



NoSQL

GAMES



wooga

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twitter: @phuesler
github: phuesler



BONUS



CAMERA

DOG

SEAGULL

LUGGAGE

ICE CREAM

RAKE

Pocket Village





Build the most beautiful village



Monster World

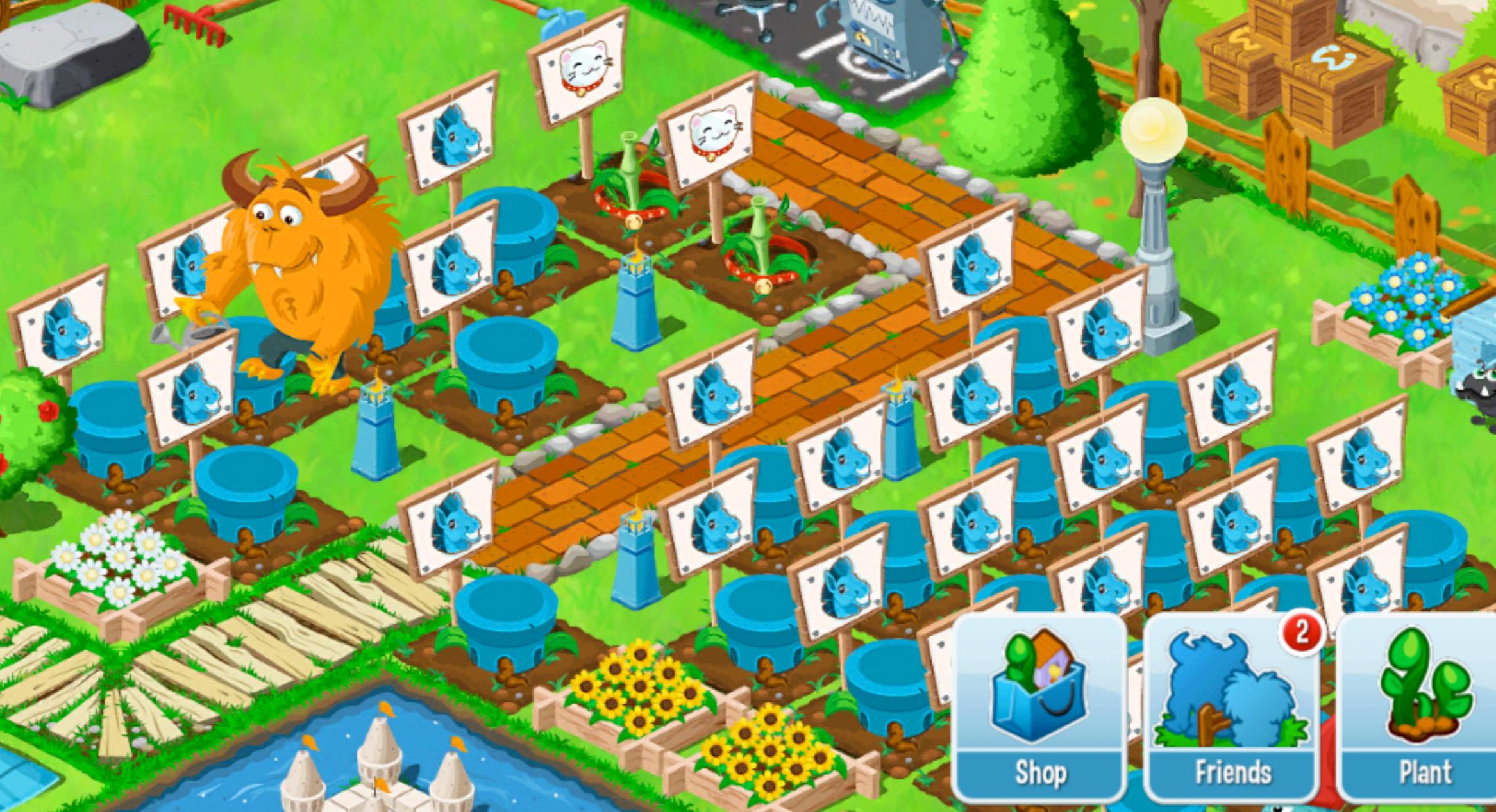
Lvl 22

604

8.417

64

14:33:58



Shop



Friends



Plant



481.150



27



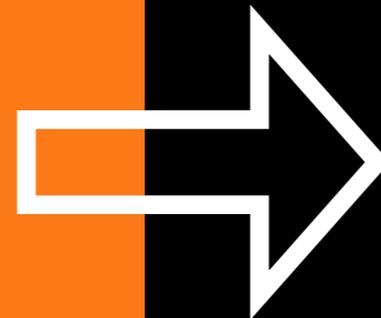
A polar bear and a dog are playing with a large red ball. The polar bear is on the right, holding the ball with its mouth. The dog is on the left, drinking water from a wooden trough. The background is a snowy, outdoor setting.

