



10 (or so) tips for failing at microservices - badly

David Schmitz / @koenighotze

Senacor Technologies

Disclaimers

This is
NOT
about:

you,
your project,
your customer,
my customers,
or any future customer
or project

Anecdote
IS NOT
Evidence

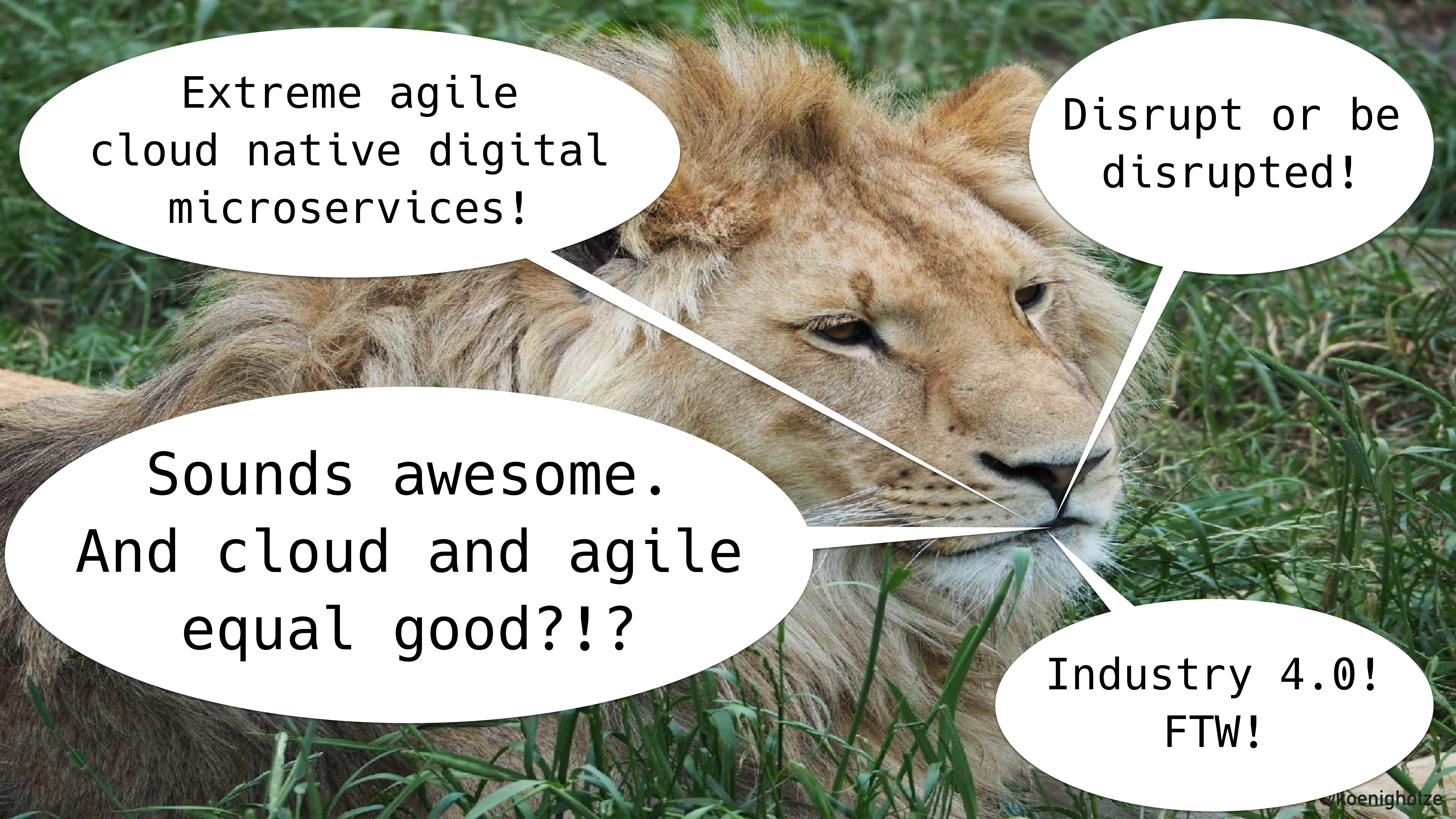
So, what's in it for
you?

Your boss wants to modernise

You don't want to modernise

Things to do to sabotage your project

So...your **BOSS** read
about **microservices**?



Extreme agile
cloud native digital
microservices!

Disrupt or be
disrupted!

Sounds awesome.
And cloud and agile
equal good?!?

Industry 4.0!
FTW!

“IT People! **Make it happen!**
Build me some **microservices**”

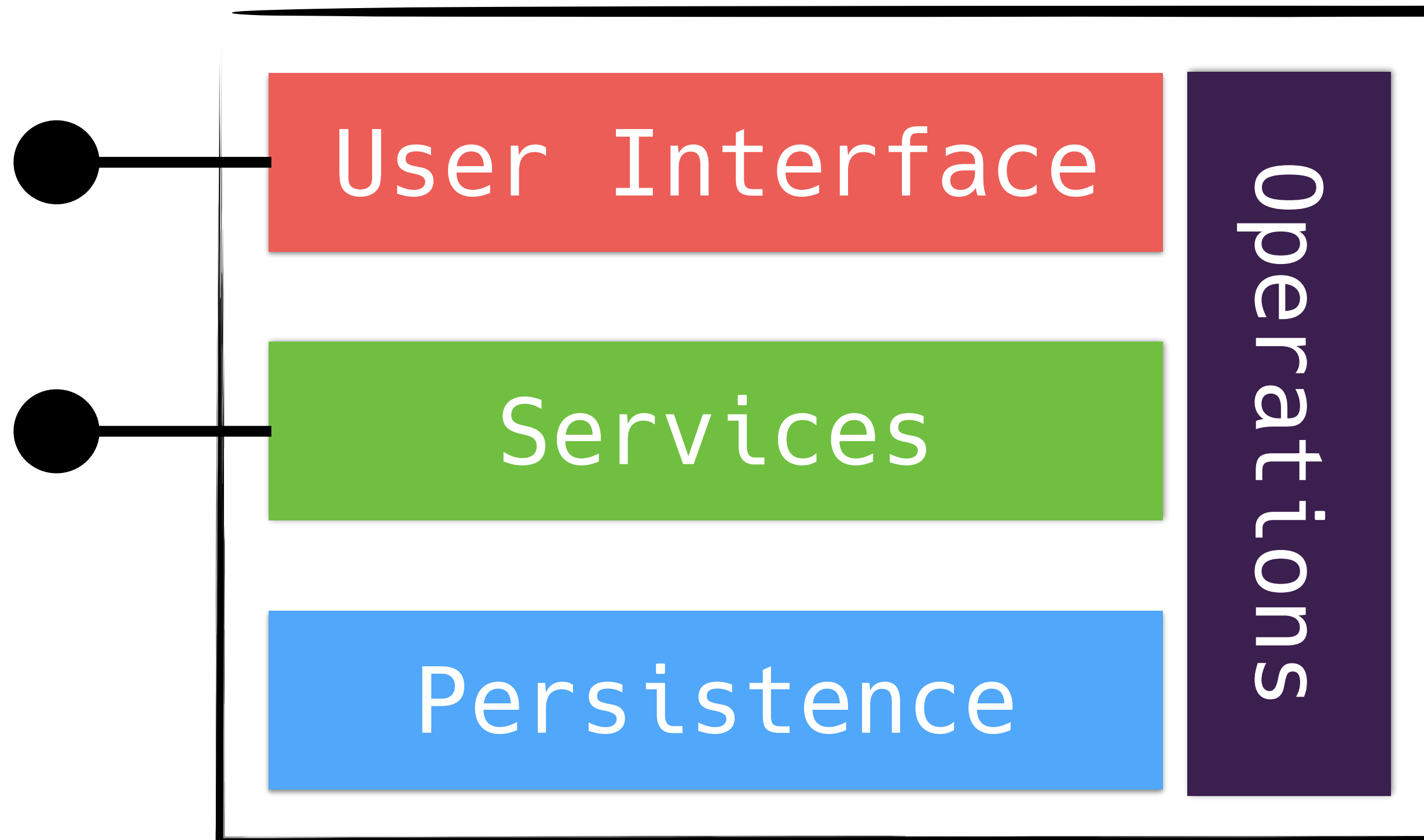


What the hell is a microservice and why should I care?

Google Search

I'm Feeling Lucky

Microservices



Single bounded context

UI and services

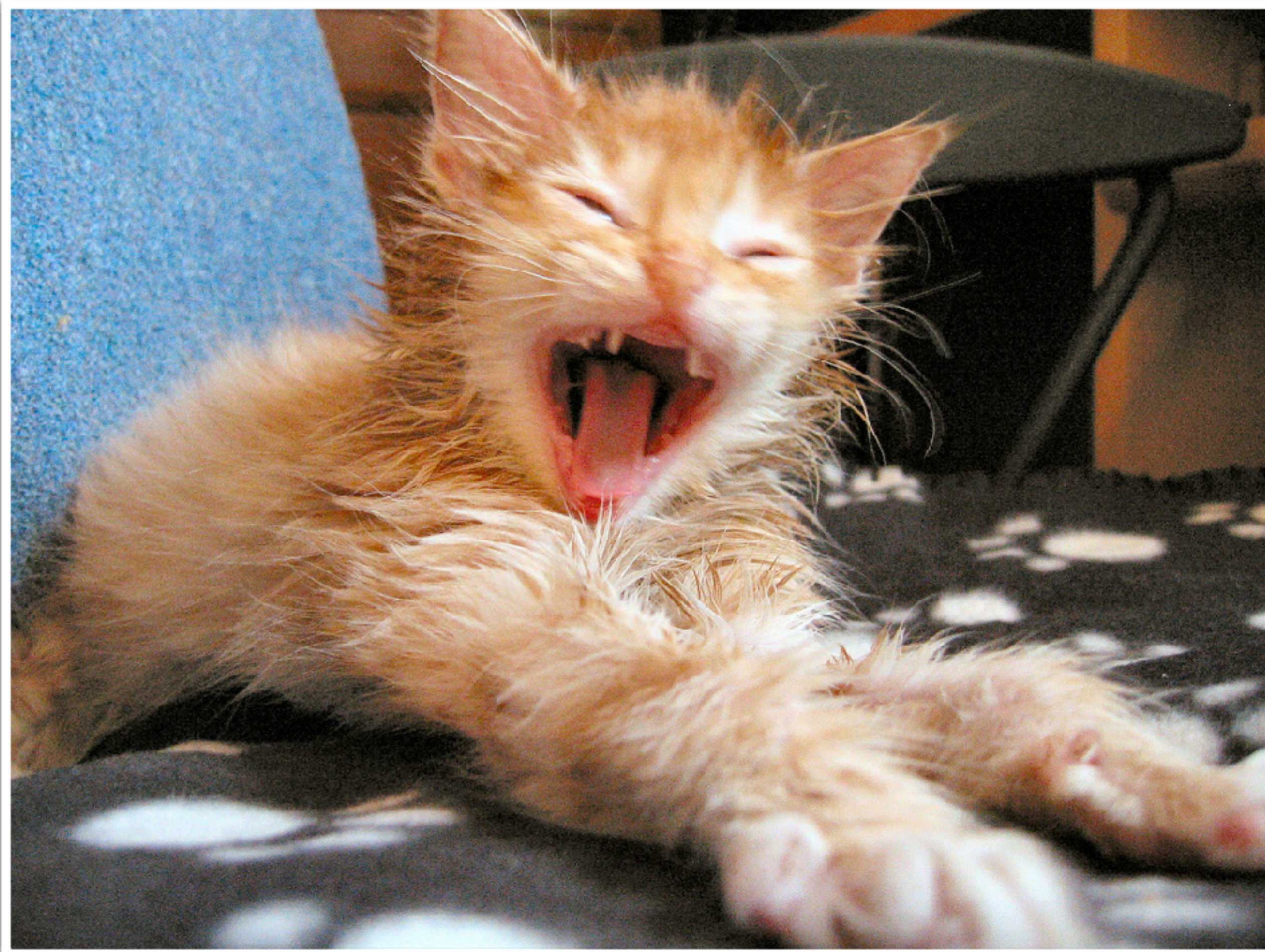
Independent

Self-contained

Local storage

Share nothing

BLAH BLAH...



Too lazy to actually read all this stuff...looks boring and I want to look at funny cat pics.

Just ask yourself...



Do you prefer change...

A hammock is strung between two trees on a sandy beach. The hammock is made of light-colored rope with wooden slats. The background shows a clear blue ocean and distant mountains under a cloudy sky. A semi-transparent dark grey banner is overlaid across the middle of the image.

...or rest?

