



*NoSQL*

**GAMES**



# wooga

**Patrick Huesler**  
**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 +



IV



III



II



I



Shop



Friends

2



Plant



481.150



27

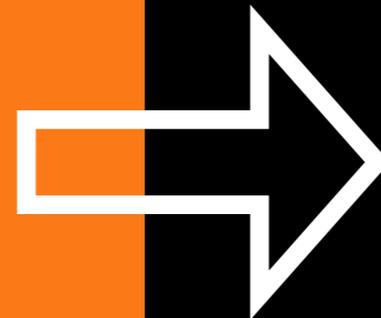
A polar bear and a dog are playing with a large red ball. The polar bear is on the right, holding the ball with its mouth. The dog is on the left, drinking water from a wooden trough. The background is a snowy, outdoor setting.

*How to build*

**GAMES**

**FACEBOOK**

**FLASH**



**GAME BACKEND**

**IOS**

**ANDROID**

# SCALE



*monthly active users*

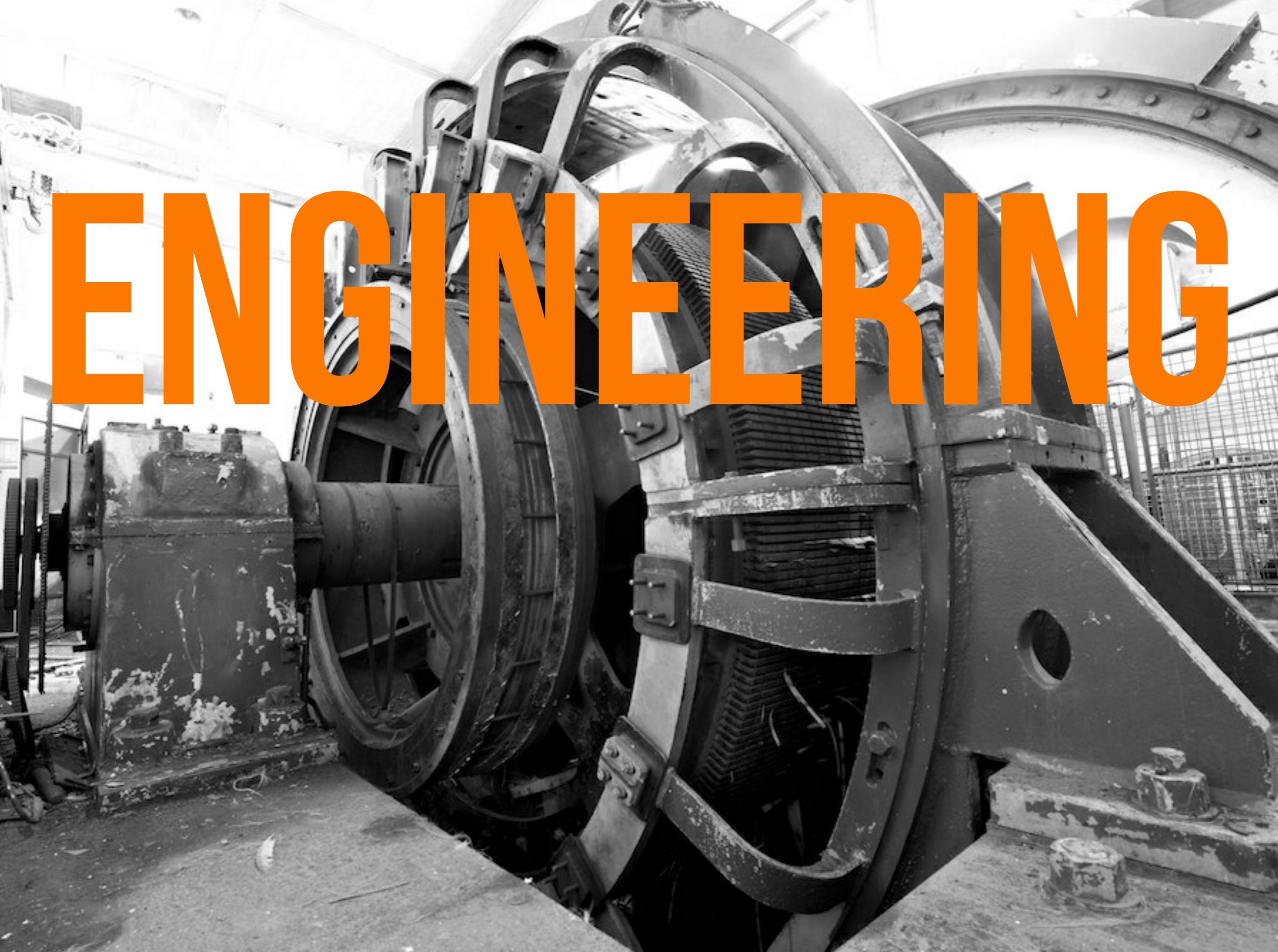
**~28,000,000**

*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 close-up, black and white photograph of a hand holding a computer mouse. The hand is positioned in the center-left of the frame, with the index finger resting on the mouse button. The mouse is dark-colored and has a cord extending from the back. The background is a light, neutral color, possibly a desk or surface, which is slightly out of focus. Overlaid on the image is the word "DEVELOPER" in large, bold, black, sans-serif capital letters, spanning across the top half of the image. Below the word "DEVELOPER", the word "friendly" is written in a smaller, orange, italicized, sans-serif font, positioned over the hand and mouse.