How to build

GAMES

FACEBOOK

FLASH



GAME BACKEND

IOS

ANDROID

SCALE



monthly active users

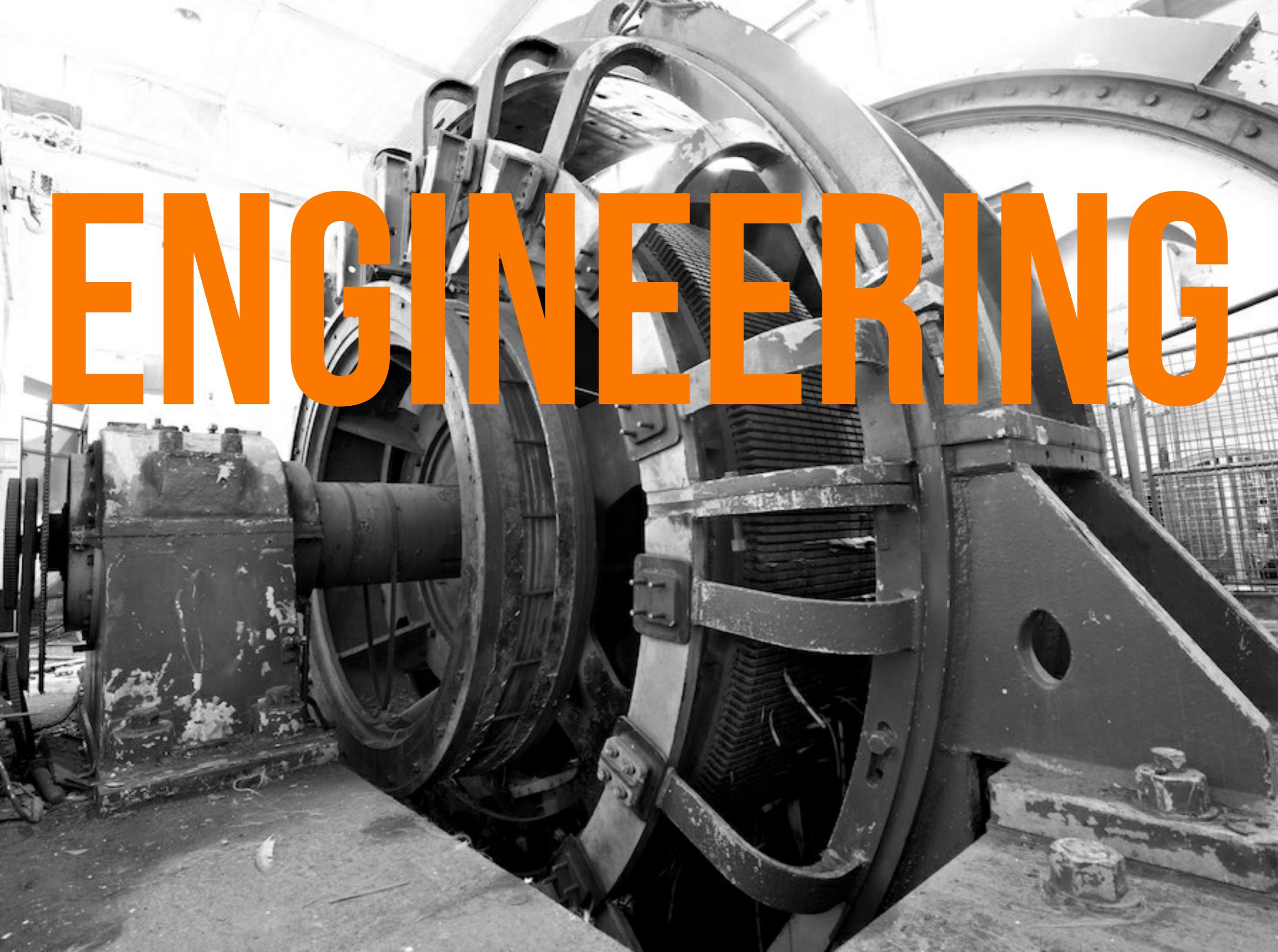
~28,000,000

for Diamond Dash

daily active users

~4,600,000

for Diamond Dash



ENGINEERING



You can call it

DEVOPS



YOU BUILD IT

YOU RUN IT

A black and white photograph of a hand holding a computer mouse. The hand is positioned in the center-left of the frame, with the mouse held in a way that suggests it is being used. The background is a soft, out-of-focus light gray. Overlaid on the image is the word 'DEVELOPER' in a large, bold, black, sans-serif font, centered horizontally across the top half of the image. Below it, the word 'friendly' is written in a smaller, orange, italicized, sans-serif font, centered horizontally and positioned over the hand and mouse.

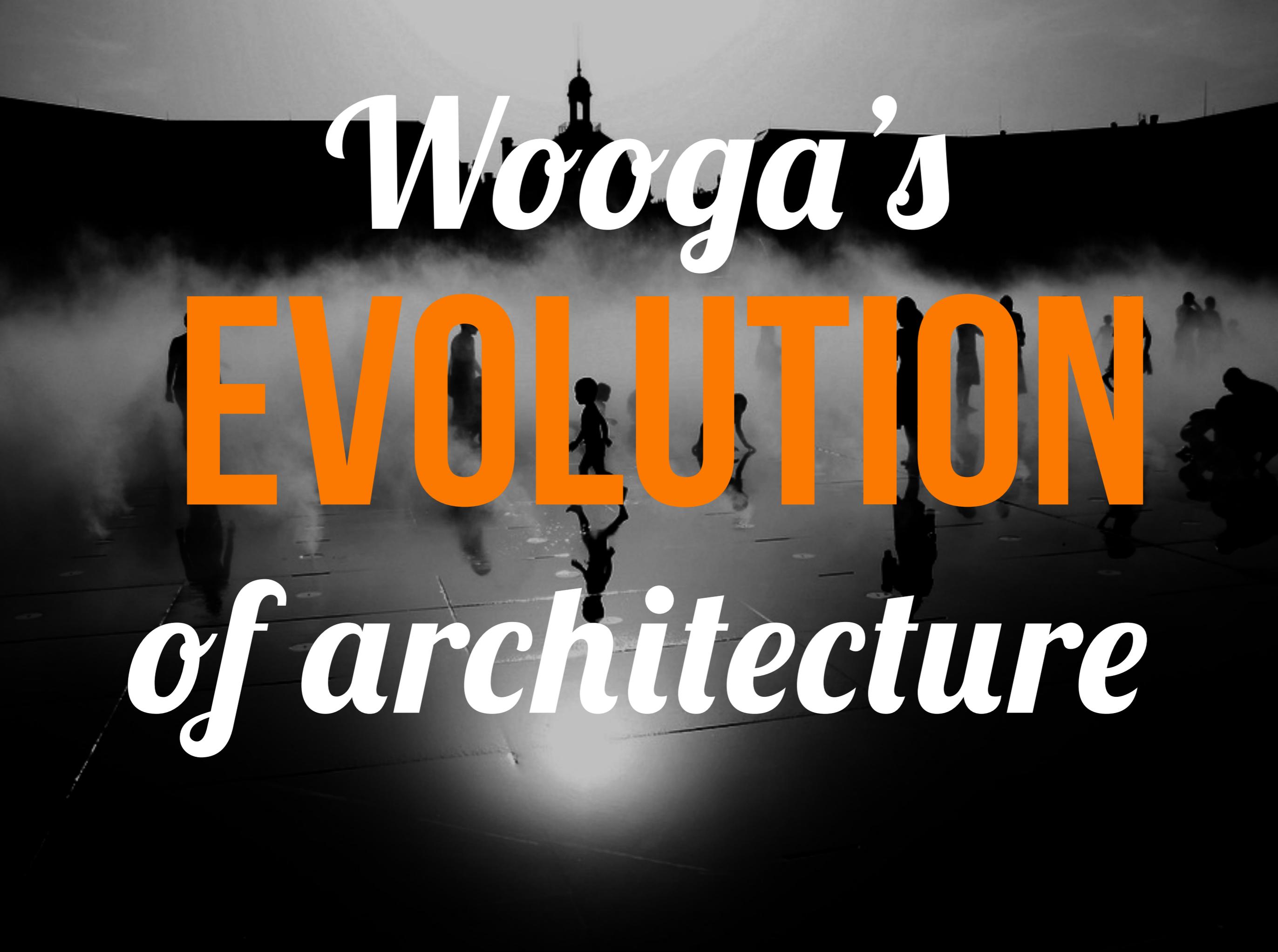
DEVELOPER

friendly

OPERATIONS

friendly

24R

A black and white photograph of a public square. In the background, there is a large building with a prominent dome and spire. The foreground is filled with the silhouettes of many people walking across the square. The ground is reflective, showing the inverted silhouettes of the people. The overall atmosphere is one of a busy, open public space.

