



MILTON LENIS

MULTITENANT ARCHITECTURES IN PYTHON



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MILTON LENIS



monadical



python
CALI



WE ARE HIRING!

The screenshot shows a poker hand in progress on the Oddslingers.com platform. The game is titled "1/2 NLHE Boogie" with a "1/2 No Limit Hold'em" format. The table is a green felt with a brick wall background. The pot is 392 chips. The community cards are 6♣, 2♣, and A♠. The flop is 2♠, K♠, 6♠. The river is 2♠, K♠, 6♠, 3♠, [K♥]. The turn is 2♠, K♠, 6♠, [3♠]. The hand action shows MONTECARLOHALL calling, MILTONLN running out of time and folding, GNOME_CHOMSKY raising to 91, JOHNNNYCACHE folding, MONTECARLOHALL raising to 264, VIM DIESEL folding, MONTECARLOHALL having 3♠, A♠ (Two Pair, Kings and Threes), GNOME_CHOMSKY mucking, MONTECARLOHALL winning the main pot with two pair, kings and threes for 247 chips, GNOME_CHOMSKY adding 100 chips, MONTECARLOHALL posting 1.5B, VIM DIESEL posting 2BB, PAUL_GNUMAN folding, GNOME_CHOMSKY folding, JOHNNNYCACHE folding, MONTECARLOHALL raising to 7, VIM DIESEL calling 7, and the flop being 7♠, K♠, 3♥.

Players and chip counts:

- MONTECARLOHALL: 2,622 chips
- MILTONLN: 538 chips
- VIM DIESEL: 11,509 chips
- PAUL_GNUMAN: 155 chips
- JOHNNYCACHE: 9,017 chips
- GNOME_CHOMSKY: 0 chips

Community cards: 6♣, 2♣, A♠

Pot: 392 chips

Hand Action:

- MONTECARLOHALL CALL
- MILTONLN RAN OUT OF TIME AND FOLDED
- GNOME_CHOMSKY RAISED TO 91
- JOHNNYCACHE FOLDED
- MONTECARLOHALL RAISED TO 264
- VIM DIESEL FOLDED
- TURN: 2♠, K♠, 6♠, [3♠]
- RIVER: 2♠, K♠, 6♠, 3♠, [K♥]
- MONTECARLOHALL HAS 3♠, A♠ (TWO PAIR, KINGS AND THREES)
- GNOME_CHOMSKY MUCKED
- MONTECARLOHALL WON THE MAIN POT WITH TWO PAIR, KINGS AND THREES FOR 247 CHIPS
- GNOME_CHOMSKY ADDED 100 CHIPS
- MONTECARLOHALL POSTED 1.5B
- VIM DIESEL POSTED 2 BB
- PAUL_GNUMAN FOLDED
- GNOME_CHOMSKY FOLDED
- JOHNNYCACHE FOLDED
- MONTECARLOHALL RAISED TO 7
- VIM DIESEL CALLED 7
- FLOP: 7♠, K♠, 3♥

Chat Log:

- JOHNNYCACHE CALLED 9
- MONTECARLOHALL CALLED 9
- MILTONLN RAN OUT OF TIME AND FOLDED
- FLOP: 2♠, K♠, 6♠
- VIM DIESEL BET 27
- GNOME_CHOMSKY RAISED TO 91
- JOHNNYCACHE FOLDED
- MONTECARLOHALL RAISED TO 264
- VIM DIESEL FOLDED
- TURN: 2♠, K♠, 6♠, [3♠]
- RIVER: 2♠, K♠, 6♠, 3♠, [K♥]
- MONTECARLOHALL HAS 3♠, A♠ (TWO PAIR, KINGS AND THREES)
- GNOME_CHOMSKY MUCKED
- MONTECARLOHALL WON THE MAIN POT WITH TWO PAIR, KINGS AND THREES FOR 247 CHIPS
- GNOME_CHOMSKY ADDED 100 CHIPS
- MONTECARLOHALL POSTED 1.5B
- VIM DIESEL POSTED 2 BB
- PAUL_GNUMAN FOLDED
- GNOME_CHOMSKY FOLDED
- JOHNNYCACHE FOLDED
- MONTECARLOHALL RAISED TO 7
- VIM DIESEL CALLED 7
- FLOP: 7♠, K♠, 3♥