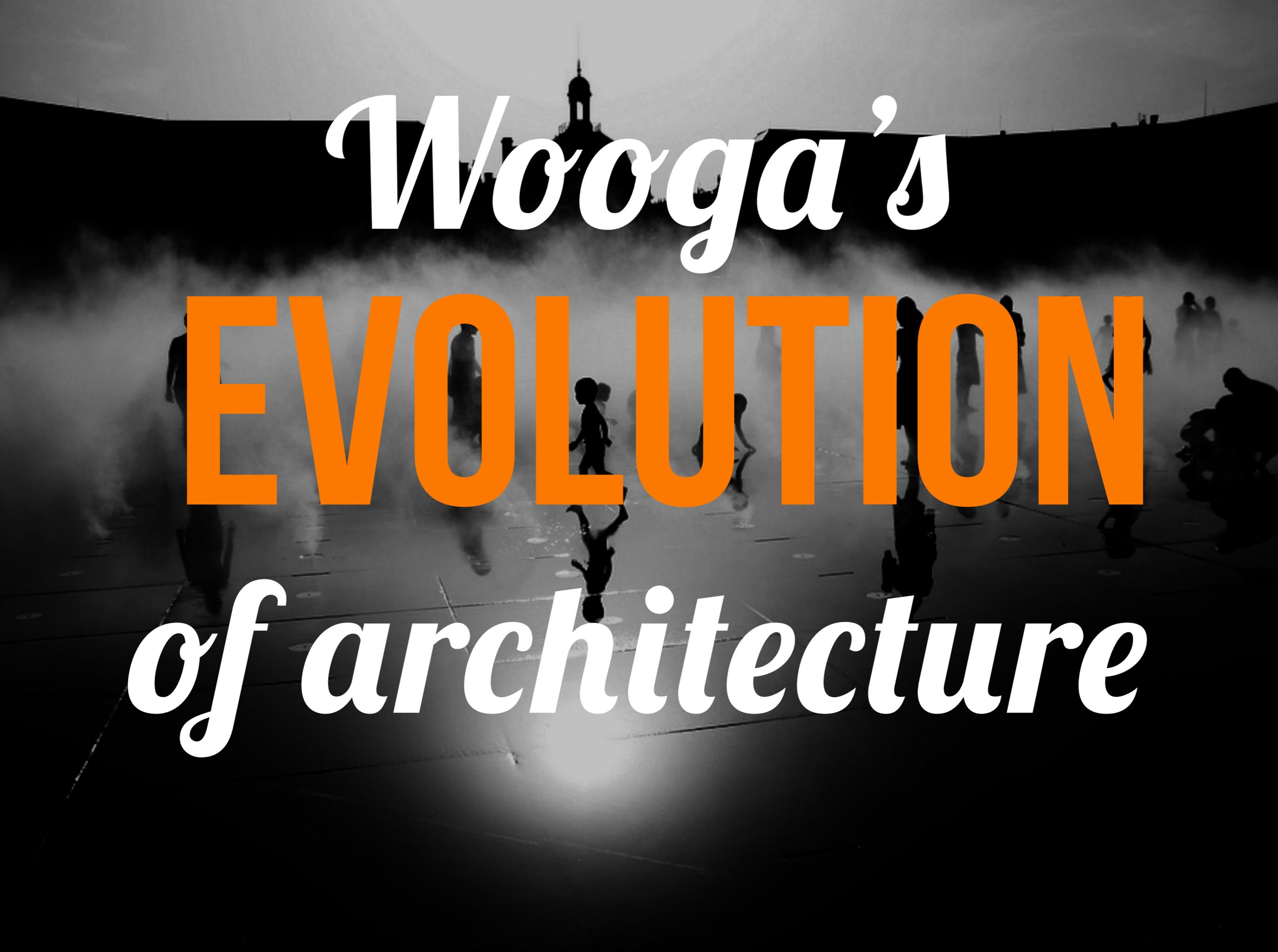
**DEVELOPER**

*friendly*

# OPERATIONS

*friendly*

24R

A black and white photograph of a public square, likely Piazza del Campo in Siena, Italy. The square is filled with people walking, their silhouettes reflected on the wet pavement. In the background, a large building with a prominent dome and spire is visible against a dark sky. The overall atmosphere is dramatic and historical.