Sabotage **countdown**

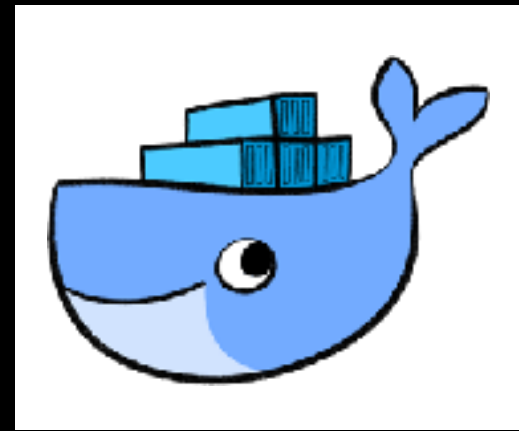
10

A large, festive crowd of people, many wearing red and white costumes and hats, celebrating at night. The crowd is dense, with many people raising their arms and shouting. The scene is illuminated by bright lights, creating a vibrant and energetic atmosphere. The text "Go full scale polyglot" is overlaid in white on a dark horizontal band across the center of the image.

Go full scale polyglot

Where is Waldo?





Still **successful**?

Semantic Versioning

Major.Minor.Bugfix


```
$ npm ls | grep @0
```

ui-broker@0.1.0

| └─ fbjs@0.8.8

| | └─ encoding@0.1.12

| | └─ iconv-lite@0.4.15

| └─ ua-parser-js@0.7.12

└─ react-scripts@0.8.5

| └─ normalize-range@0.1.2

| | └─ json5@0.5.1

| | └─ ...

William-Wallace-Tribute-team!

Groundhog code

Maintenance field trips

Synergies: polyglot UI with beta status

Find new friends on Stackoverflow

Heisenops

Polyglot?

Poly  WTF

thx @Codepitbull

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The data monolith





Mathias Verraes

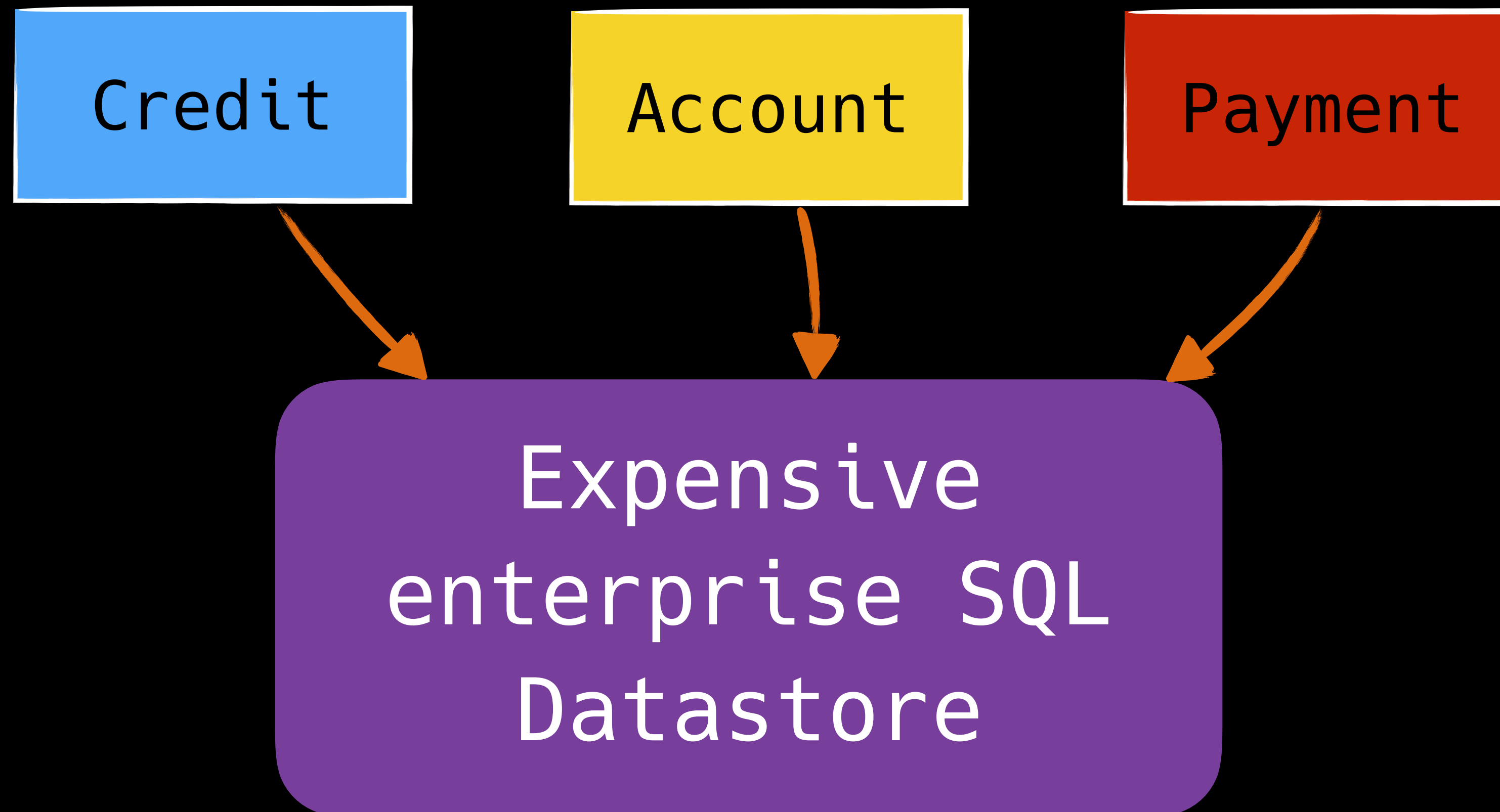
@mathiasverraes

 Follow



. @ziobrando Here's a diagram of two microservices and their shared database.

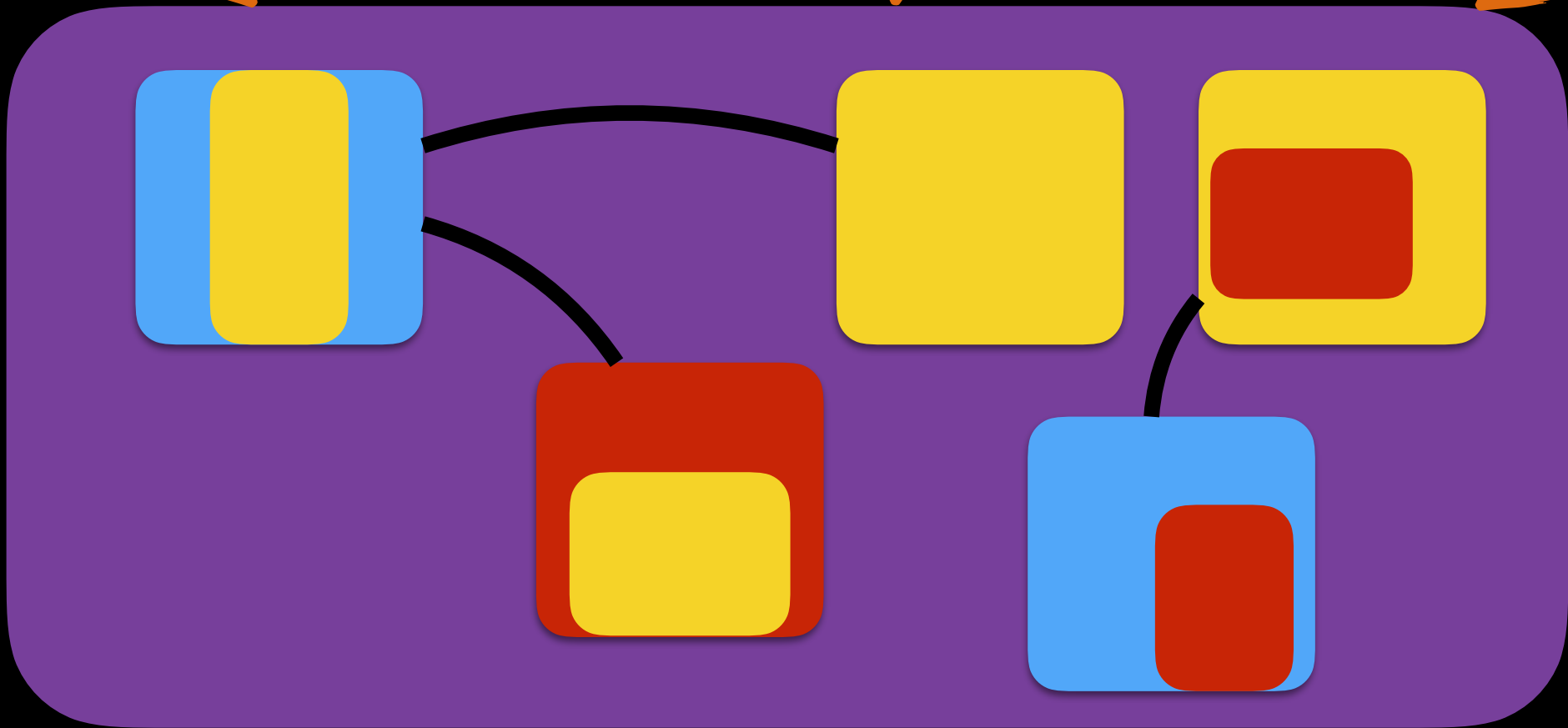




Credit

Account

Payment



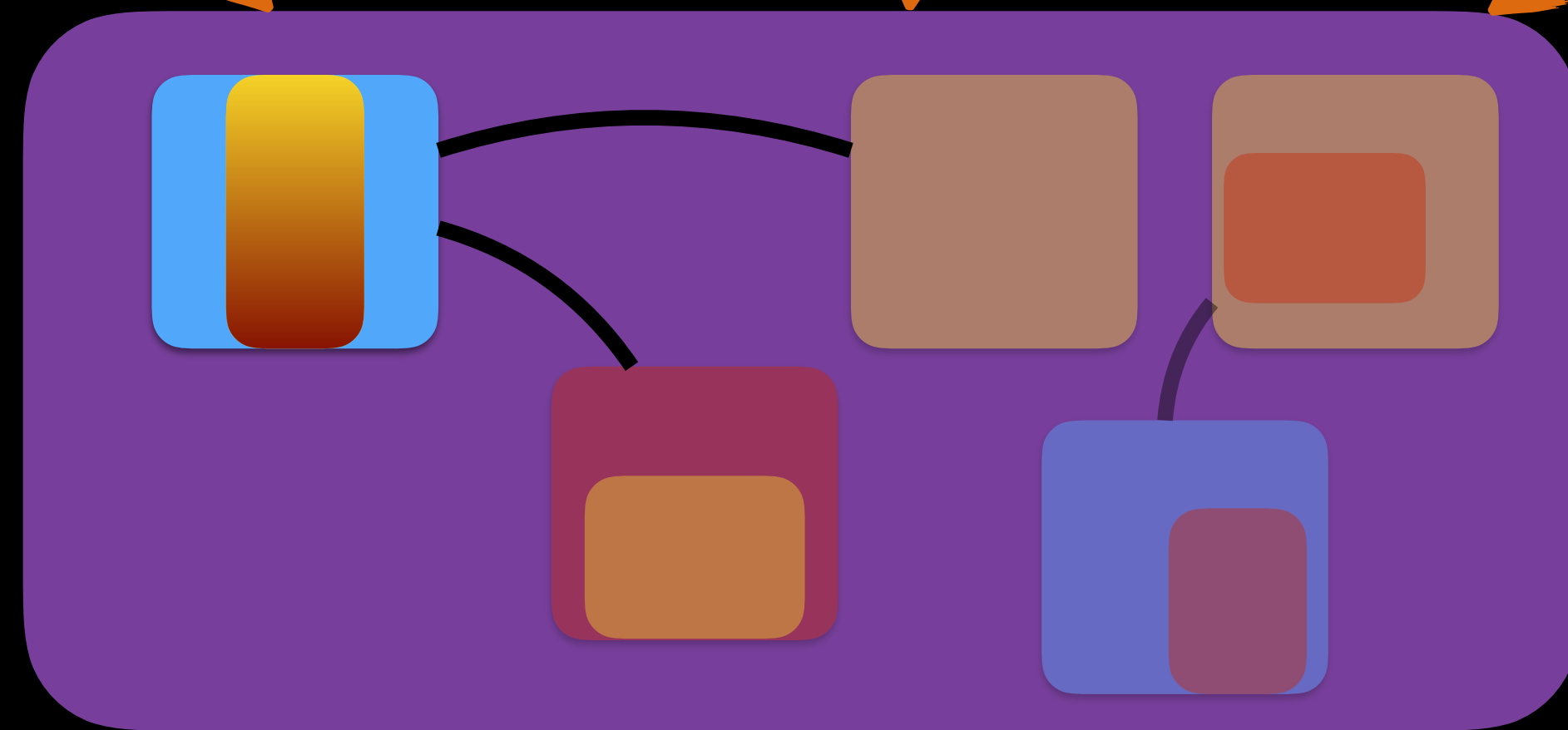
Account name must be
VARCHAR(200) instead of
VARCHAR(50)