ODDSLINGERS.COM

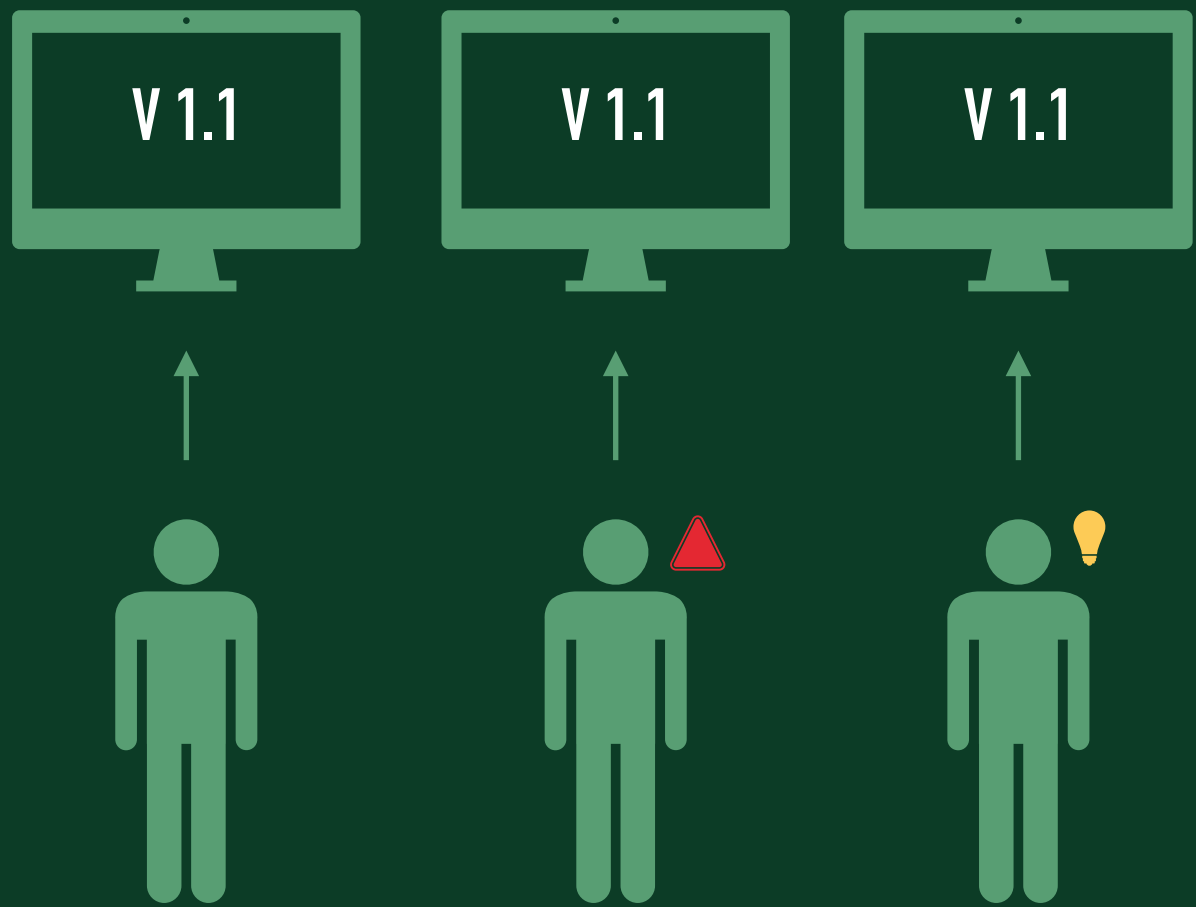
STORYTIME



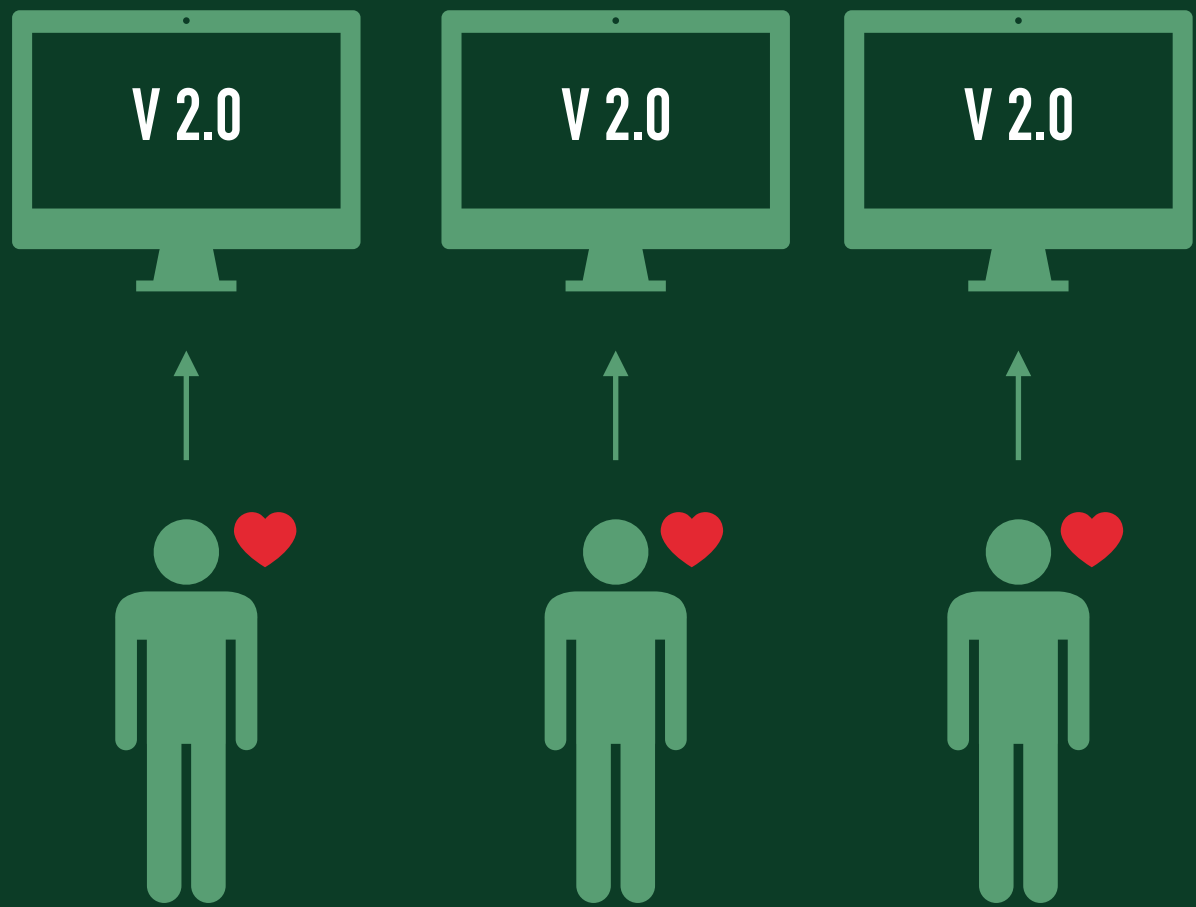




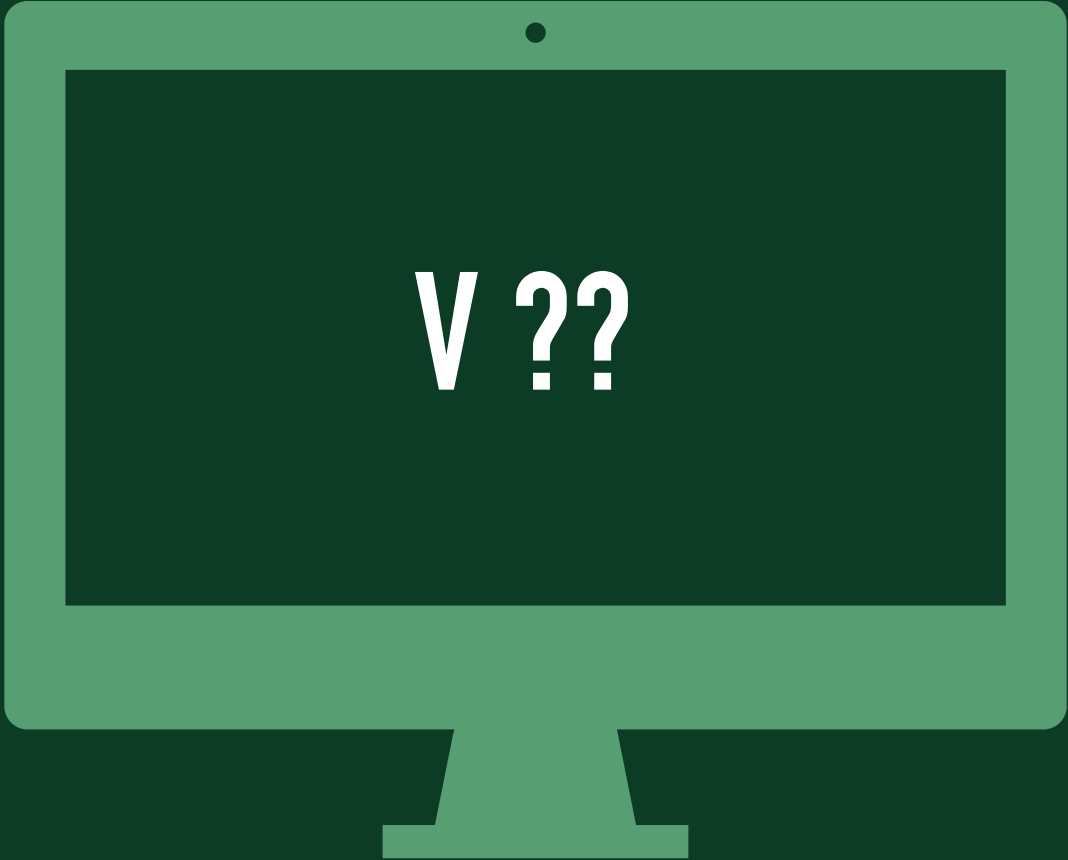