*Wooga's*

**EVOLUTION**

*of architecture*

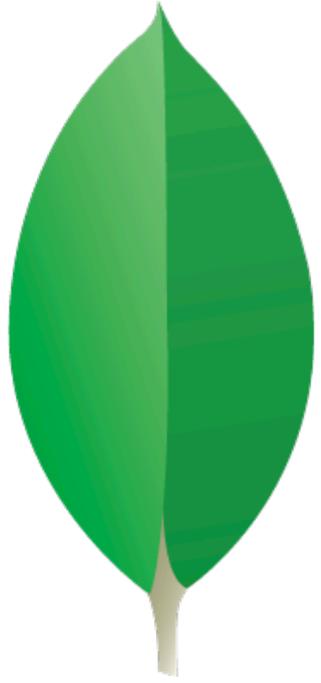


*It starts with a*

**PROTOTYPE**



**CouchDB**  
relax



mongoDB

*Add an*

**ADMIN**

**INTERFACE**

**SIMPLE**

**BACKEND**

**SERVICES**

*Past*

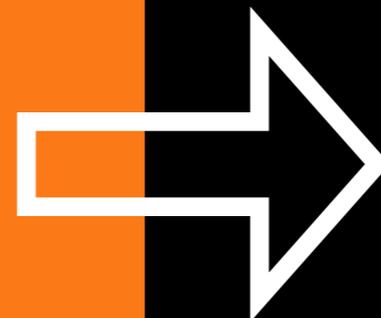
**GAMES**

*1st*

LEARNING

**FACEBOOK**

**FLASH**



**GAME BACKEND  
REPORTING**

**IOS**

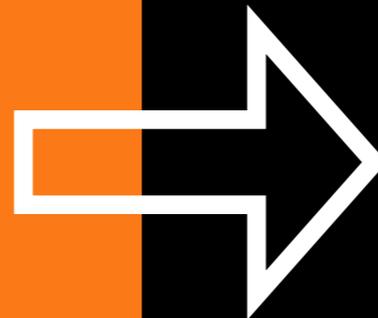
**ANDROID**

**FACEBOOK**

**FLASH**

**IOS**

**ANDROID**



**GAME BACKEND**

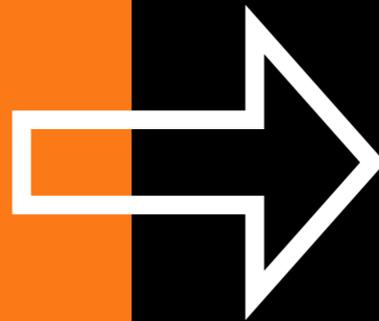
**REPORTING**

**GAME 1**

**GAME 2**

**GAME 3**

**GAME 4**

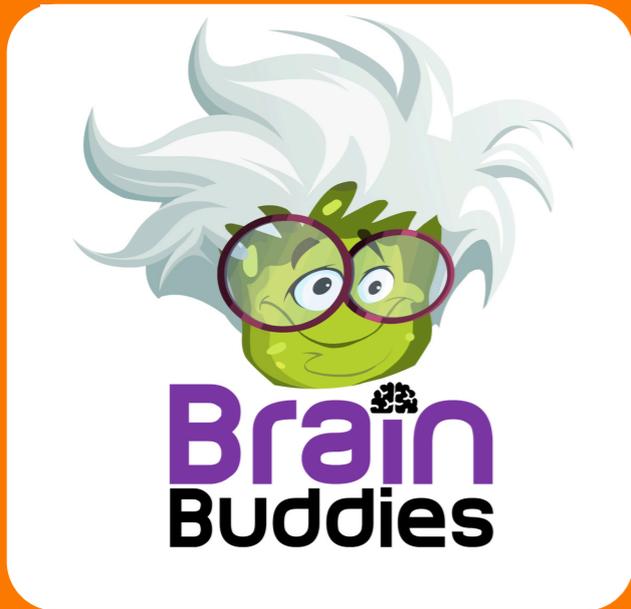