Account

Payment



Sharing is a **Good Thing™**

Avoid table or schema **ownership**

Ubiquitous **domain modelling paralysis**

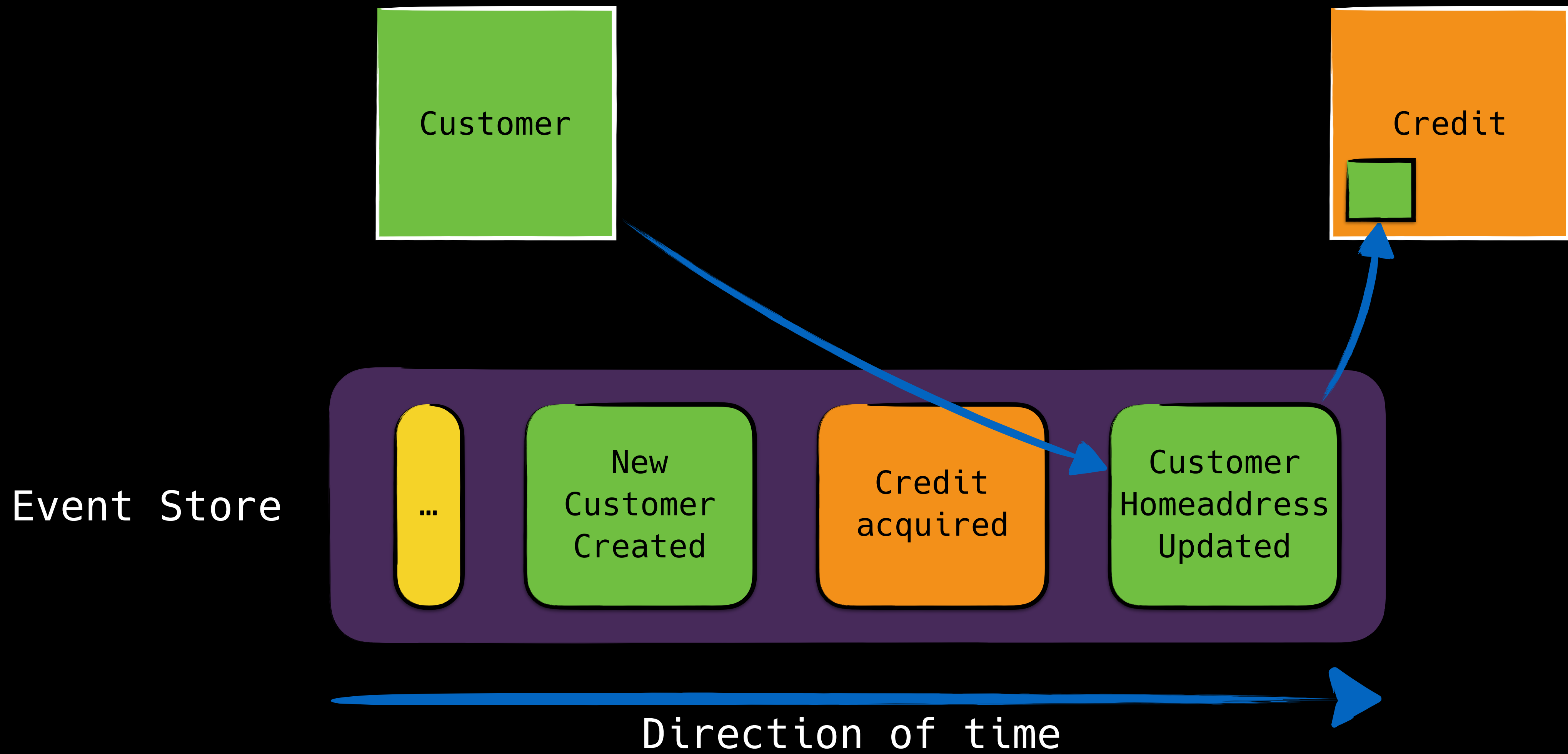
Keep people awake at night with
insidious dependencies

8



The event monolith

Eventsourcing marketing pitch



Audit trail - immutable history for free

Distributed data management

Decoupled microservices with CQRS

...and much more!

**'Das schöne
Österreich'** will no longer be
accepted as a country code

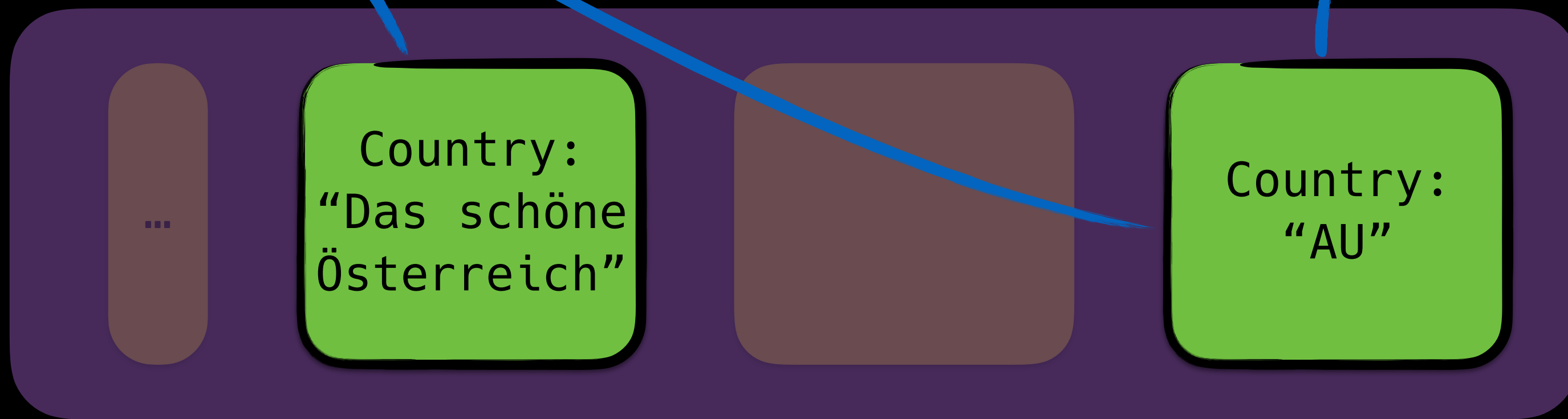


Customer

```
unless ISO.is_country_code(cnt) do
  |...
end
```

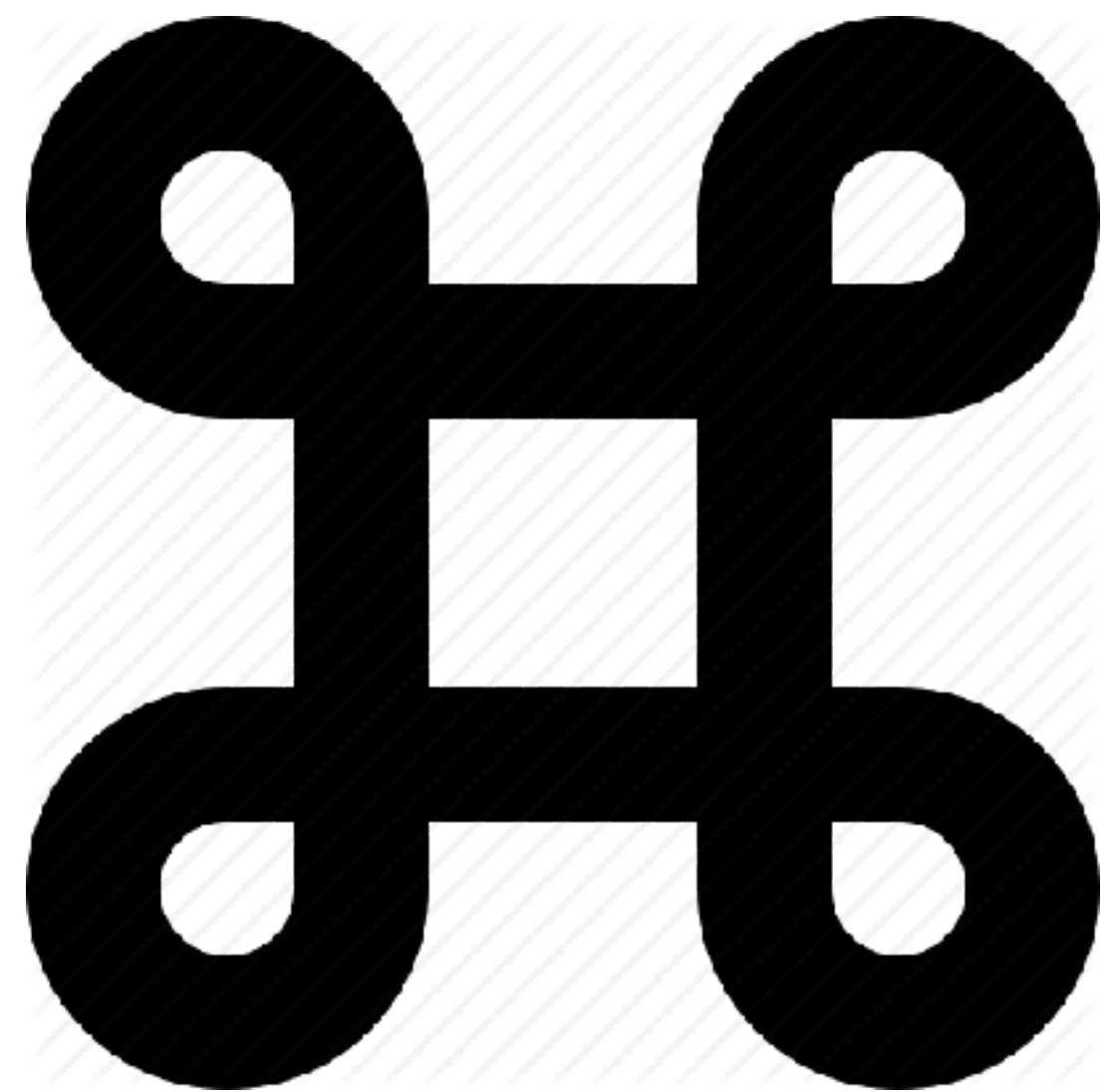
Credit

Event Store



Direction of time

How to deal with **shared** code?



-

C

P

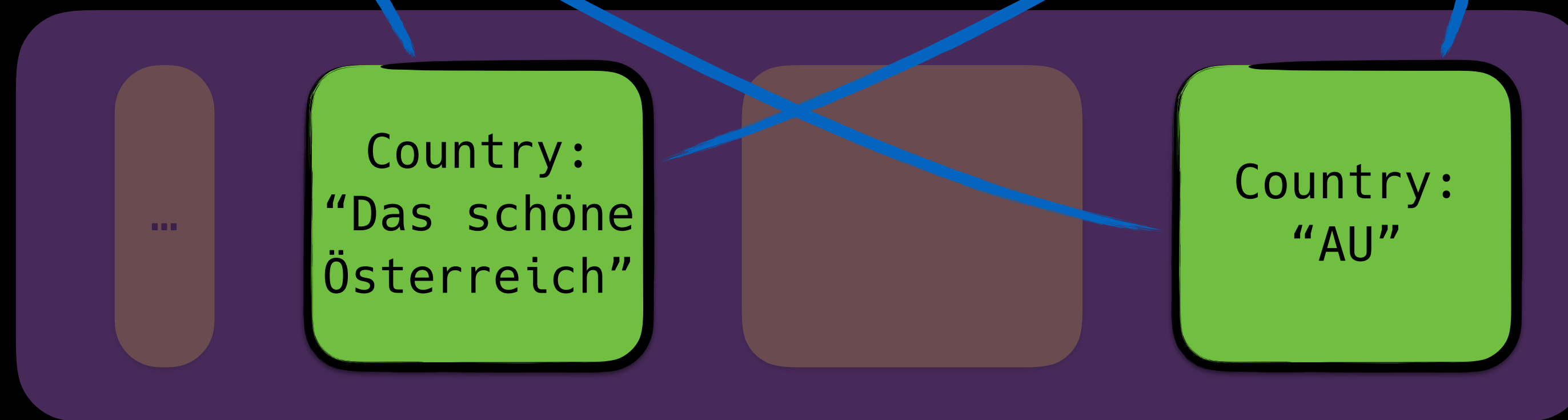
Customer

```
unless ISO.is_country_code(cnt) do
  | ...
end
```

Credit

```
unless ISO.is_country_code(cnt) do
  | ...
end
```

Event Store



Direction of time

2 months later...