SOME PROBLEMS

- ▶ **Hard to maintain**
- ▶ **High costs**
- ▶ **Team grows with clients**

**BUT, WHAT
ALTERNATIVES DO WE
HAVE?**



MULTITENANT ARCHITECTURES

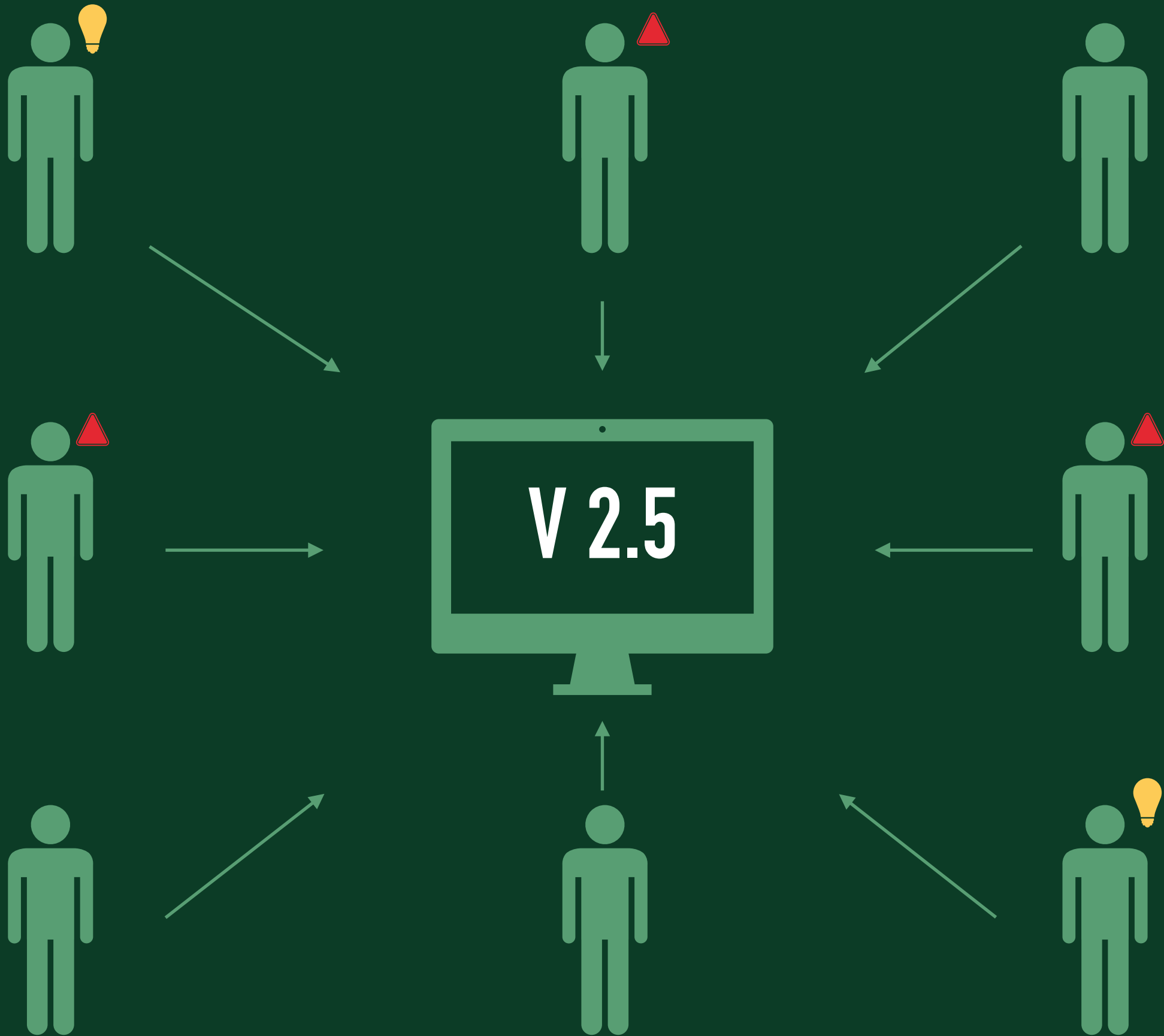
**A SINGLE SOFTWARE INSTANCE
RUNS MULTIPLE CUSTOMERS...**