Woolga's

EVOLUTION

of architecture

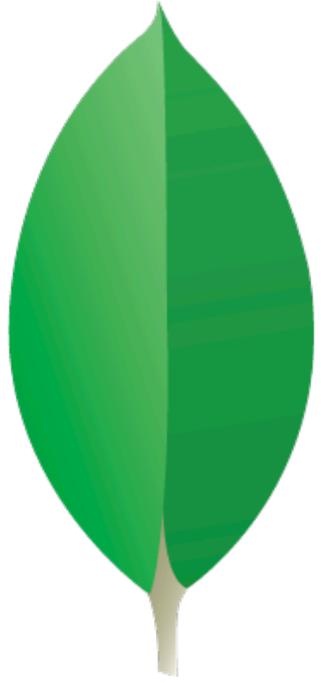


It starts with a

PROTOTYPE



CouchDB
relax



mongoDB

Add an

ADMIN

INTERFACE

SIMPLE

BACKEND

SERVICES

Past

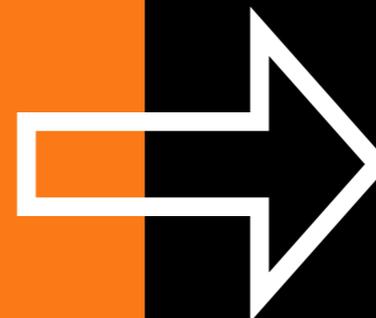
GAMES

1st

LEARNING

FACEBOOK

FLASH



**GAME BACKEND
REPORTING**

IOS

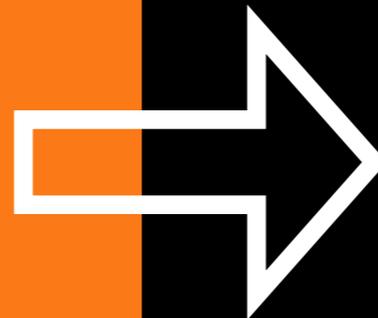
ANDROID

FACEBOOK

FLASH

IOS

ANDROID



GAME BACKEND

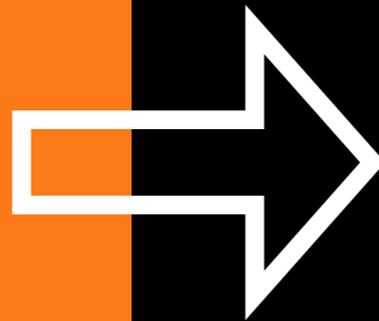
REPORTING

GAME 1

GAME 2

GAME 3

GAME 4

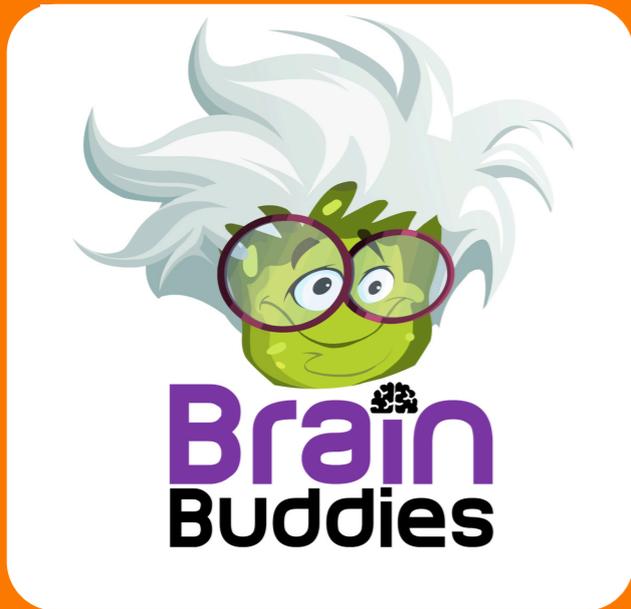


REPORTING



KAFKA

[HTTPS://KAFKA.APACHE.ORG/INDEX.HTML](https://kafka.apache.org/index.html)



TIME

Built with

LAMP

Built with

LAMP

*... well, nginx instead of
apache*

what have we

LEARNED?

mysql is often

FAST ENOUGH



**Bubble
Island**



**Brain
Buddies**



**Monster
World**



TIME



To the

CLOUD



RAILS



LOAD BALANCER

APP SERVER

APP SERVER

APP SERVER

MASTER SHARD 1

MASTER SHARD 2

SLAVE SHARD 1

SLAVE SHARD 2



LOAD BALANCER

APP

DB

what have we

LEARNED?

different

USE CASE

arcade games

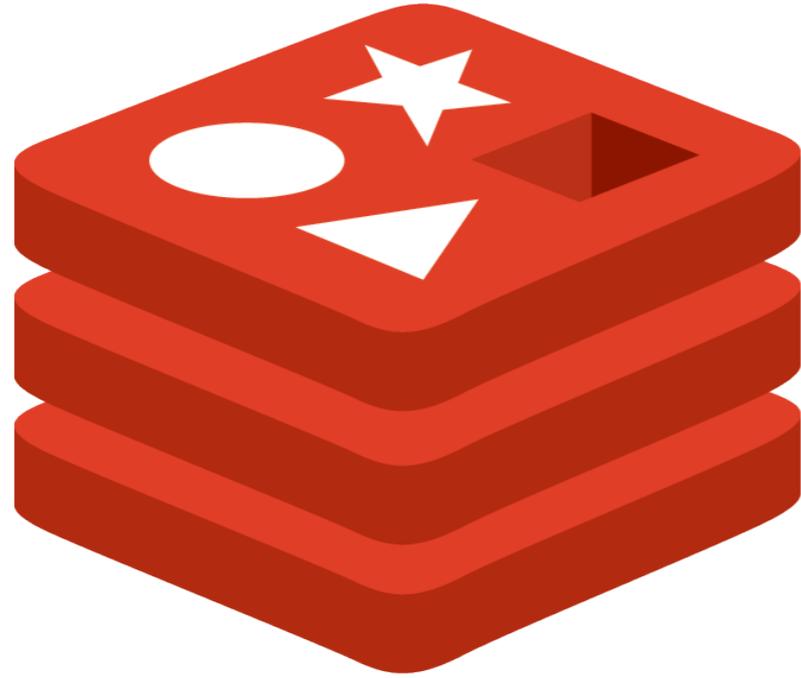
ARE NOT

farming games



DEAD

END



redis



Move

SLOW PARTS



Rinse and

REPEAT



what have we

LEARNED?