**REPORTING**



# 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**



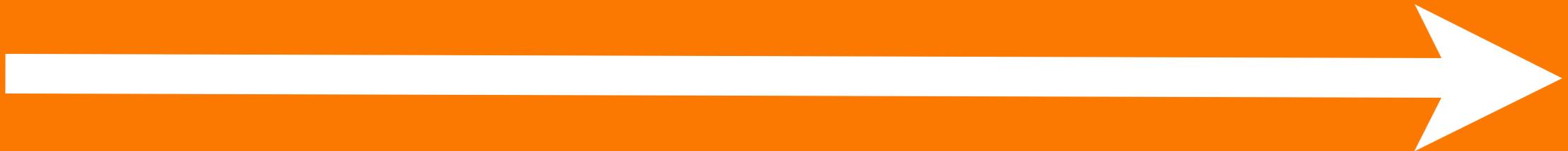
**Bubble  
Island**



**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*

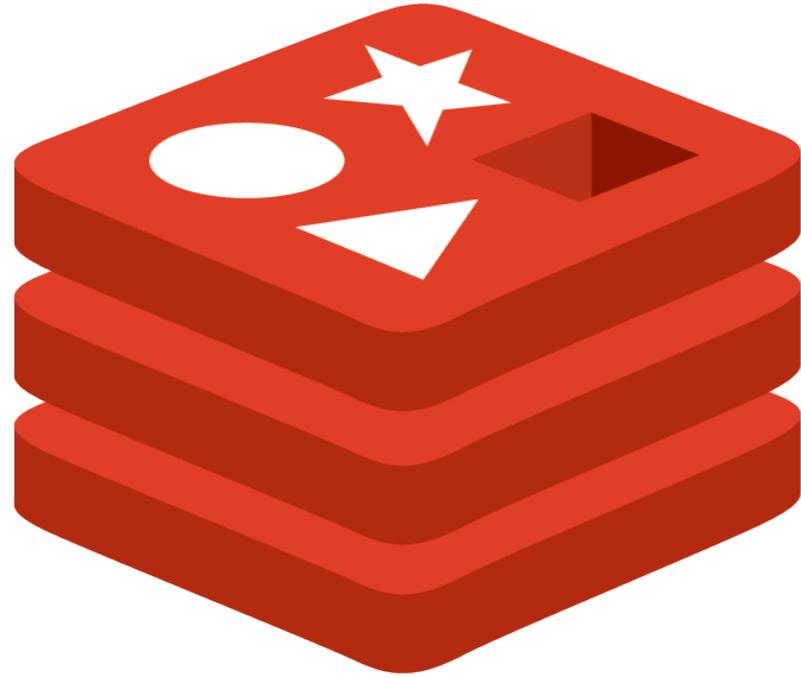
**ARE NOT**

*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*

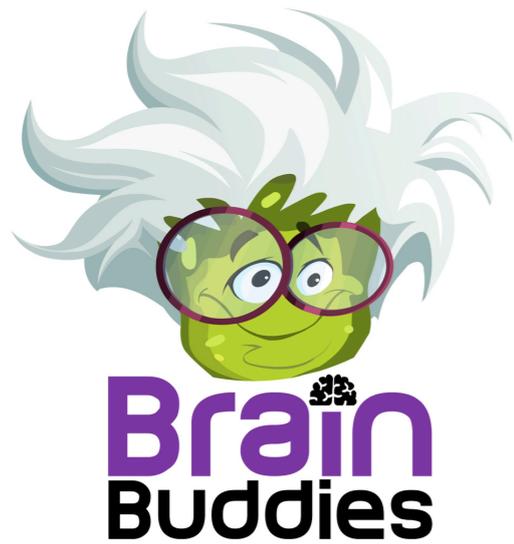
*Incremental*

**ROLLOUTS**

*are easier to reason about*

*monitoring is*

**CRUCIAL**



**TIME**



*Back to*

**DEDICATED**

*Faster*

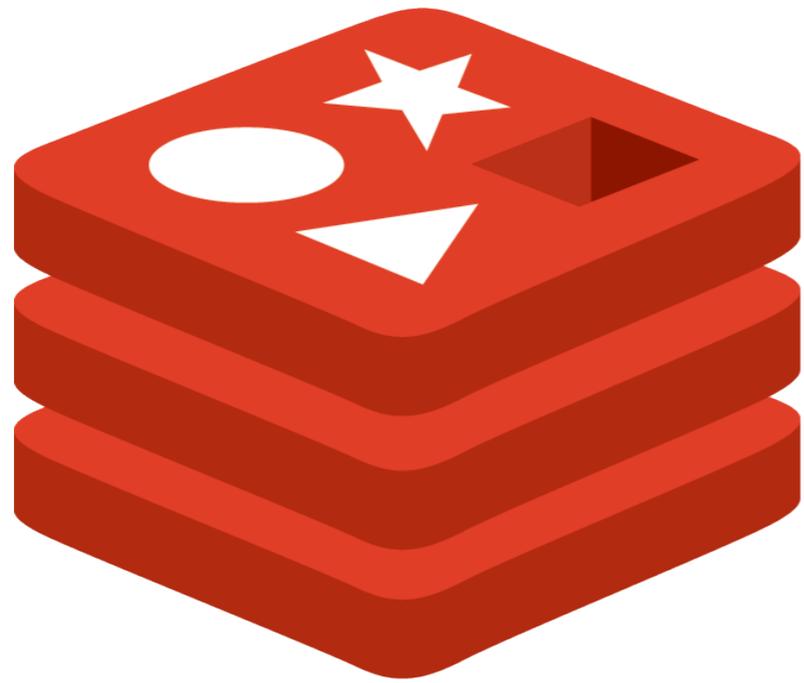
**MACHINES**

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

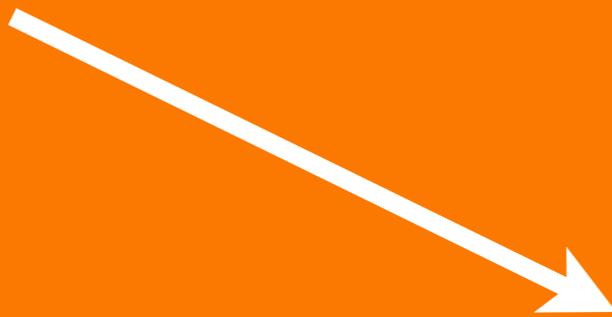
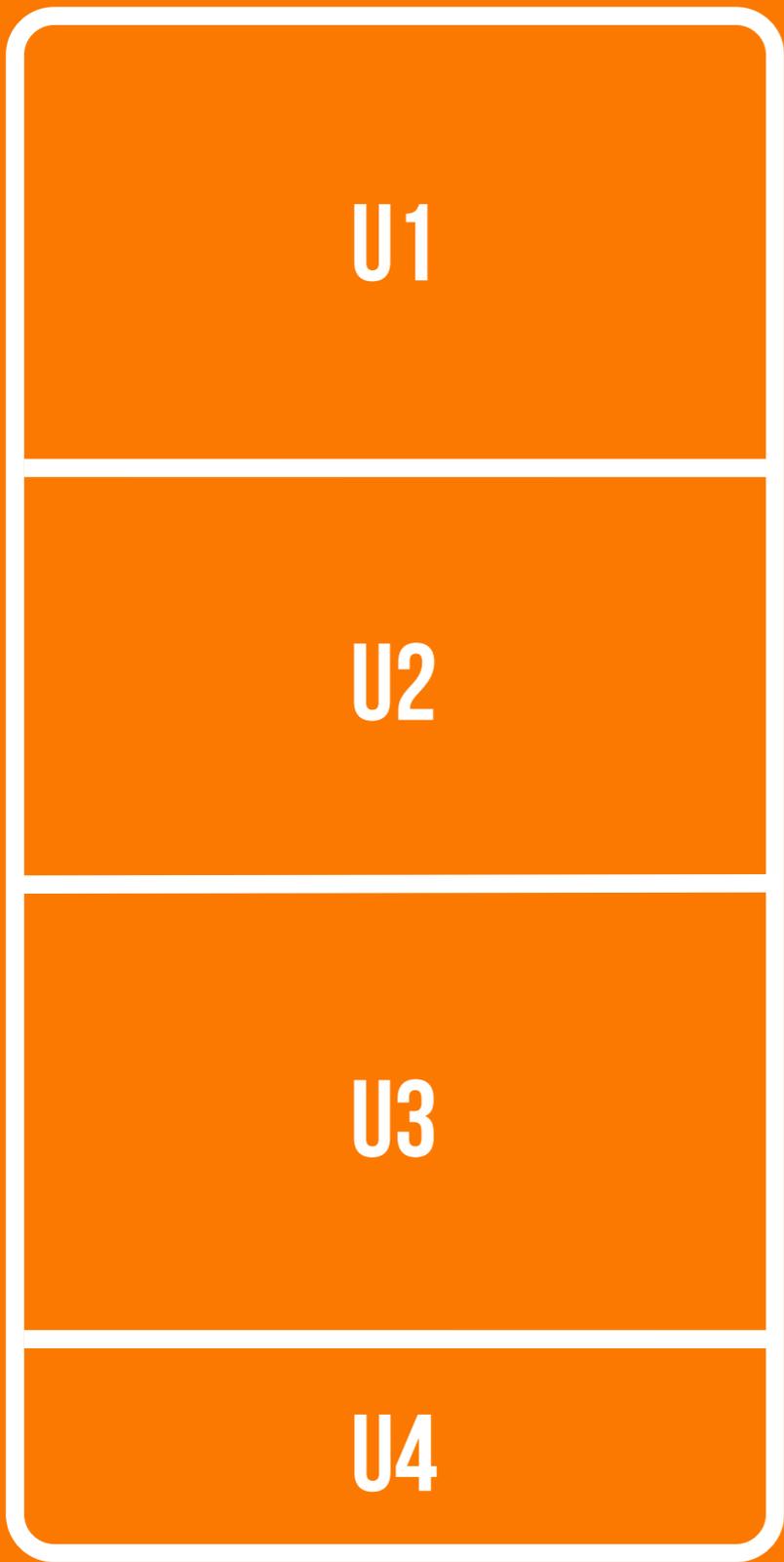
U1\_PETS\_P5

