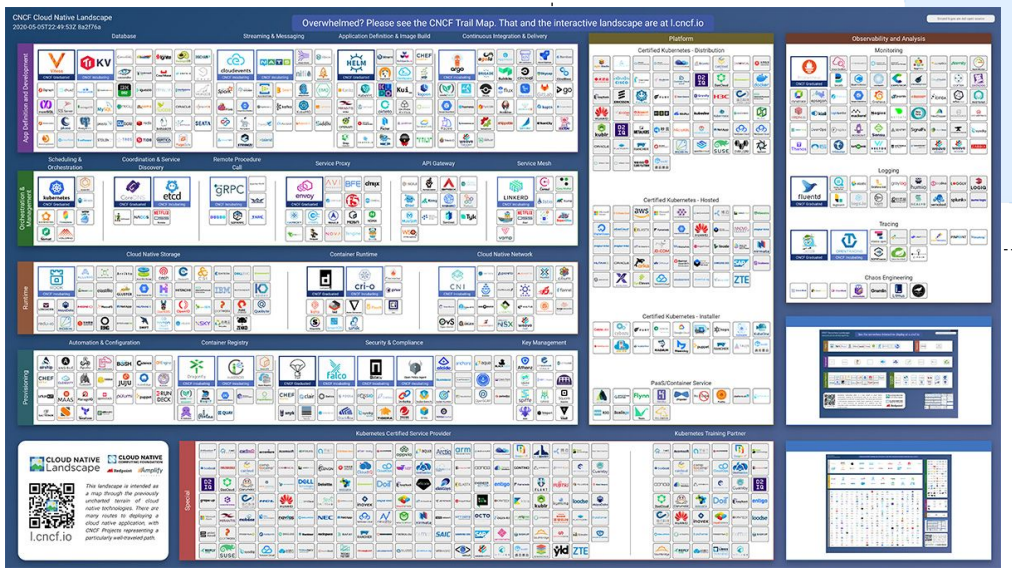
Encoded Wisdom of Operators





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Roadmap

[1] MODULAR CORE
- Add your technology (see GH openeverest/roadmap)
- Package using our boilerplate

[2] OPEN SOURCE AND CNCF
- Vendor agnostic, proper governance
- Applied to CNCF Sandbox (in voting now)

[3] INTEGRATE
- Use your favorite Cloud Native tools with ease

Thank you!

Any questions?

#openeverest-users @ CNCF Slack
openeverest.io/#community
Github: openeverest/openeverest

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