Adding more

MACHINES

*helps, but only to a certain
extent*

AUTOMATED

Server Provisioning

Pros and cons of

REDIS

Good code

ABSTRACTIONS

facilitate database

changes

TESTS

give confidence

Incremental

CHANGES

are easier to reason about

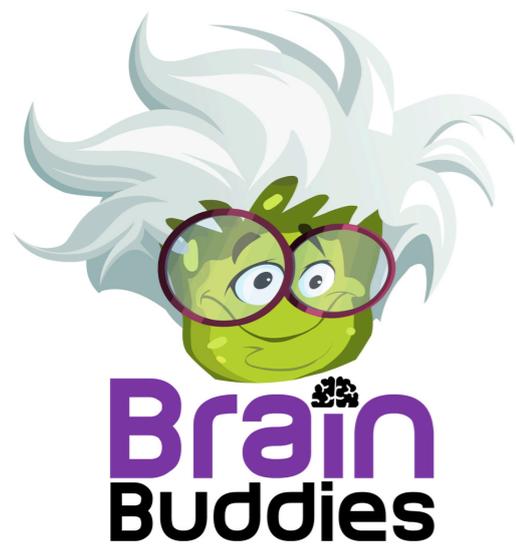
Incremental

ROLLOUTS

are easier to reason about

monitoring is

CRUCIAL



TIME



Back to

DEDICATED

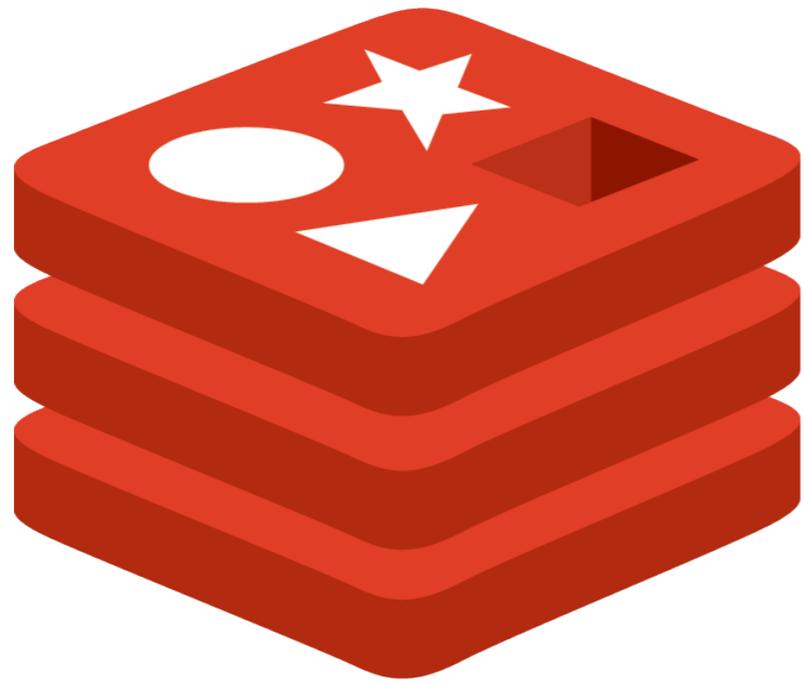