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

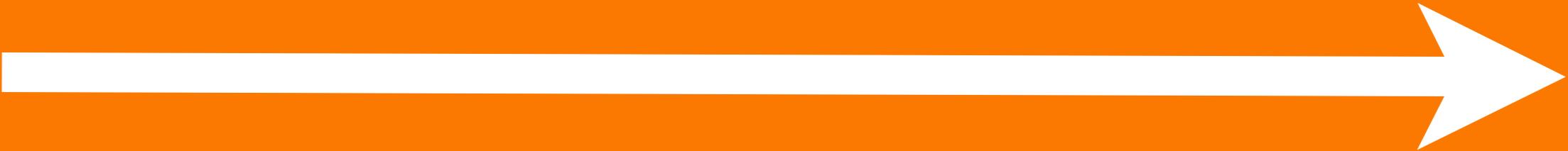


Brain  
Buddies



Happy  
Hospital

Magic  
Land



TIME

*Let's go*

**STATEFUL**

*NO*

**DATABASE**

*is faster than no database*

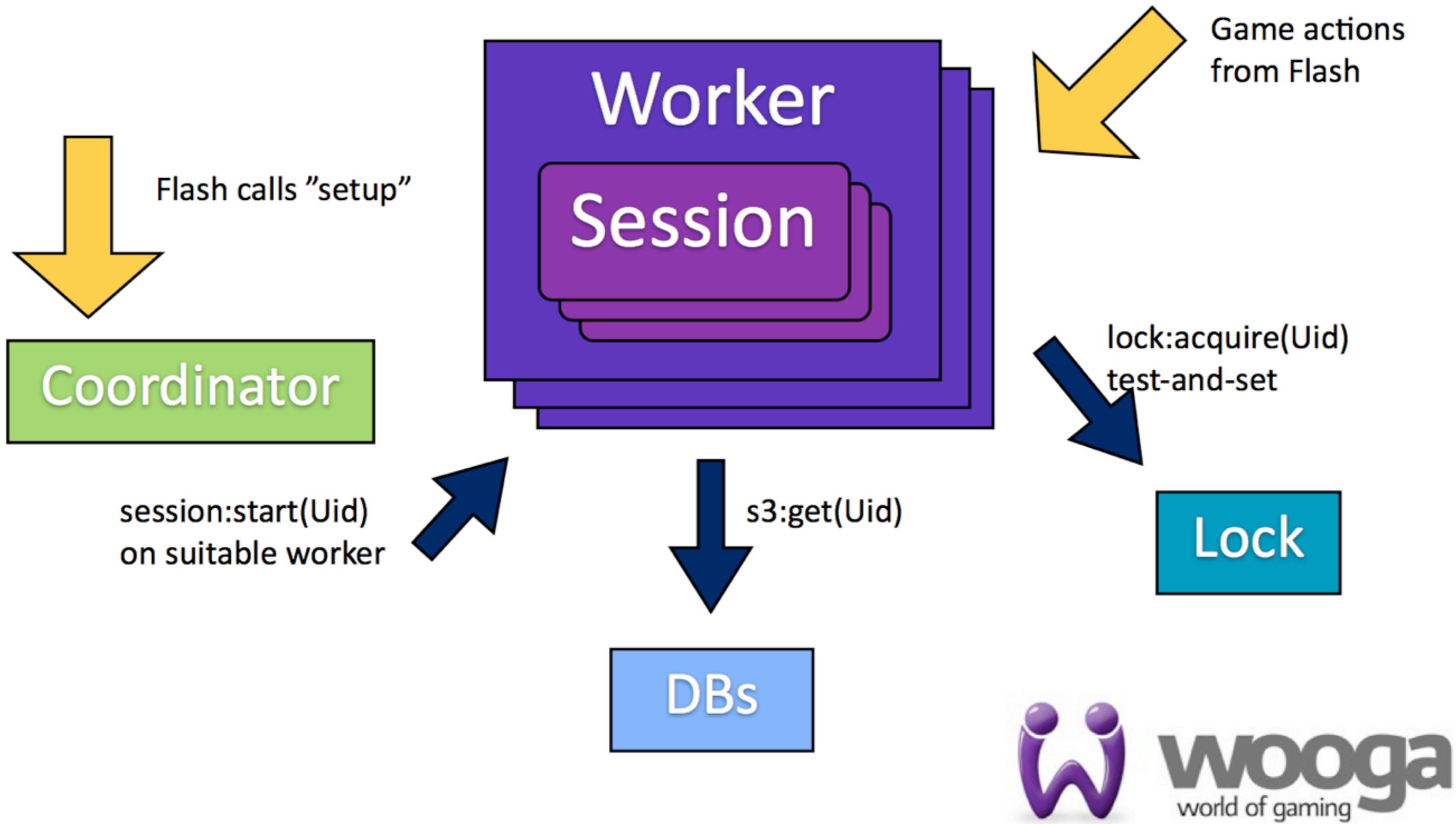
*Amazon*