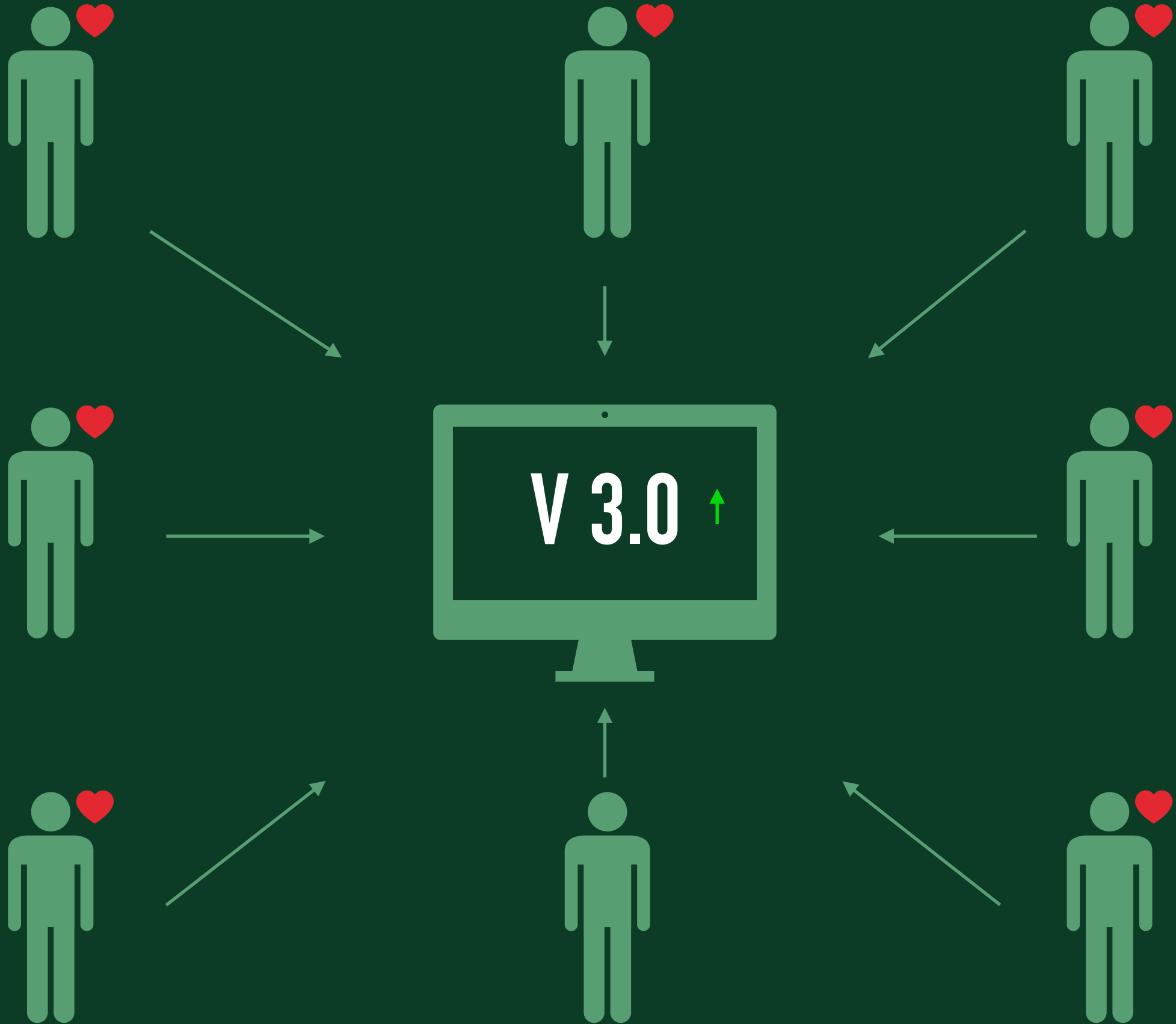
Wikipedia

**OPTIMIZE HARDWARE,
SOFTWARE AND
HUMAN CAPITAL**

**ISOLATED AND
SAFE**

**SEAMLESS TO
THE CLIENT**