Faster

MACHINES

km/h

Faster

NETWORK



redis

LOAD BALANCER

APP SERVER

APP SERVER

APP SERVER

REDIS MASTER

REDIS SLAVE

U1_ROOMS_R1

U1_PETS_P2

U1_PETS_P3

U1_PETS_P4

U1_PETS_P5

U2_PETS_P1

U2_PETS_P2

U1_ROOMS_R1

U1_PETS_P2

U1_PETS_P3

U1_PETS_P4

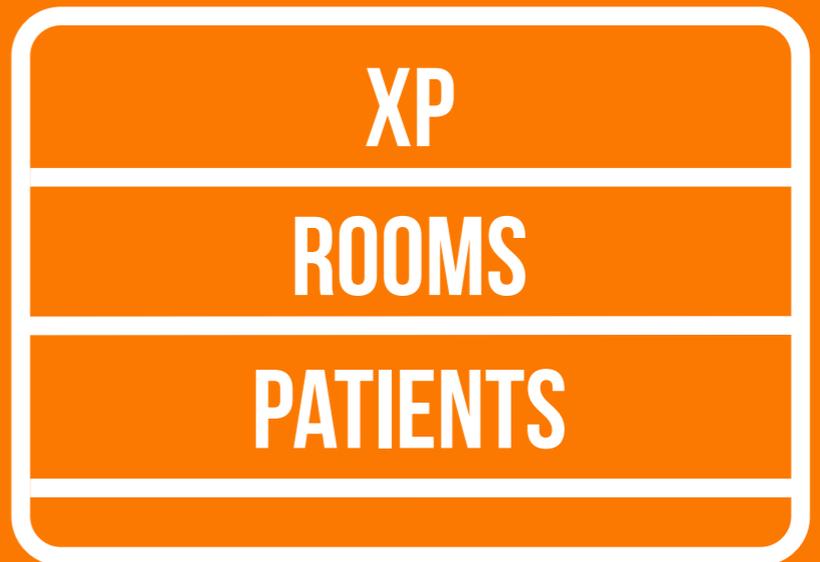
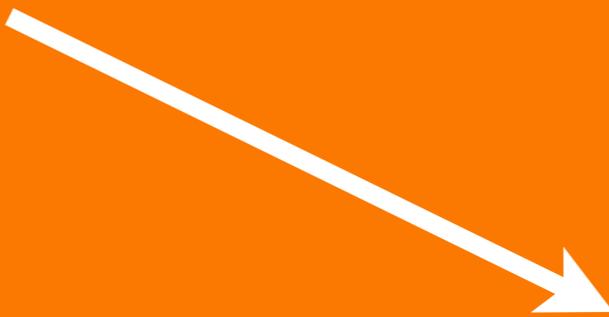
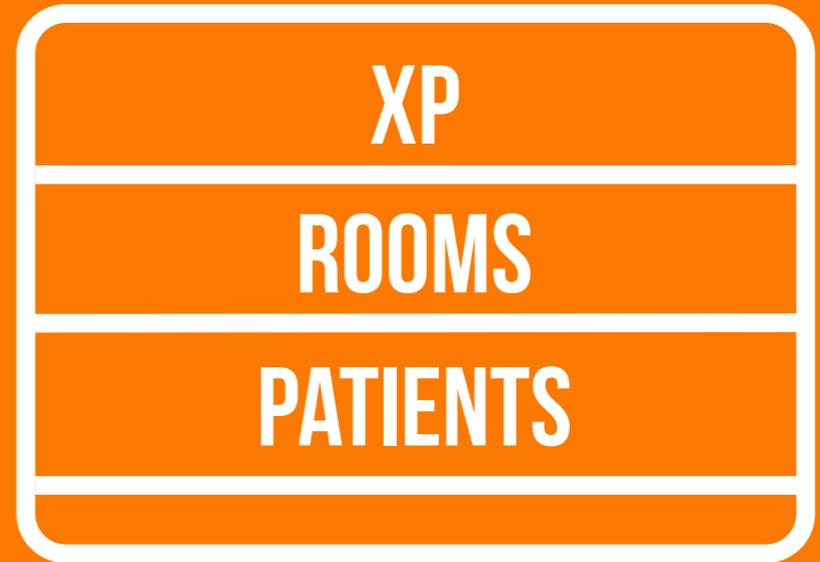
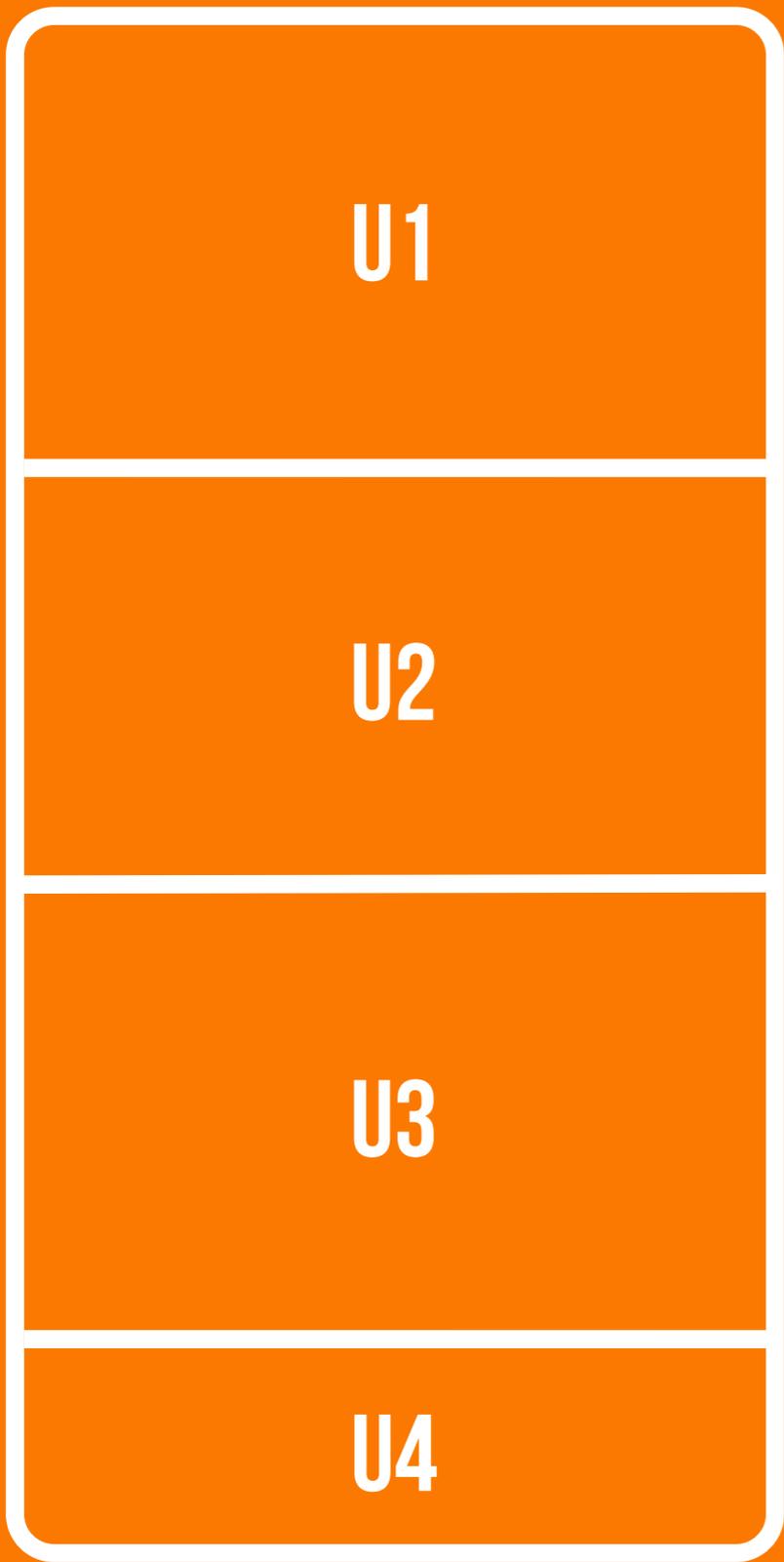
U1_PETS_P5