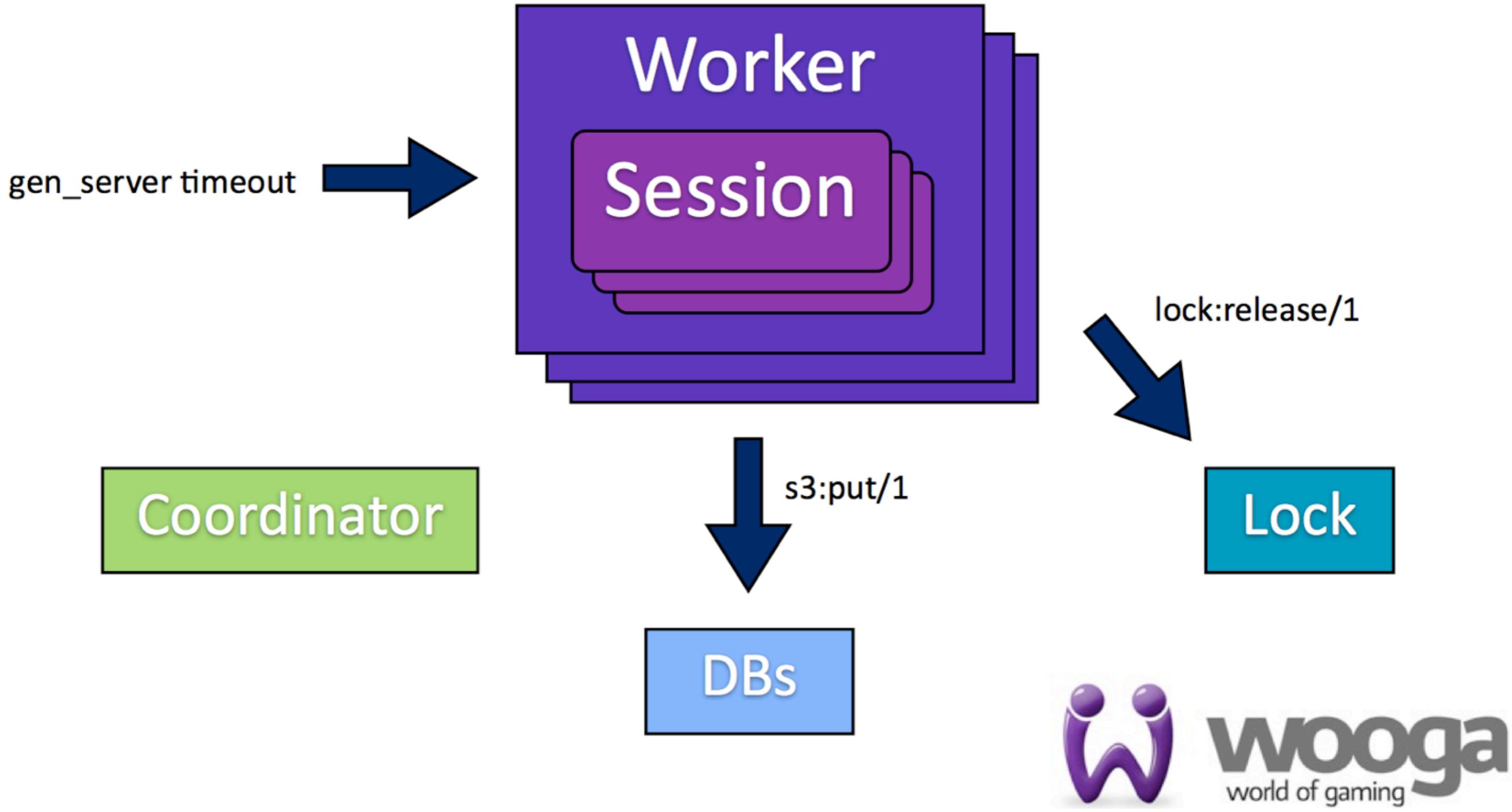
**S3**





**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**

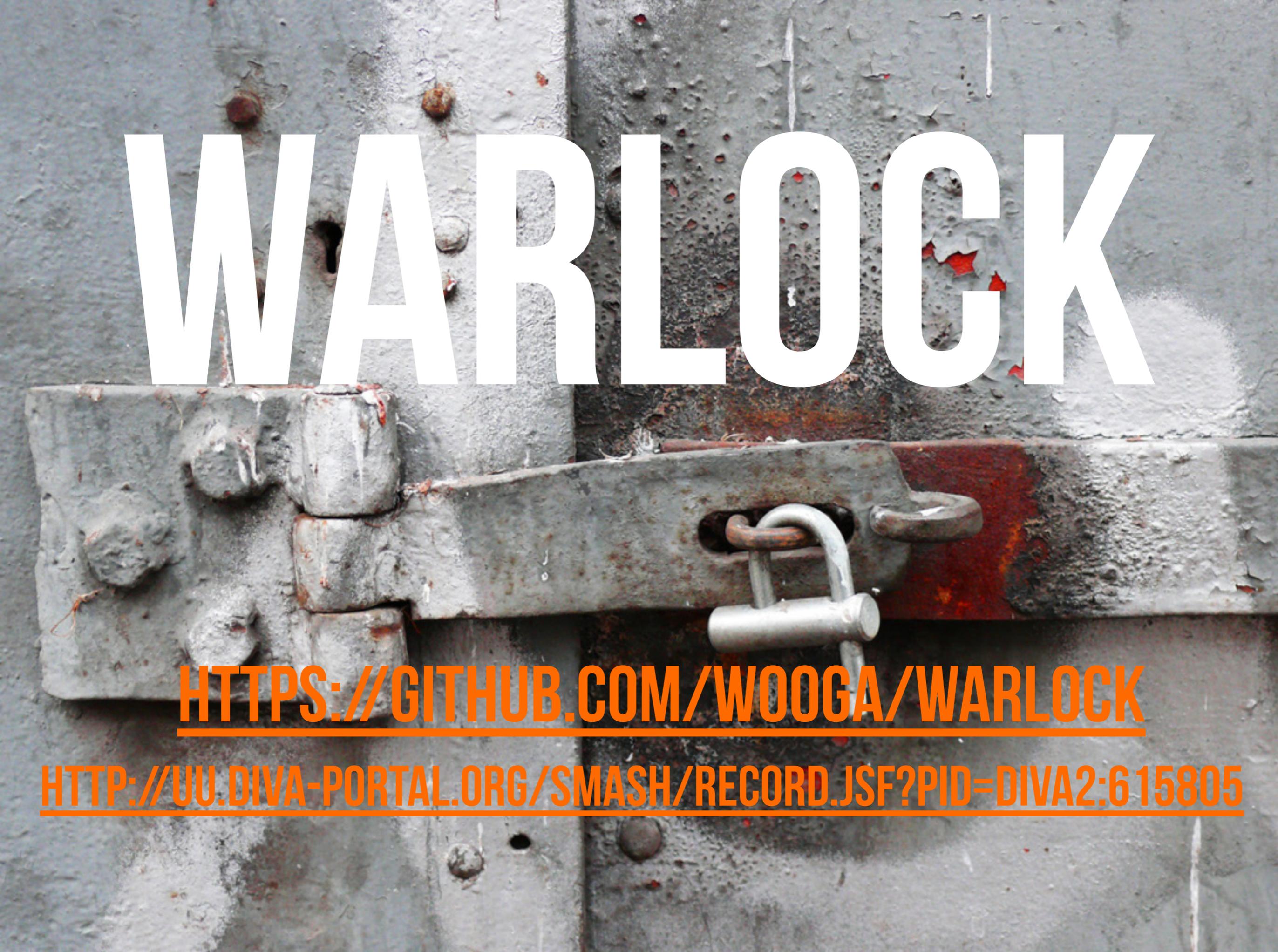
SIPTEL



# LOCKER

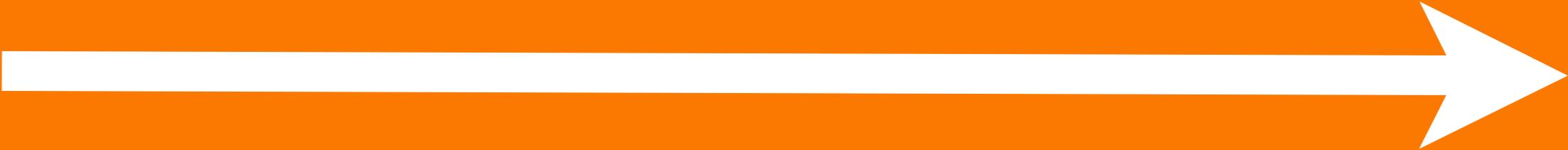
[HTTPS://GITHUB.COM/WOOGA/LOCKER](https://github.com/wooga/locker)