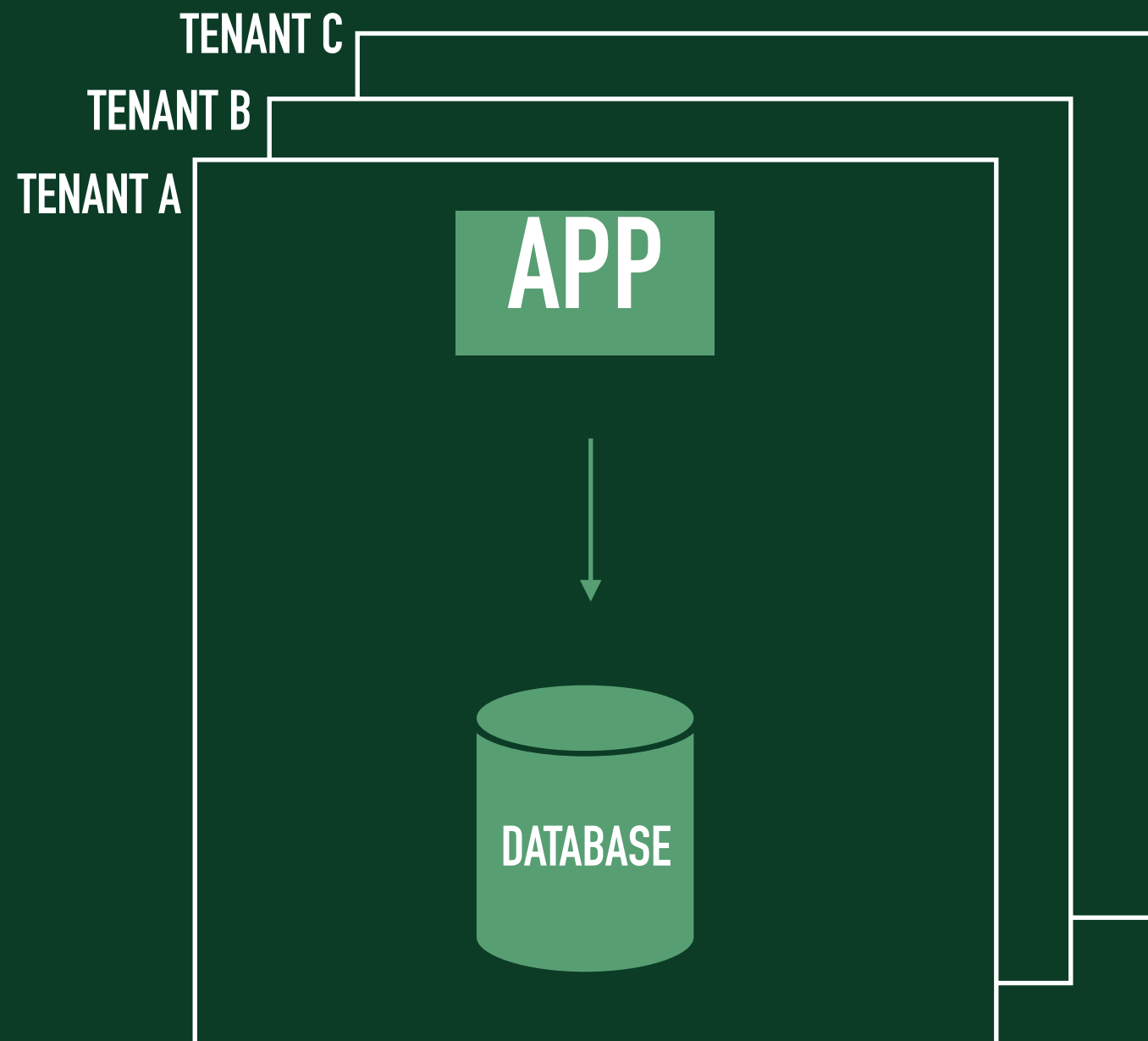
LET'S RECAP . . .

- ▶ **Single software instance for multiple customers**
- ▶ **Better use of resources**