U2_PETS_P1

U2_PETS_P2

REDIS

HASH



What have we

LEARNED?



Showers are a

MAGICAL

place

Redis is

NOT

a relational database

Compound user data

IS EASIER

to move around







MEMORY

LEAKS?

How does

BGSAVE

work again?

Dumps are
NO LONGER
working





DEAD

END

What have we

LEARNED?

Validate your

ASSUMPTIONS







Fix it with

RESTORE ON

DEMAND

Archive user to

DISK

Restore to

REDIS

Redis

DISK STORE

(never really supported)

What have we

LEARNED?

Less

MACHINES

less complexity

ARCHIVING



*keeps the working set
small*

COMPOUND

*user data is easier to
move around*

TRADE OFF

*Using Redis as your
main data store*



ONE WAY



Bubble
Island



Monster
World

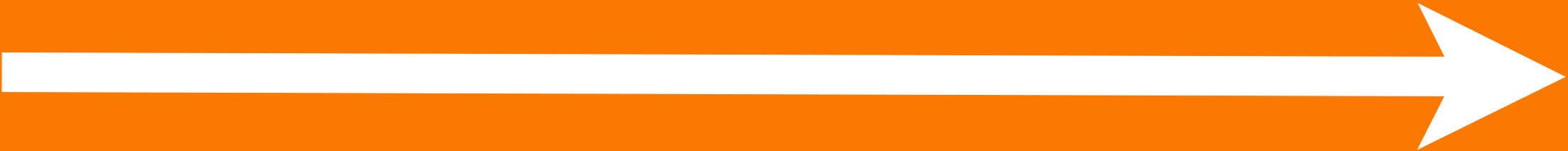


Brain
Buddies



Happy
Hospital

Magic
Land



TIME

Let's go

STATEFUL

NO

DATABASE

is faster than no database

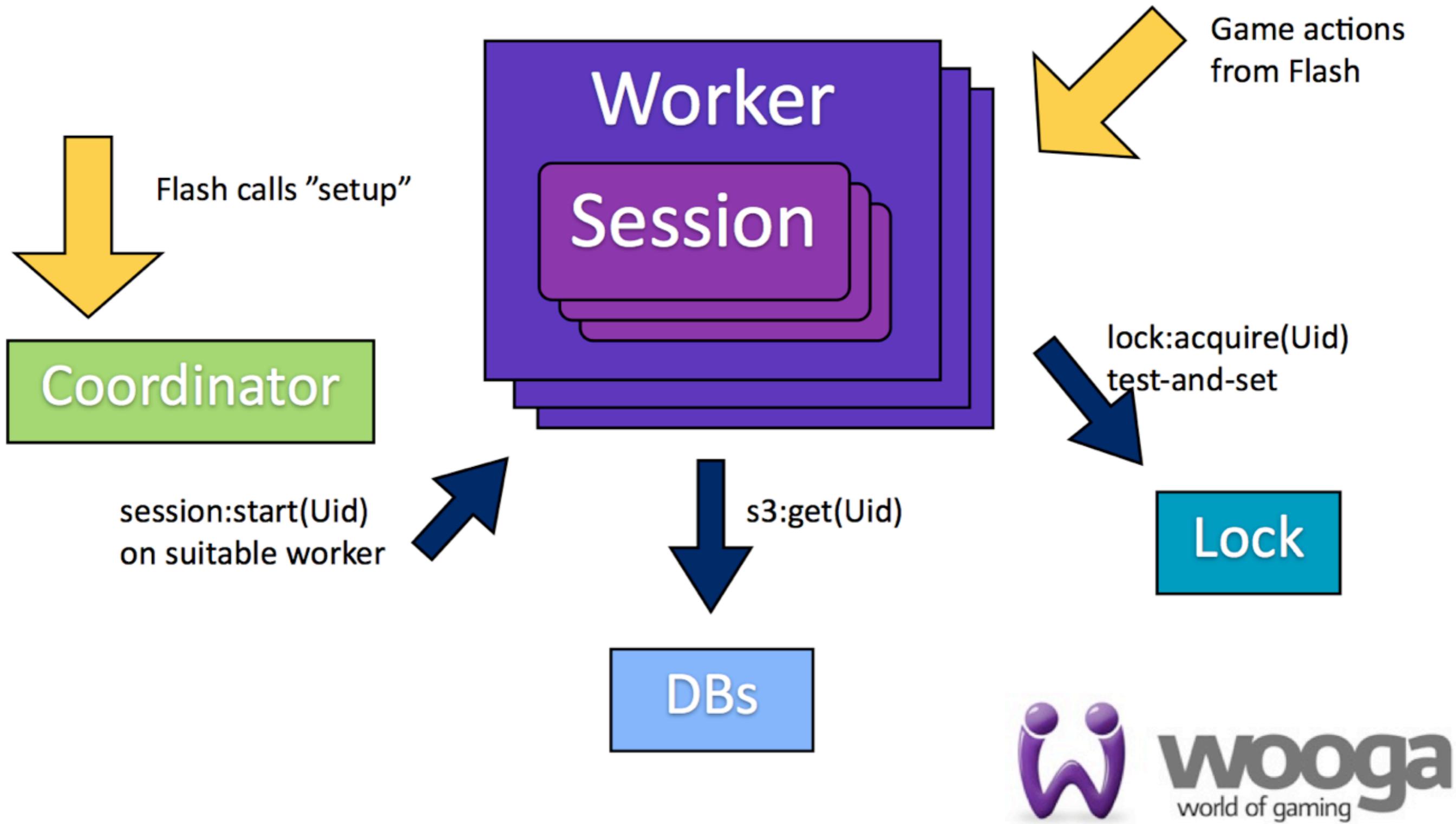
Amazon

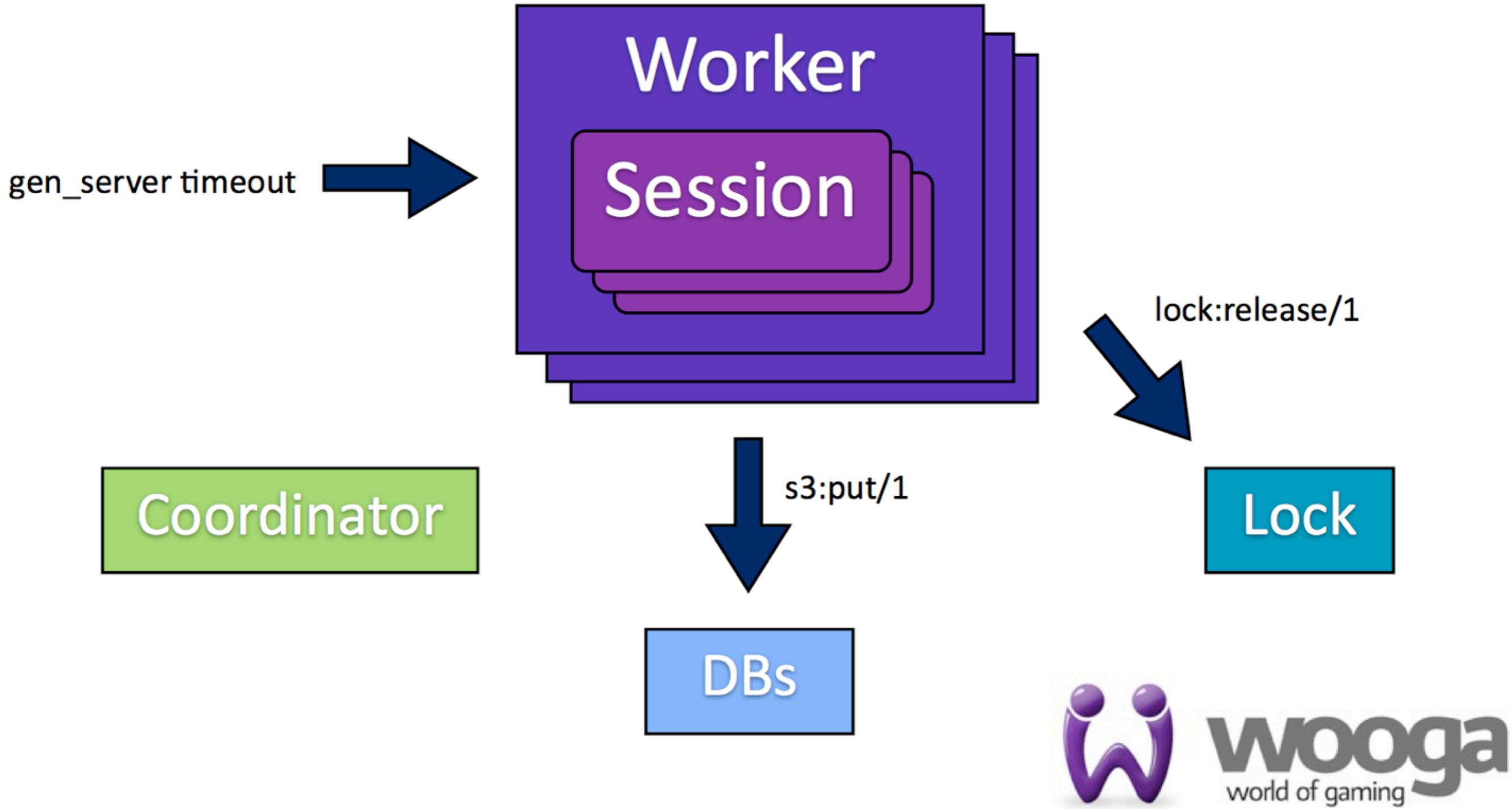
S3





ERLANG







What have we

LEARNED?