# 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



**RAILS**



**EVENT**

**MACHINE**



**basho**



**riak**

**LOAD BALANCER**

**APP**

**APP**

**APP**

**APP**

**APP**

**APP**

**APP**

**APP**

**RIAK**

**RIAK**

**RIAK**

**RIAK**

**RIAK**

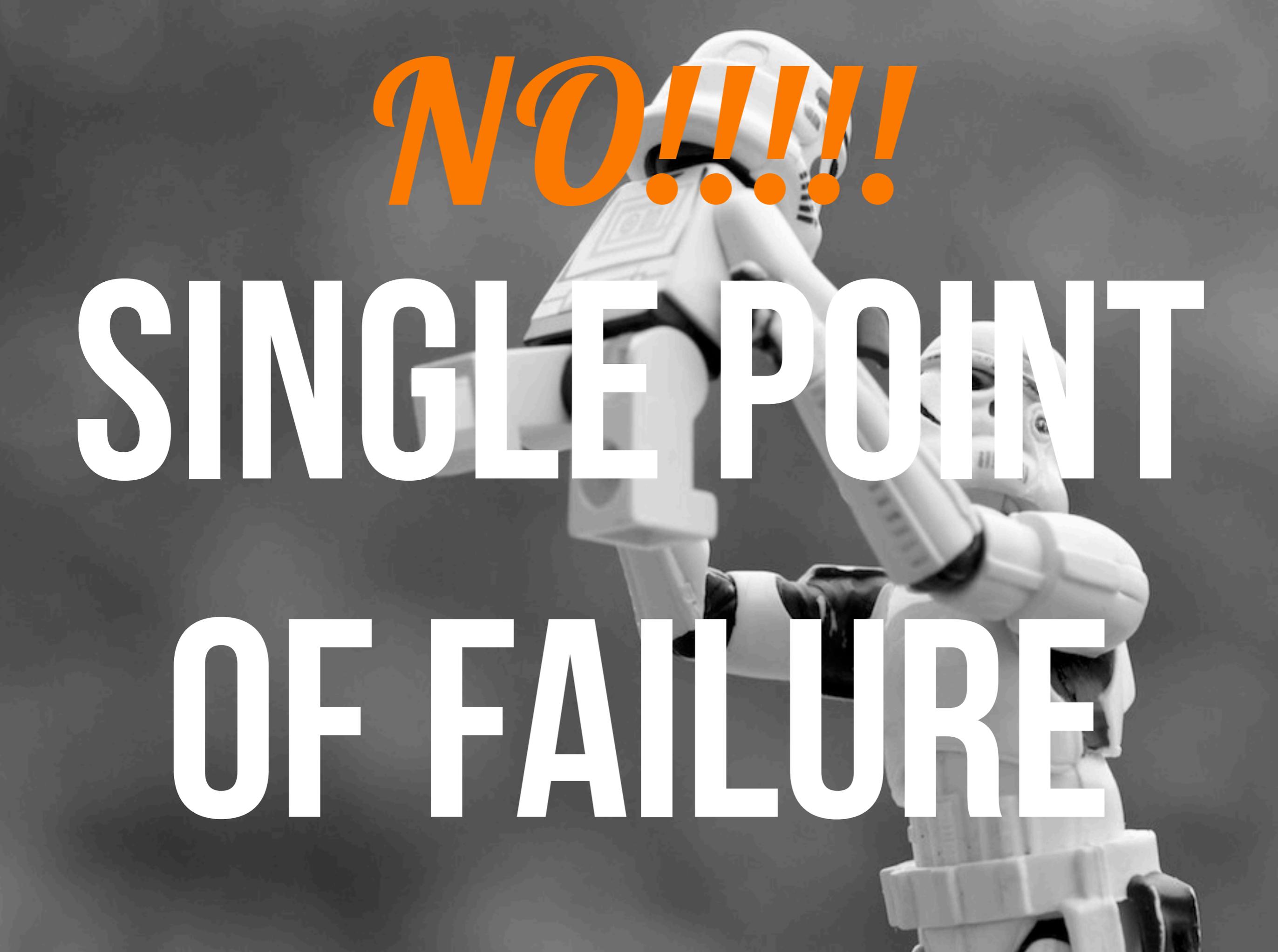
*What have we*

**LEARNED?**

*Life with*

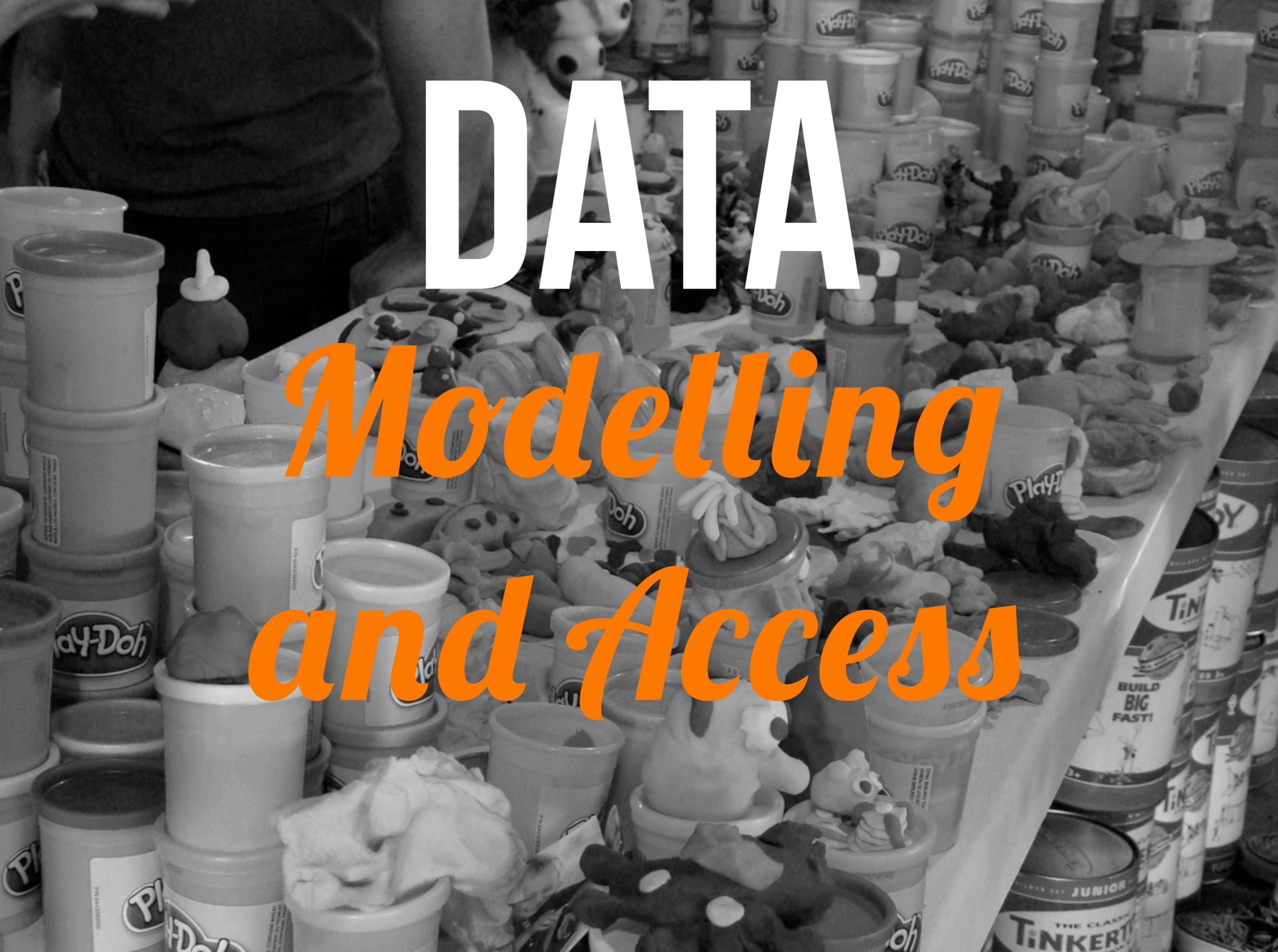
**RIAK**





***NO!!!!!!***

**SINGLE POINT  
OF FAILURE**



DATA