TENANCY MODELS

SINGLE DATABASE



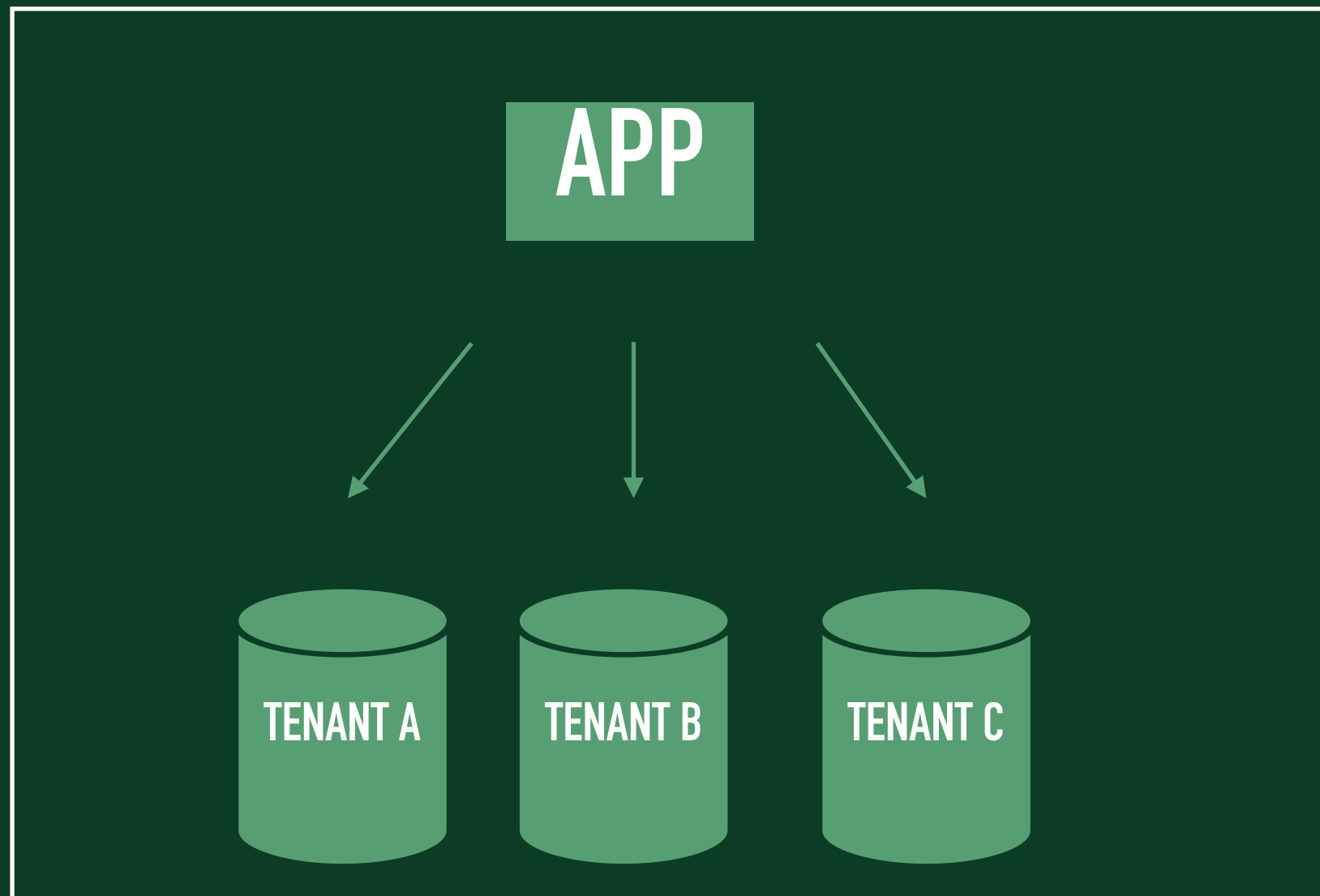
PROS

✓ **Easy Management**

CONS

- App Level Complexity
- Slower
- Impossible Customization

MULTIPLE DATABASES



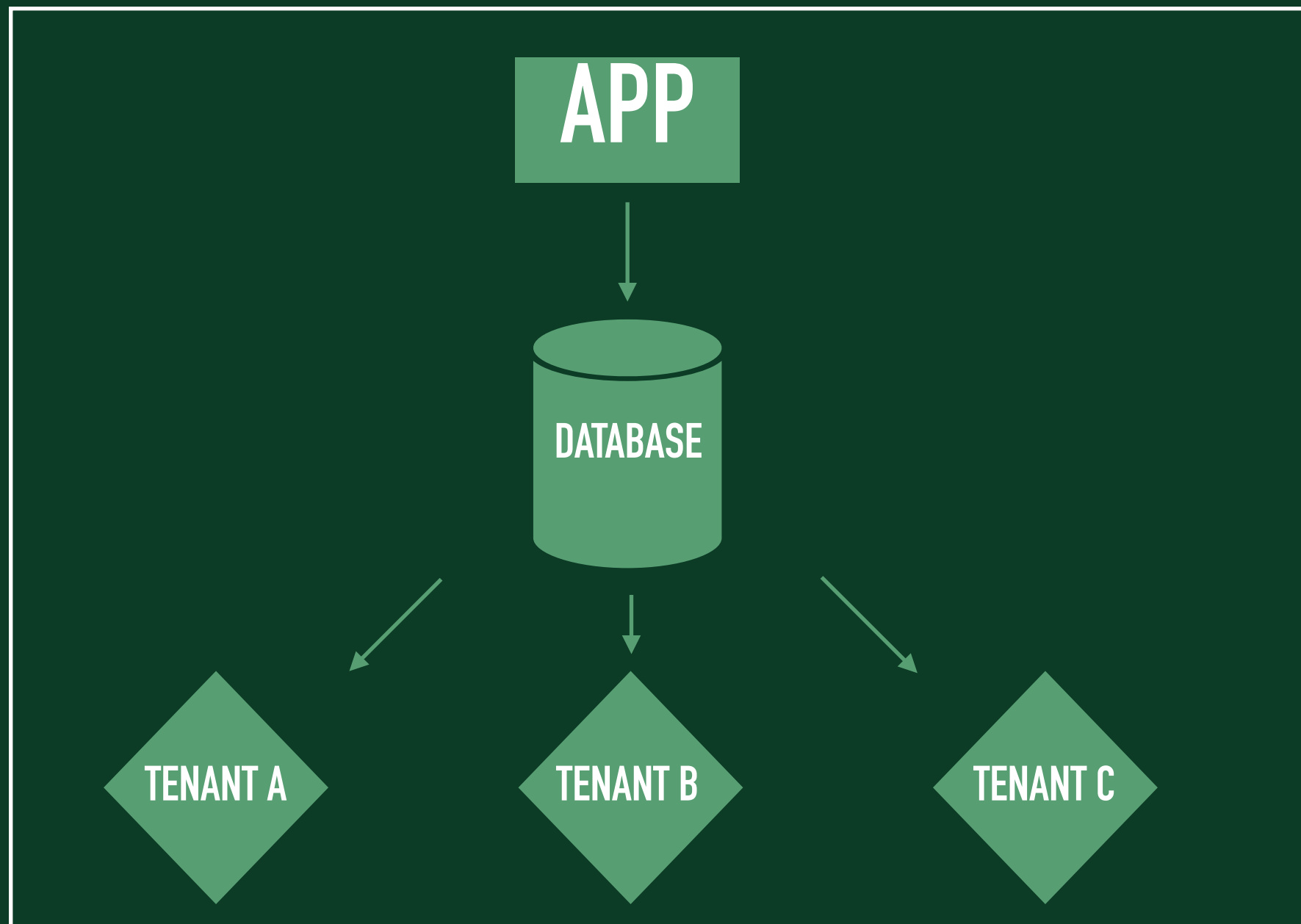
PROS

- ✓ DB Flexibility
- ✓ Highly Customizable
- ✓ Availability Guarantee

CONS

- Very Expensive
- Complex Management

SINGLE DATABASE, MULTIPLE SCHEMAS



PROS

✓ Cheap

✓ Customizable

✓ Better Features Balance

CONS

- Backup and Restore

**HOW TO CHOOSE
ONE?**

**WELL, IT
DEPENDS . . .**



django

IMPLEMENTATION

**SINGLE DATABASE,
MULTIPLE SCHEMAS**

DJANGO-TENANT-SCHEMAS

 [bernardopires / django-tenant-schemas](#)

 Watch ▾

57

 Unstar

742

 Fork

244

VS

DJANGO-TENANTS

 [tomturner / django-tenants](#)

 Watch ▾

22

 Unstar

174

 Fork

43


DJANGO-TENANT-SCHEMAS

- ✓ Shared and Tenant-specific
- ✓ Tenant View-Routing

django-tenant-schema
latest

Search docs

- Installation
- Using django-tenant-schemas
- Advanced Usage
- Examples
- Specializing templates based on tenants
- Tests
- Get Involved!



Sentry provides open-source error tracking. Fix production bugs in seconds!

Ads served ethically

Read the Docs v: latest

Docs » Welcome to django-tenant-schemas documentation!

[Edit on GitHub](#)

Welcome to django-tenant-schemas documentation!

This application enables [Django](#) powered websites to have multiple tenants via [PostgreSQL schemas](#). A vital feature for every Software-as-a-Service website.

Django provides currently no simple way to support multiple tenants using the same project instance, even when only the data is different. Because we don't want you running many copies of your project, you'll be able to have:

- Multiple customers running on the same instance
- Shared and Tenant-Specific data
- Tenant View-Routing

What are schemas?

A schema can be seen as a directory in an operating system, each directory (schema) with it's own set of files (tables and objects). This allows the same table name and objects to be used in different schemas without conflict. For an accurate description on schemas, see [PostgreSQL's official documentation on schemas](#).