ERLANG

*is a great environment
to build distributed
systems*

Architecture

TRUMPS

choice of database

STATEFUL

is more complex

Distributed

LOCKING

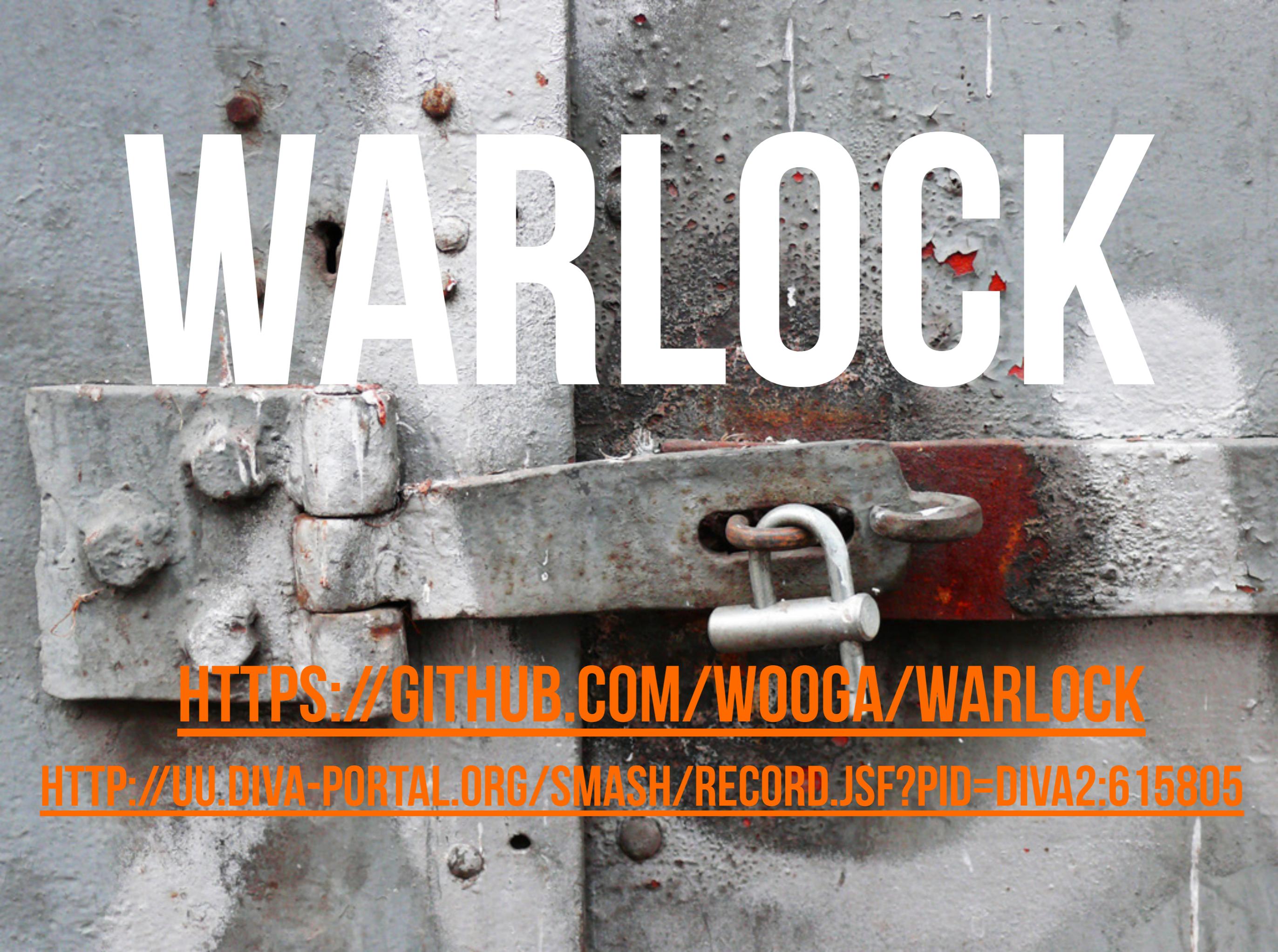
SIPTEL



LOCKER

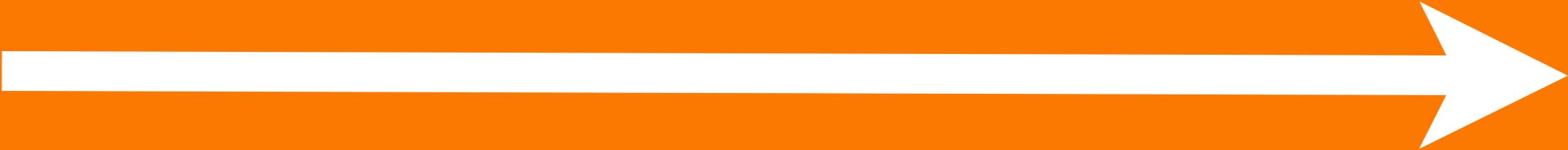
[HTTPS://GITHUB.COM/WOOGA/LOCKER](https://github.com/wooga/locker)

WARLOCK



[HTTPS://GITHUB.COM/WOOGA/WARLOCK](https://github.com/wooga/warlock)

[HTTP://UU.DIVA-PORTAL.ORG/SMASH/RECORD.JSF?PID=DIVA2:615805](http://uu.diva-portal.org/smash/record.jsf?pid=diva2:615805)



TIME





EVENT

MACHINE



basho



riak

LOAD BALANCER

APP

APP

APP

APP

APP

APP

APP

APP

RIAK

RIAK

RIAK

RIAK

RIAK

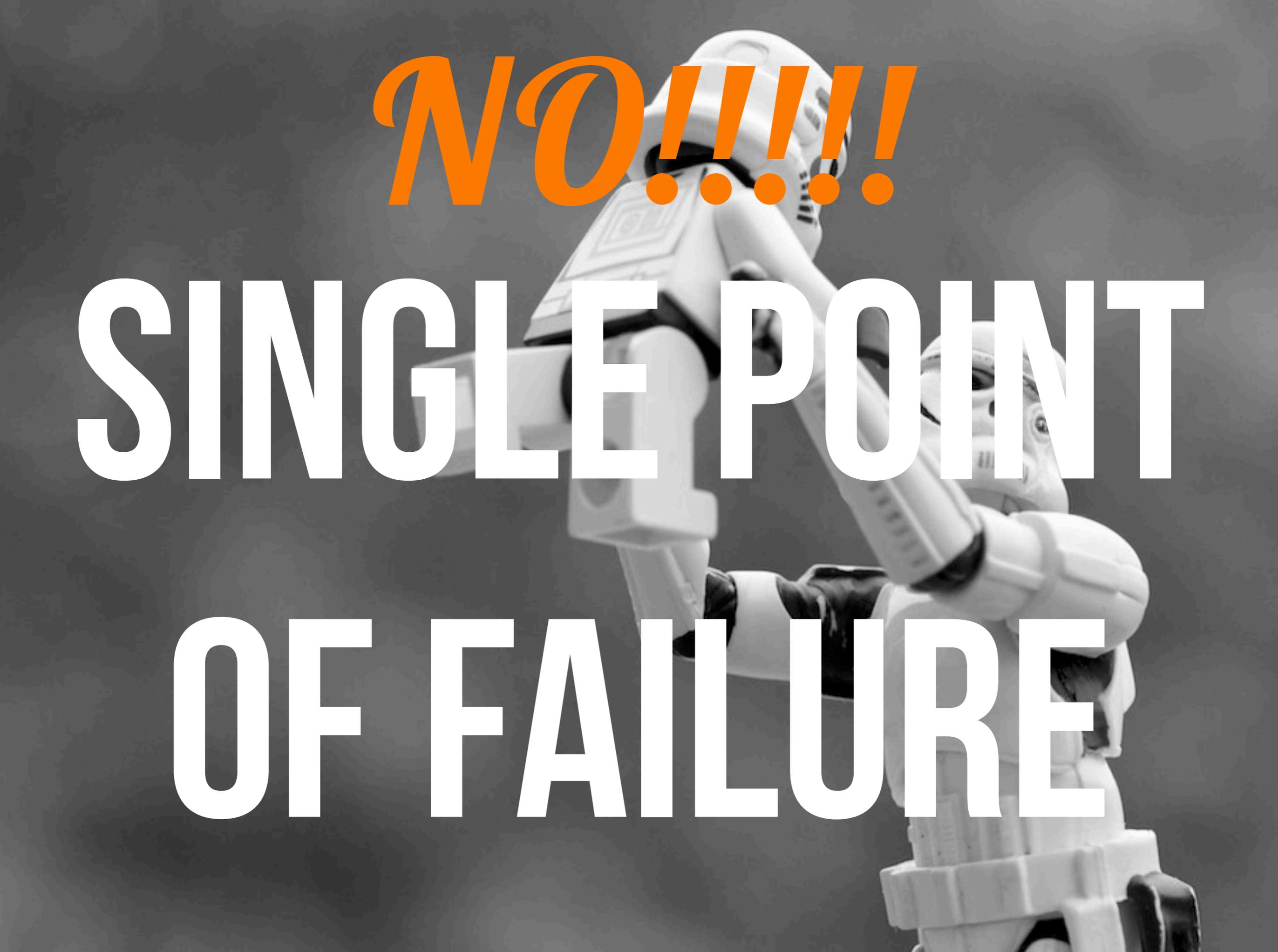
What have we

LEARNED?