*Modelling  
and Access*

**META DATA**



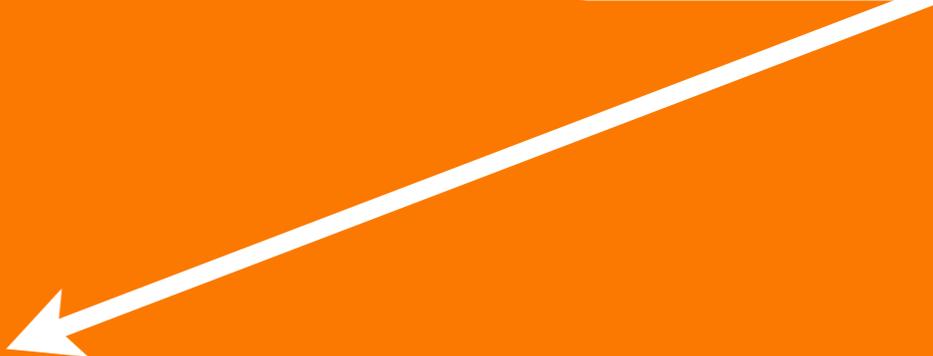
**HIGHSCORES**



**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 book is also slightly offset, and the bottom book is the most prominent, showing its spine and the elastic band.

*Archive to*

**AMAZON S3**



# QUESTIONS?

[PATRICK.HUESLER@WOOGA.COM](mailto: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)

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