Customer

```
unless ISO.  
  | ...  
end
```

Credit

```
unless ISO.  
  | ...  
end
```

Reporting

```
unless ISO.  
  | ...  
end
```

Accounting

```
unless ISO.  
  | ...  
end
```

Profile

```
unless ISO.  
  | ...  
end
```

Loan

```
unless ISO.  
  | ...  
end
```

Trading

```
unless ISO.  
  | ...  
end
```

Exchange

```
unless ISO.  
  | ...  
end
```

Broker

```
unless ISO.  
  | ...  
end
```

Purchase

```
unless ISO.  
  | ...  
end
```

Don't come up with a data cleansing **strategy**

WET is the new **DRY**

Never question the **design**

All systems should be **eventsourced**

Eventual consistency = “Eventuell konsistent”

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The home grown monolith



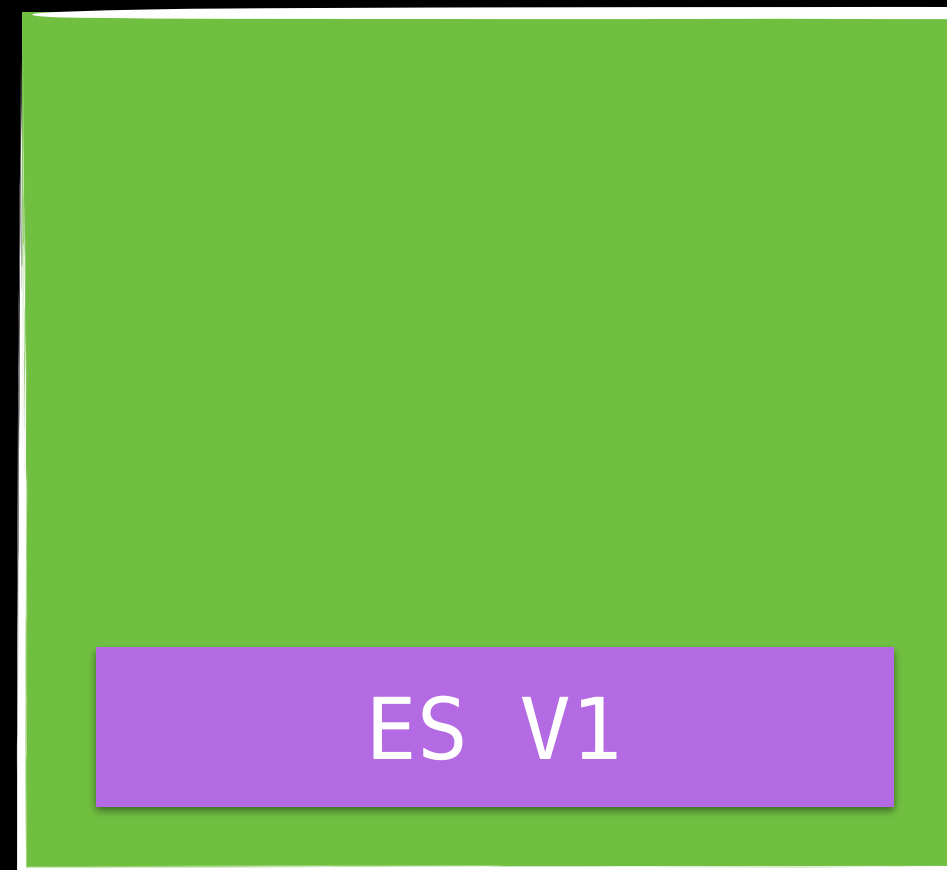
“If you wish to make **MICROSERVICES** from scratch, you must first create a **FRAMEWORK**”

– Carl Sagan (slightly paraphrased)

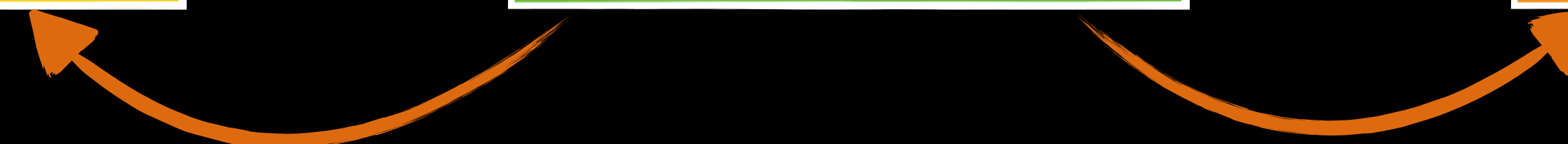
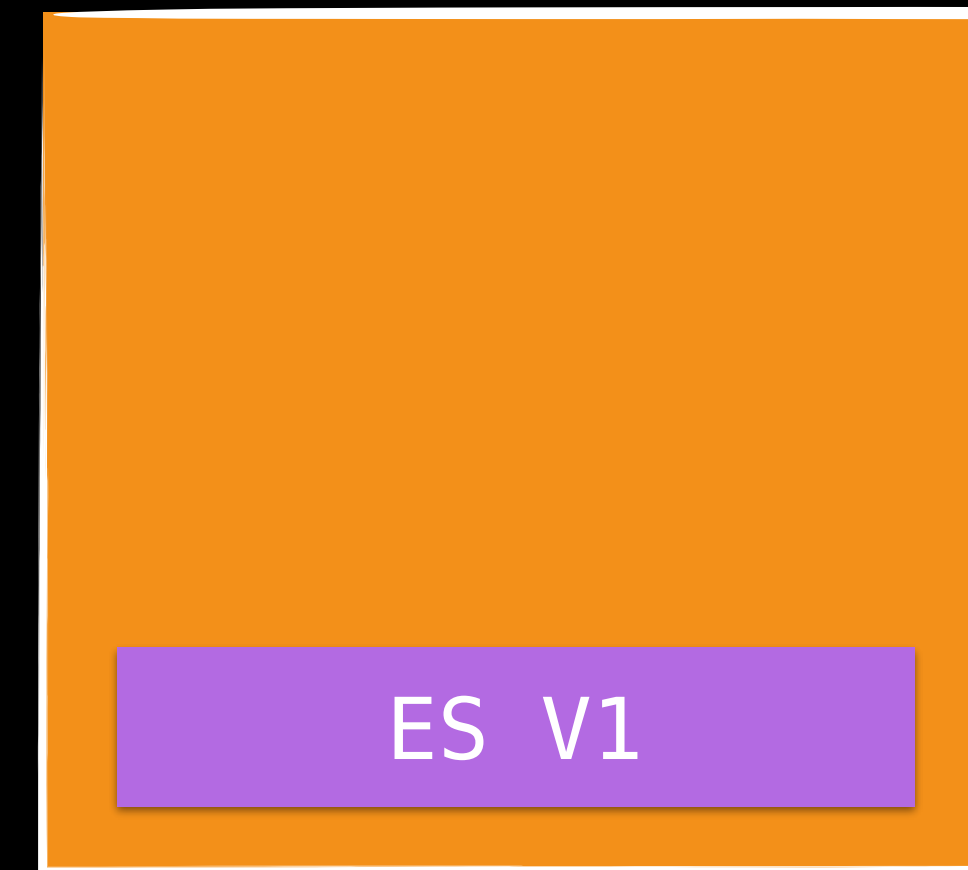
Account



Customer



Reporting



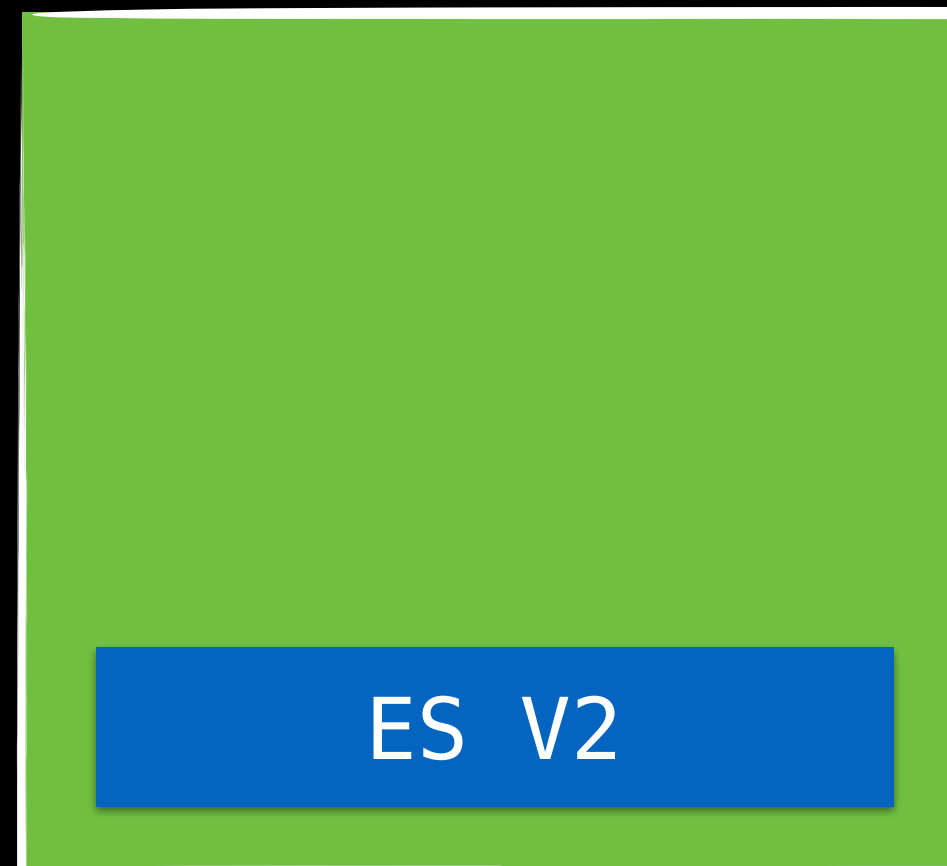
```
{  
  "type": "NewCustomerCreated",  
  "id": 1234,  
  "payload": {  
  }  
}
```

The customer system needs
special, non-numeric ids



Major.Minor.Bugfix

Customer V2



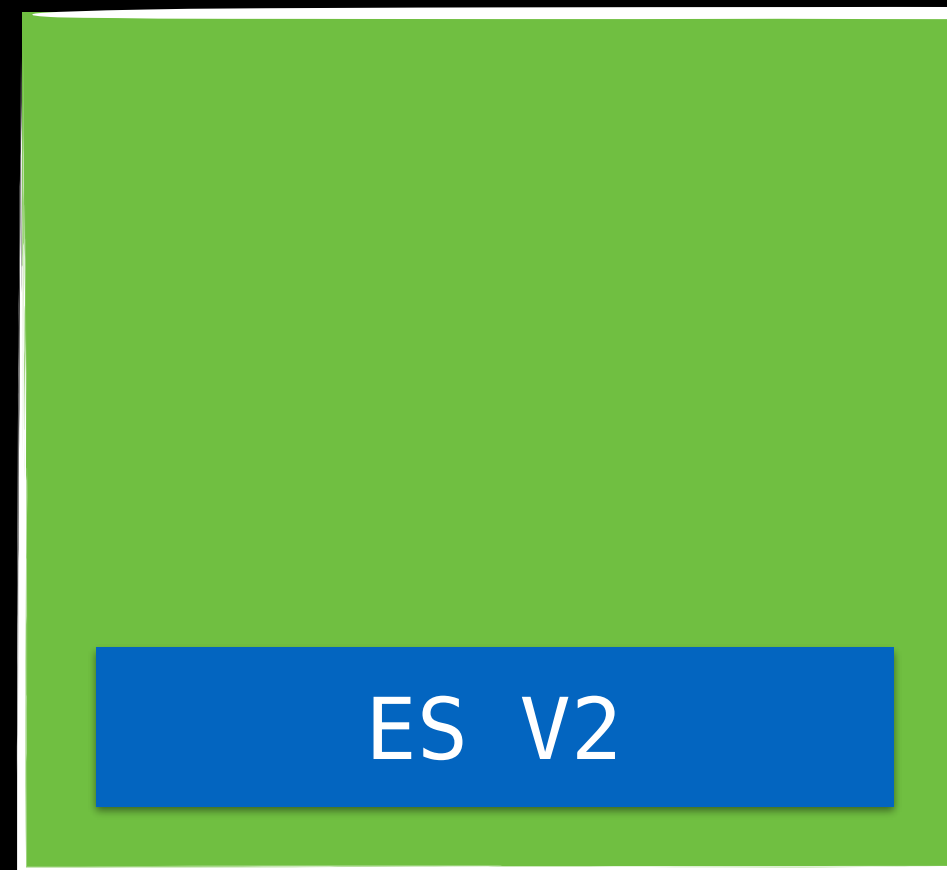
```
{  
  "type": "NewCustomerCreated",  
  "id": "1234-5678",  
  "payload": {  
    ...  
  }  
}
```

And at runtime???