Why schemas?

There are typically three solutions for solving the multitenancy problem.

1. Isolated Approach: Separate Databases. Each tenant has it's own database.
2. Semi Isolated Approach: Shared Database, Separate Schemas. One database for all tenants, but

<https://github.com/MiltonLn/pycon-multitenant>



@MiltonLn

A long, empty hallway with rows of lockers on both sides and fluorescent lights on the ceiling. The hallway is brightly lit, and the lockers are arranged in a grid pattern. The perspective is from the end of the hallway, looking down its length.

MY EXPERIENCE

SIND

The screenshot shows the SIND website with the following elements:

- Header:** SIND logo and "SISTEMA DE INFORMACIÓN NACIONAL DEL DEPORTE" text. A search icon and "Iniciar sesión" button are on the right.
- Navigation Menu:** INICIO, SERVICIOS, REPORTES, BUSCADOR, CLASIFICADOS, NOTICIAS, DIRECTORIO, NORMOGRAMA.
- Main Banner:** "Agenda académica: nutrición, psicosocial, fisiología del ejercicio" with a sub-header "El equipo de Información y Estudios del Deporte en apoyo estratégico con la Institución...".
- Right Sidebar:** "EXPOSICIÓN DE MOTOS", "INVESTIGACIÓN EN DEPORTE, REDES Y LINEAS, COLCIENCIAS-COLDEPORTES", and "II CONGRESO COLOMBIANO DE CIENCIAS DEL DEPORTE".
- Search Section (Buscador):** Fields for "Nombre de la entidad", "Tipo de entidad", and "Departamento", with a "Buscar" button.
- Programas Institucionales:** Four program cards: "Deporte Social Comunitario" (DSC), "Campamentos Juveniles", "Habitos y Estilos de Vida Saludable", and "Programa de Investigación Coldeportes".
- Clasificados:** A section with a "Ver más" button and the message "No hay clasificados activos en el sistema".

~ 500 TENANTS

PROJECT 1

- ▶ Client and Server
- ▶ Django restframework

PROJECT 2

- ▶ **React / Redux Client**
- ▶ **GraphQL**
- ▶ **Apollo Client**



CLOSING THOUGHTS

-
- ▶ **Multitenant is awesome!**
 - ▶ **Quick MVPs**
 - ▶ **As efficient as you want**

THANK YOU!
ANY QUESTIONS?



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