Life with

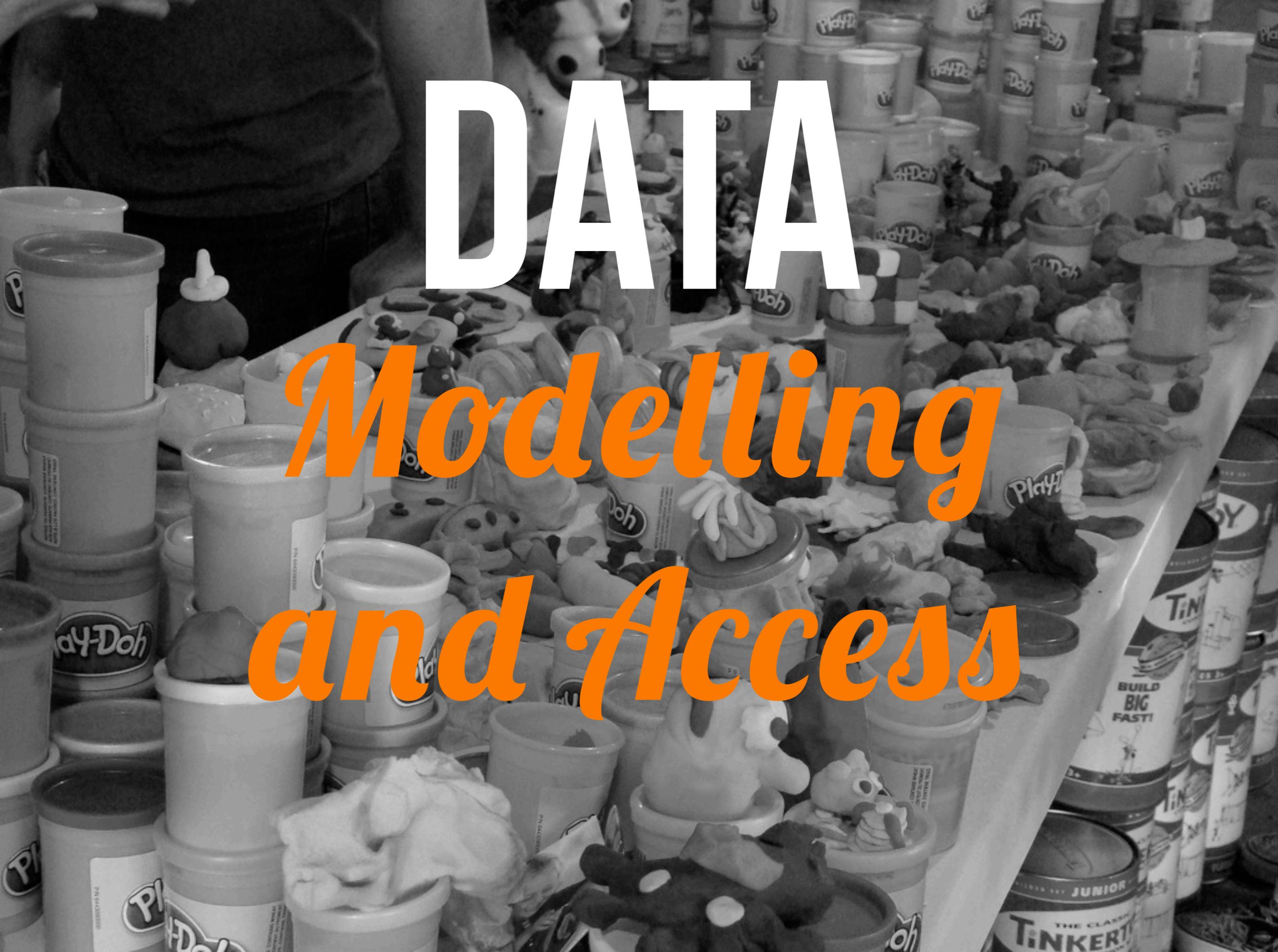
RIAK





NO!!!!!!

**SINGLE POINT
OF FAILURE**



DATA

*Modelling
and Access*

META DATA



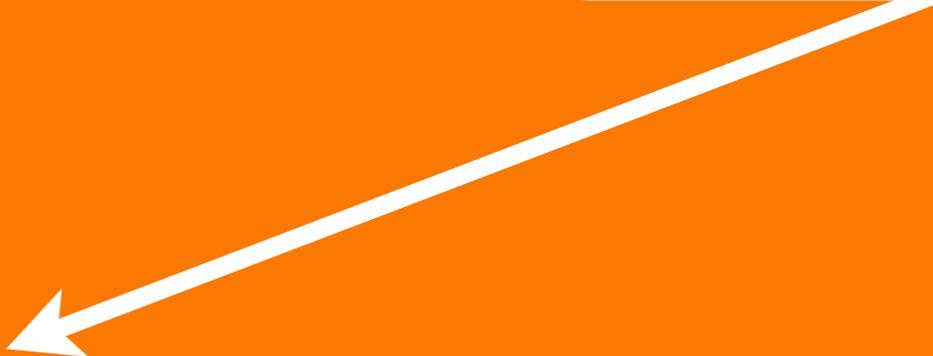
HIGHSCORES



FRIEND INDEX



REDIS



RIAK CLUSTER

Riak

CLUSTER



APP SERVER

RIAK



Riak

BACKUP



A stack of three brown cloth-bound books with white elastic bands. The books are stacked on a light-colored surface. The top book is slightly offset to the right, showing its pages and the binding. The middle and bottom books are partially obscured by the top one.

Archive to

AMAZON S3



QUESTIONS?

PATRICK.HUESLER@WOOGA.COM

[HTTP://WWW.WOOGA.COM/JOBS](http://WWW.WOOGA.COM/JOBS)

REFERENCED PRESENTATIONS

[HTTP://WWW.SLIDESHARE.NET/WOOGA](http://www.slideshare.net/wooga)

[HTTP://WWW.SLIDESHARE.NET/WOOGA/HOW-TO-HANDLE-100000-DAILY-USERS-WITHOUT-USING-A-CACHE-RAILSWAYCON-2012](http://www.slideshare.net/wooga/how-to-handle-100000-daily-users-without-using-a-cache-railswaycon-2012)

[HTTP://WWW.SLIDESHARE.NET/WOOGA/EVENT-STREAM-PROCESSING-WITH-KAFKA-BERLIN-BUZZWORDS-2012](http://www.slideshare.net/wooga/event-stream-processing-with-kafka-berlin-buzzwords-2012)

[HTTP://WWW.SLIDESHARE.NET/WOOGA/FROM-0-TO-100000-DAILY-USERS-WITH-ERLANG](http://www.slideshare.net/wooga/from-0-to-100000-daily-users-with-erlang)

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