Account



Customer V2



Reporting



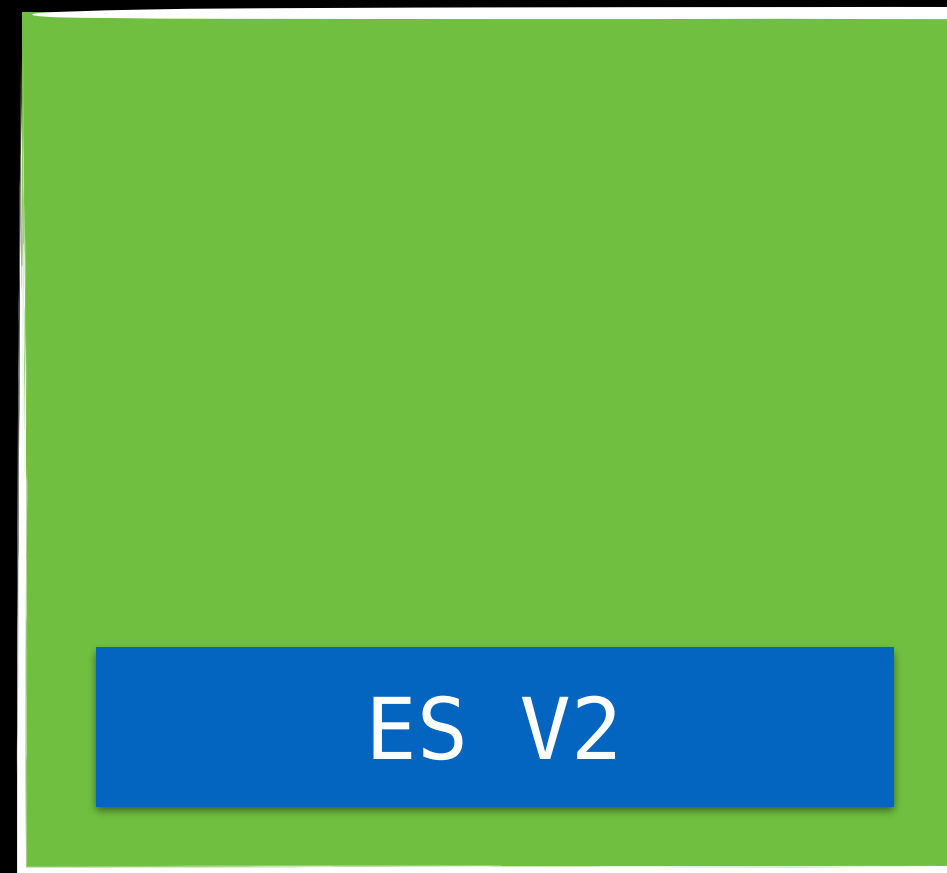
```
{  
  "type": "NewCustomerCreated",  
  "id": "1234-5678",  
  "payload": {  
    ...  
  }  
}
```

Change the world event

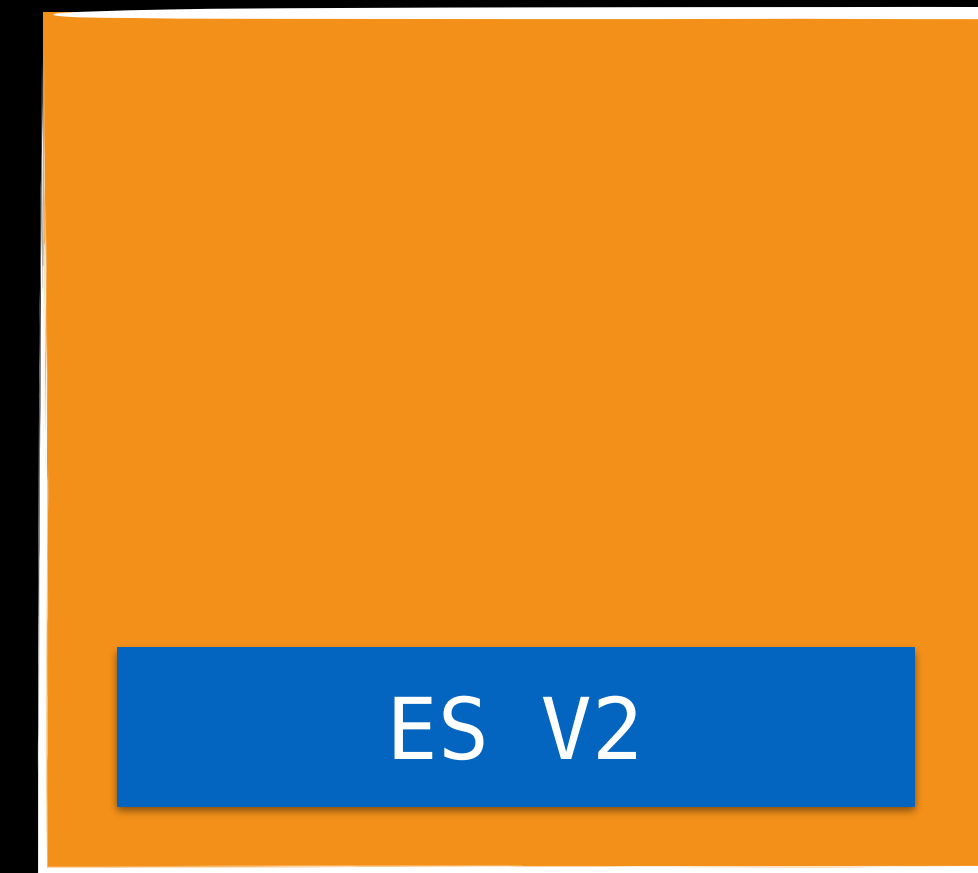
Account V2



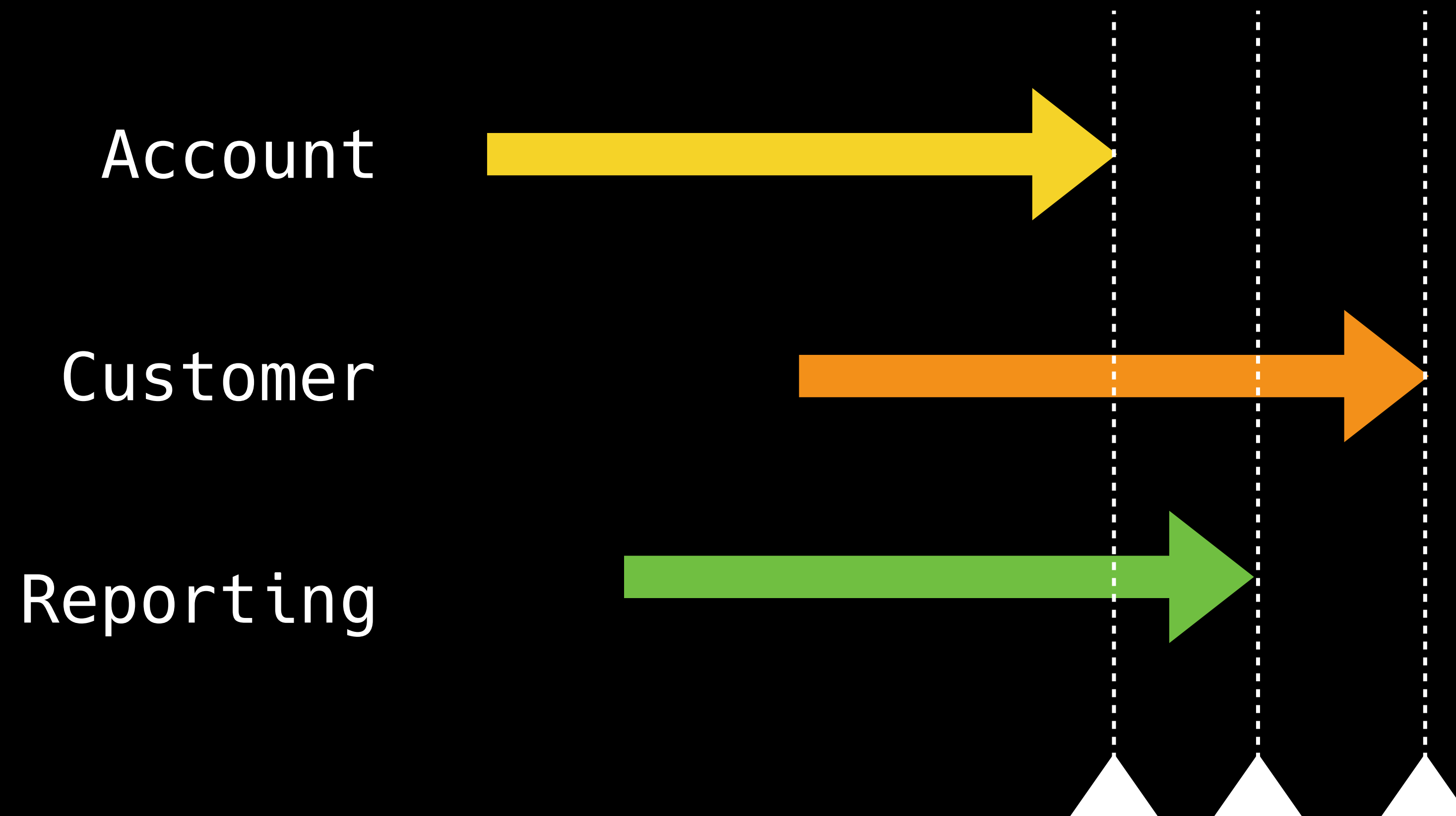
Customer V2



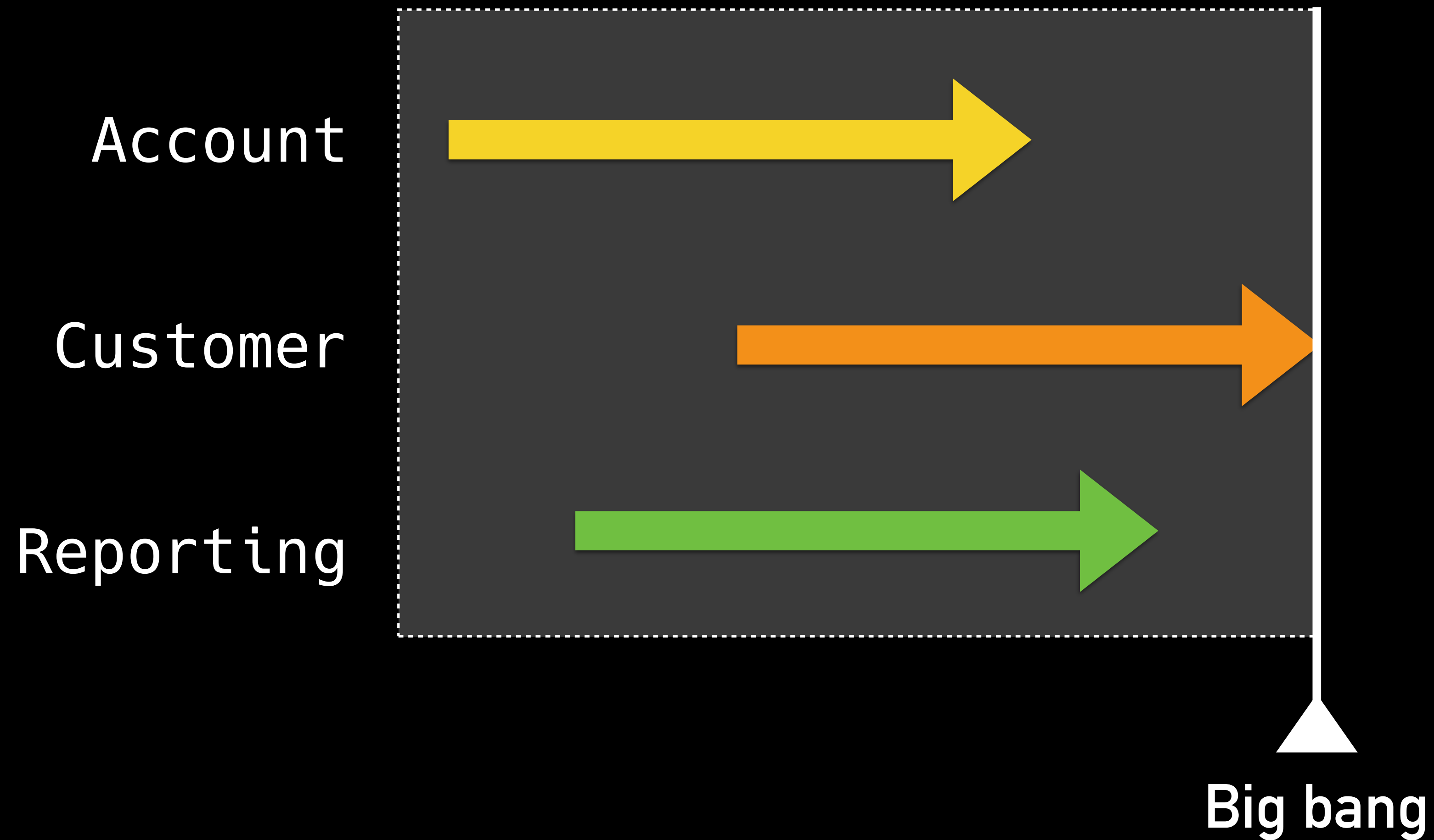
Reporting V2



Danger: **independent** releases



Success: release **monolith**



A close-up photograph of a silver metal briefcase filled with stacks of US \$100 bills. The bills are bundled with rubber bands. The briefcase is open, and several \$100 bills are scattered on the surface around it. The lighting is dramatic, highlighting the texture of the paper and the metallic sheen of the briefcase.

Day rates!

Dependencies as social tools

Job insurance via *invasive* frameworks

Building frameworks is fun!

**Ideas: collections, string-utils, logging,
ORM, JavaScript frontend framework!**

No time to create a framework?

10/Oct/1999:21:15:05 +0500

Sep 19 16:27:49

2007-08-31 19:22:21.469 ADT

060516 22:38:54

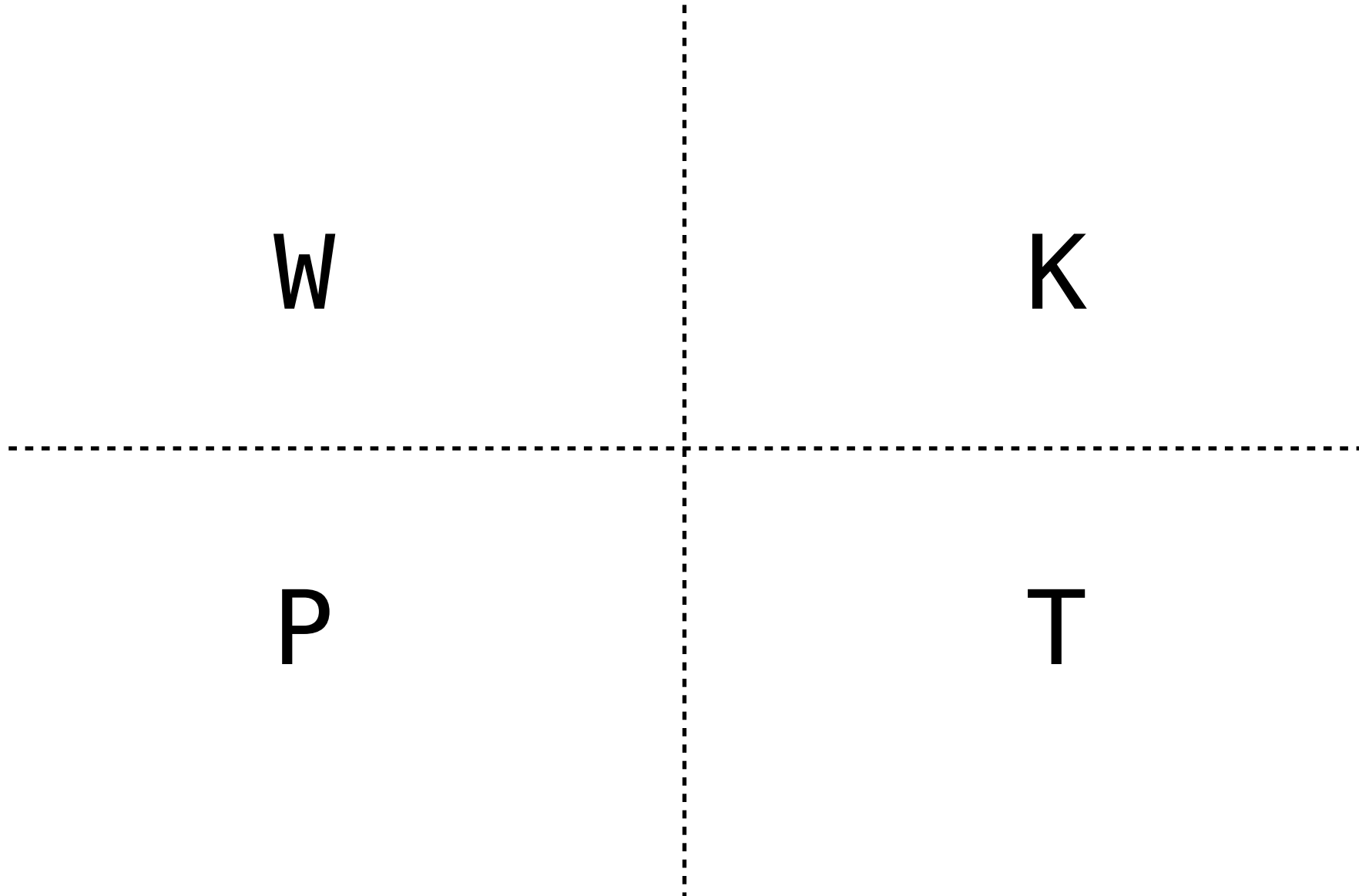
Fri Sep 09 10:42:29.902022 2011

6



The meat cloud

Bonus hint:
optimise your revenue!



Who **WANTS** it
to be done?

Who **KNOWS** how
to do it?

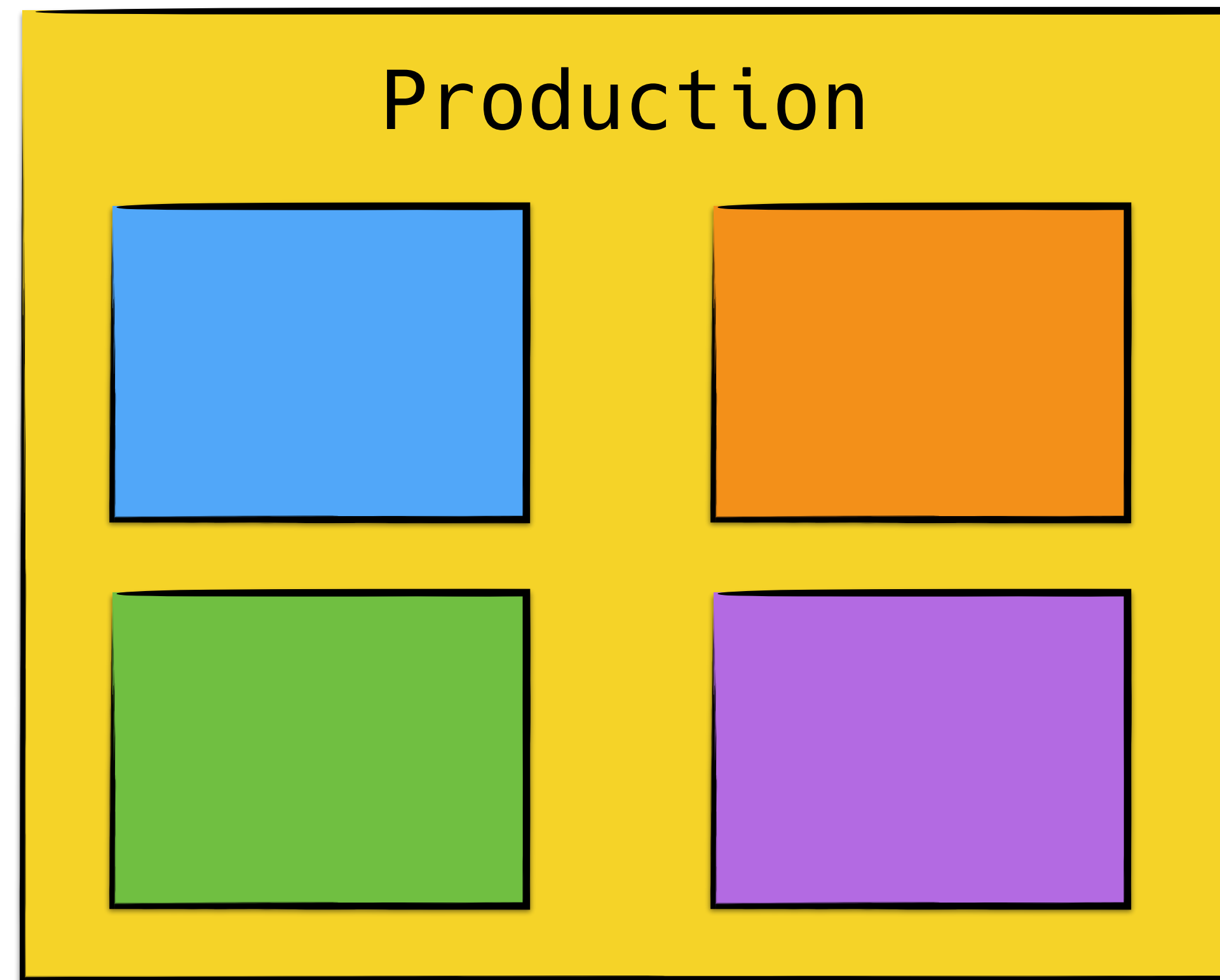
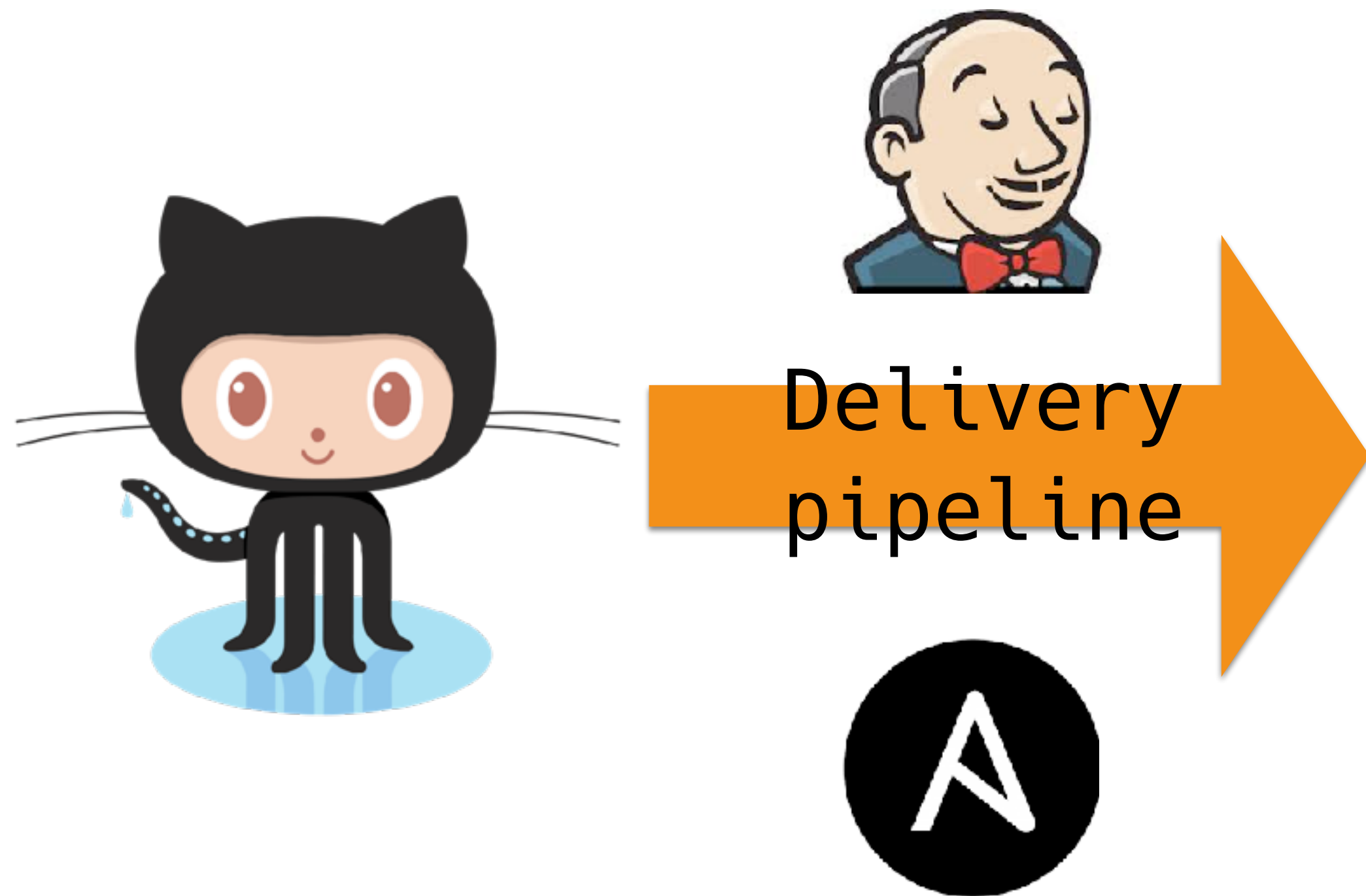
Who has the
required
PRIVILEGES?

Who has **TIME**
to actually
do it?

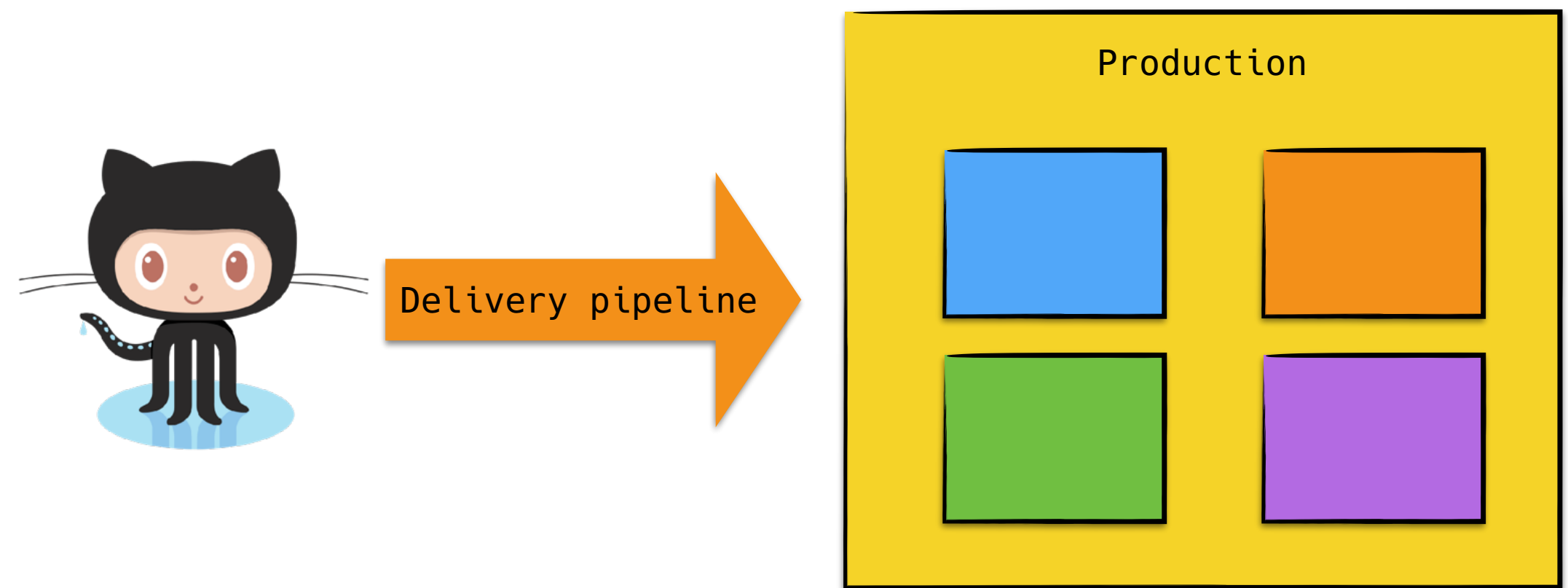
A high-angle, close-up photograph of a silver metal briefcase. The briefcase is open, and its interior is packed with numerous stacks of US \$100 bills. Each stack is secured with a yellow rubber band. The bills are slightly fanned out, showing the portrait of Benjamin Franklin. Some bills are scattered on the surface around the briefcase, creating a sense of abundance. The lighting is dramatic, highlighting the texture of the paper and the metallic sheen of the briefcase. The overall composition is centered around the text 'Day rates!', which is overlaid in a large, white, sans-serif font.

Day rates!

Clever insight:
CD is very useful



And the **rest** of the
world?



Soulless
automation



Handcrafted
with love

Cattle not pets

Ask yourself:
Whom do **YOU** love more?

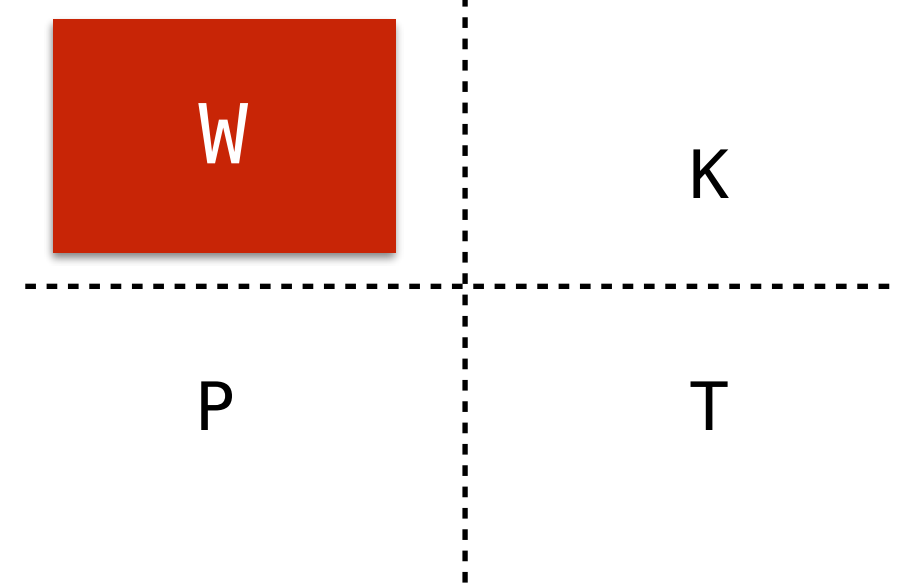


Mr. Wiskers

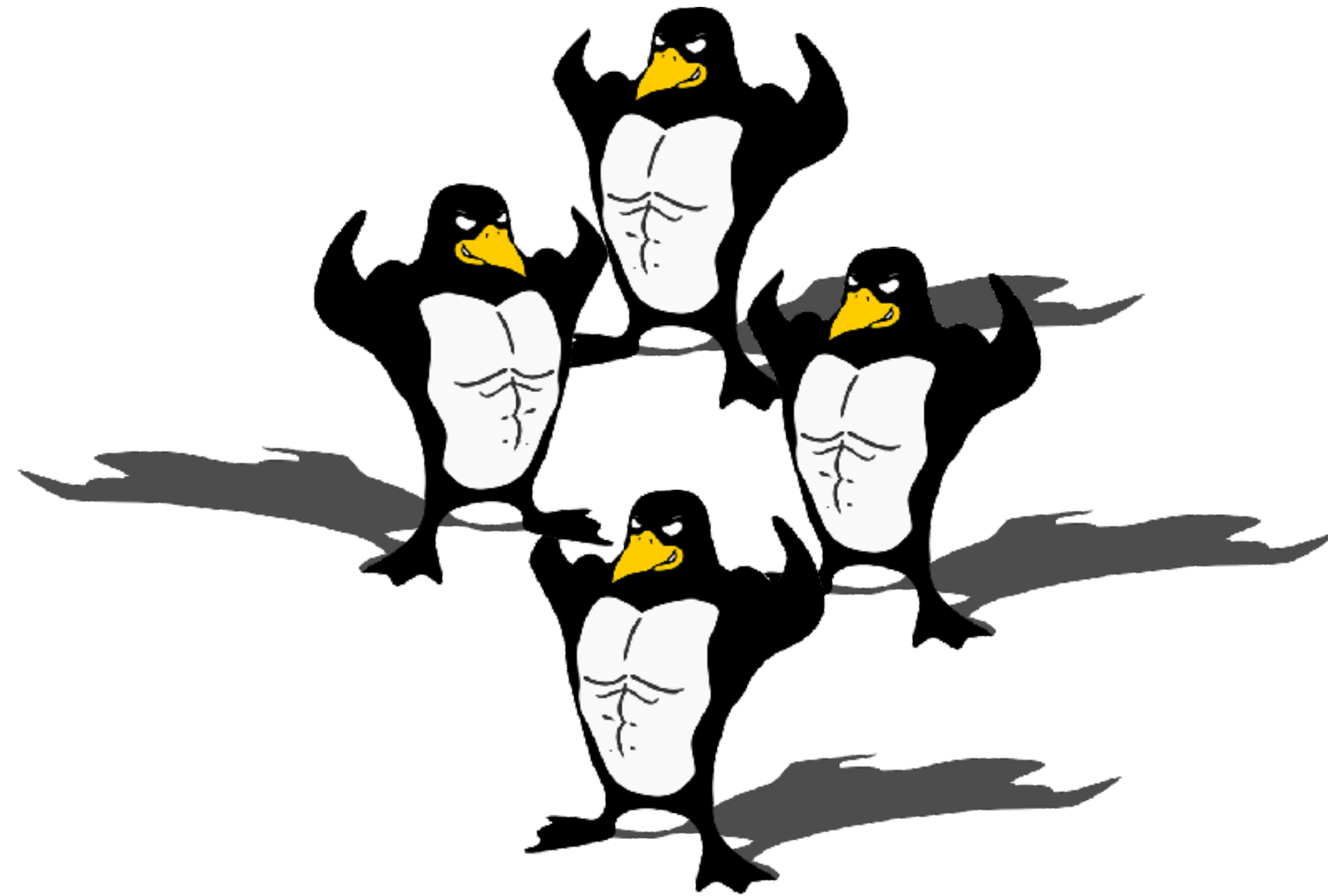


Walking steak

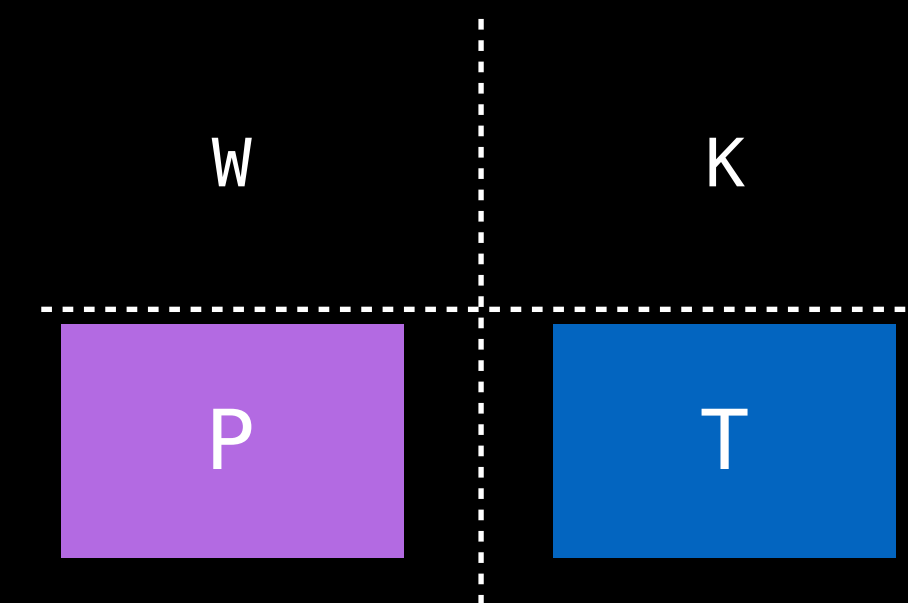
Quickly...release a **new**
Customer microservice



Enter the DevOps Team™



Ops toolchain?



Environment

Prod



For example operating system, software platform and/or hardware specifications (include as app issue).

Description

Hey Ops Guys,

please release a new version of ms-customer.jar.

BTW. The route must be /customer.

And do not forget the logging config, for lolz!

CU



W

K

P

T

```
111
112 location /account/ {
113
114 }
115
116 location /credit/ {
117
118 }
119
120 location /custmoer/ {
121
122 }
"/etc/nginx/default.conf" [Modified][Not edited] 156 lines --60%--
```

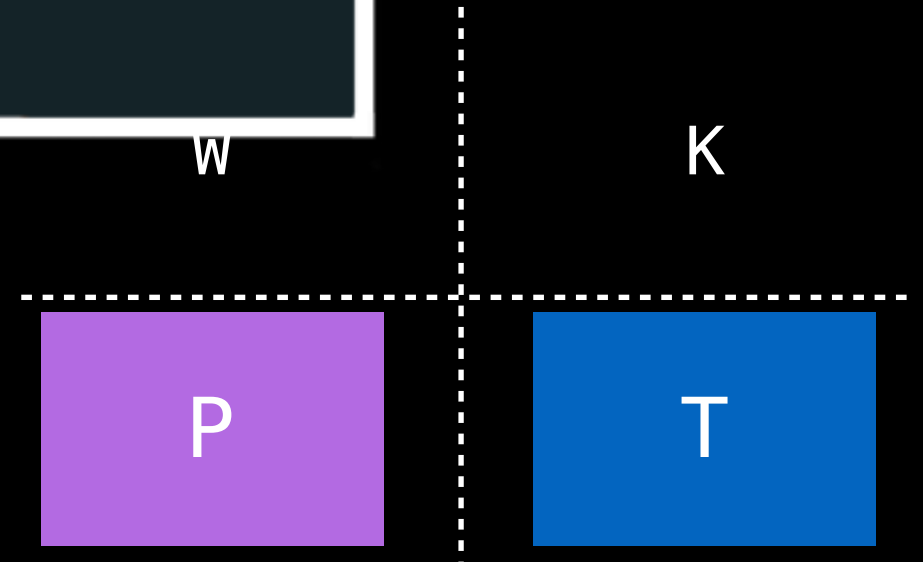
W

K

P

T

```
118 }  
119  
120 location /custmoer/ {  
121  
122 }
```





Infrastructure is expensive...be **proud** to
take care of it

Microsoft Word is **some kind of automation**

Play the “**we are not Google**” card

Combine with **polyglot ops** for **maximum
chaos**

5

**ALPHA PATTERN
NEEDS FURTHER PROOF**

The prescriptive cloud

Agility

Flexibility

Scale as you grow

Use what you need

The

O S F A

Cloud

The

One Size Fits All

Cloud

Rails
TODO app

200 users now...

...but we might become the next Google

Docker

Rails
TODO app

Node

Service

Etcd

Pod

Docker

Rails
TODO app

Pod

Docker

Rails
TODO app

FEK

Volume

VPC

Cloudwatch

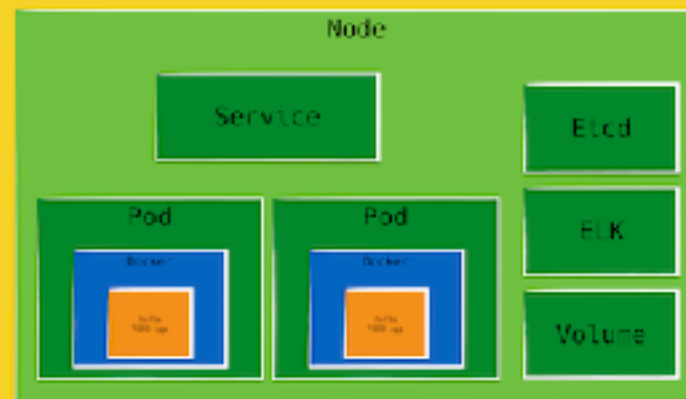
Security group

EBS

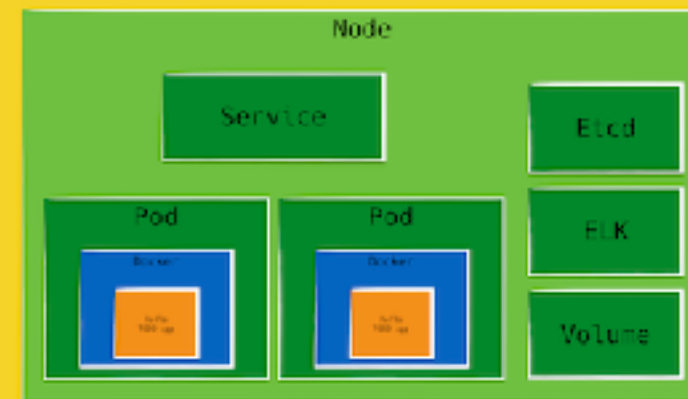
ELB

IAM

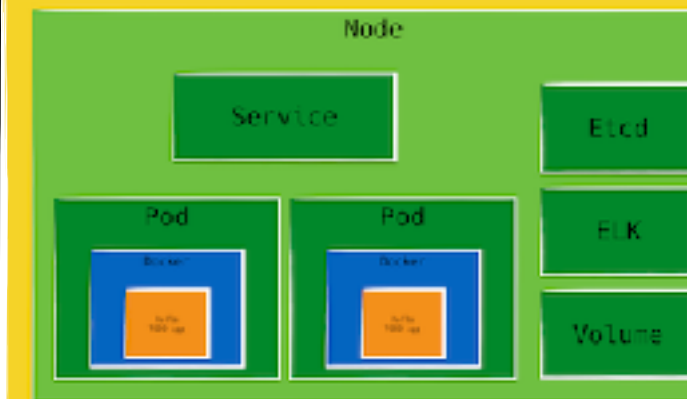
EC2



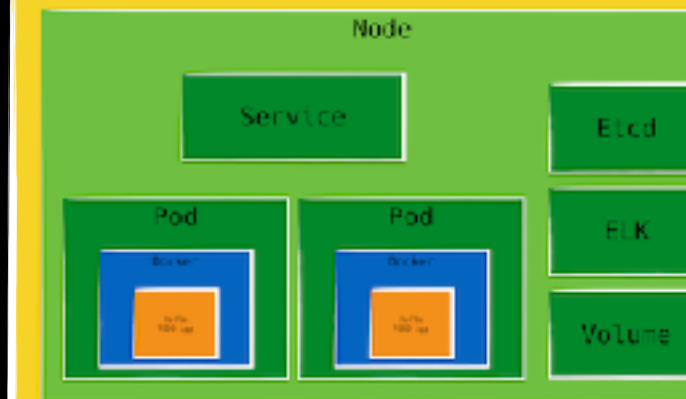
EC2



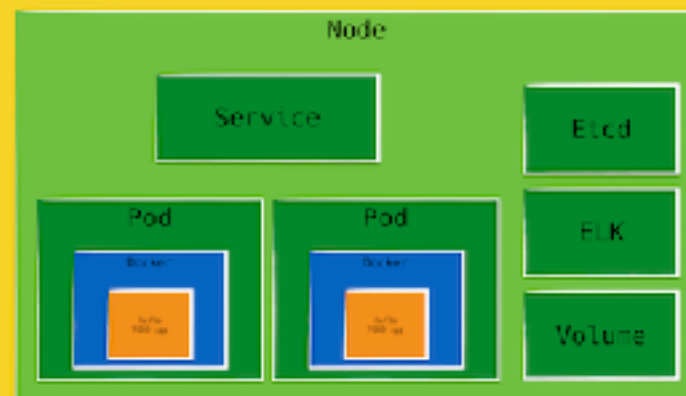
EC2



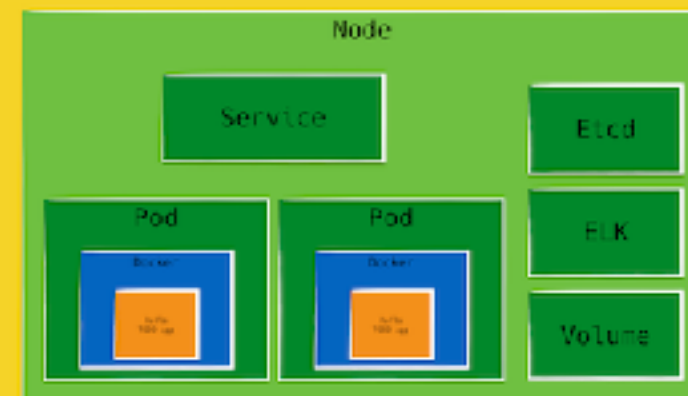
EC2



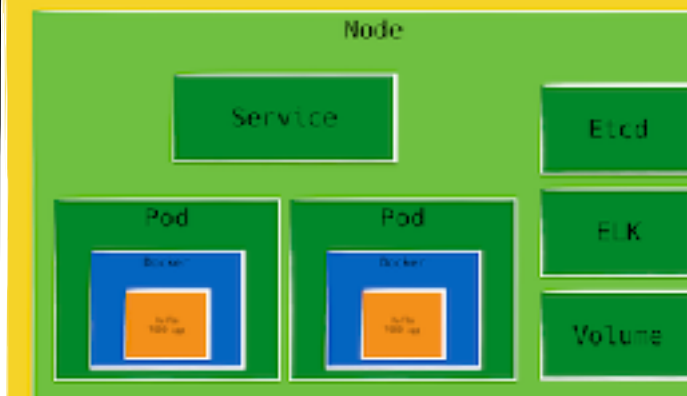
EC2



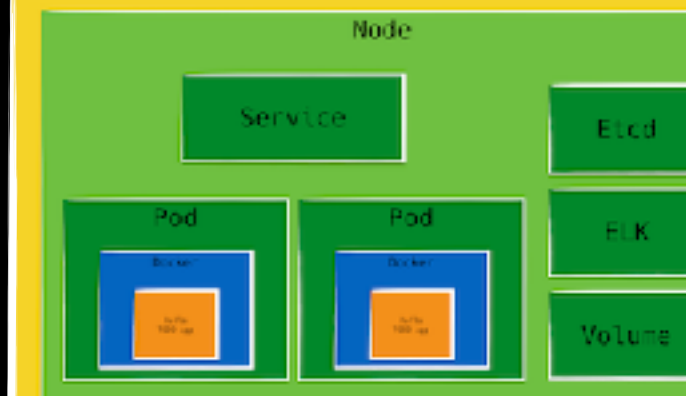
EC2



EC2



EC2



```
[610420.800771] kube-state-metr invoked oom-killer: gfp_mask=0x24000c0, order=0, oom_score_adj=-998
[610420.805428] kube-state-metr cpuset=32c394ad4709430cddb71194ea406d598b82159c2715d42b64927ac5e67f0228 mems_allowed=0
[610420.810504] CPU: 3 PID: 9403 Comm: kube-state-metr Tainted: G          E   4.4.65-k8s #1
[610420.813712] Hardware name: Xen HVM domU, BIOS 4.2.amazon 11/11/2016
[610420.813712] 0000000000000286 00000000c5185d6f ffffffff812f67b5 ffff8803e7163e20
[610420.813712] ffff8803e71c8400 ffffffff811d8855 ffffffff81826173 ffff8803e71c8400
[610420.813712] ffffffff81a6b740 0000000000000206 0000000000000002 ffff880308bbf438
[610420.813712] Call Trace:
[610420.813712] [<ffffffff812f67b5>] ? dump_stack+0x5c/0x77
[610420.813712] [<ffffffff811d8855>] ? dump_header+0x62/0x1d7
[610420.813712] [<ffffffff8116ded1>] ? oom_kill_process+0x211/0x3d0
[610420.813712] [<ffffffff811d0f4f>] ? mem_cgroup_iter+0x1cf/0x360
[610420.813712] [<ffffffff811d2de3>] ? mem_cgroup_out_of_memory+0x283/0x2c0
[610420.813712] [<ffffffff811d3abd>] ? mem_cgroup_oom_synchronize+0x32d/0x340
[610420.813712] [<ffffffff811cf170>] ? mem_cgroup_begin_page_stat+0x90/0x90
[610420.813712] [<ffffffff8116e5b4>] ? pagefault_out_of_memory+0x44/0xc0
[610420.813712] [<ffffffff815a65b8>] ? page_fault+0x28/0x30
[610426.700118] Task in /kubepods/pod401c0ec6-97d9-11e7-adb9-021e5eba15b7/32c394ad4709430cddb71194ea406d598b82159
[610426.711591] memory: usage 16384kB, limit 16384kB, failcnt 629216
[610426.715097] memory+swap: usage 0kB, limit 9007199254740988kB, failcnt 0
[610426.719063] kmem: usage 0kB, limit 9007199254740988kB, failcnt 0
[610426.722823] Memory cgroup stats for /kubepods/pod401c0ec6-97d9-11e7-adb9-021e5eba15b7: cache:0KB rss:0KB rss_huge:0KB
[610426.749544] Memory cgroup stats for /kubepods/pod401c0ec6-97d9-11e7-adb9-021e5eba15b7/32c394ad4709430cddb71194ea406d598b82159c2715d42b64927ac5e67f0228:
[610426.765166] [ pid ]   uid  tgid total_vm      rss nr_ptes nr_pmds swapents oom_score_adj name
[610426.769304] [ 7288]    0  7288    257        1     4      2        0          -998 pause
[610426.773553] [20340]    0 20340   11395    7113     27      5        0          -998 kube-state-metr
[610426.778753] Memory cgroup out of memory: Kill process 20340 (kube-state-metr) score 769 or sacrifice child
...
...
```

Approx. 3 billion lines of garbage logs
to analyse for fun

Not enough?

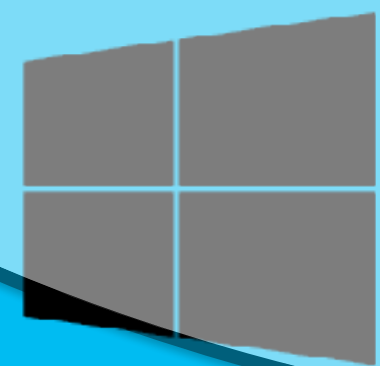
Multi-Cloud



Google Actual Cloud Platform



amazon
web services™



Azure

Poly  works for ops

PERIODIC TABLE OF DEVOPS TOOLS (V2)

Os Open Source	SCM	Database Mgmt	Build
Fr Free	CI	Repo Mgmt	Testing
Fm Freemium	Deployment	Config / Provisioning	Containerization
Pd Paid	Cloud / IaaS / PaaS	Release Mgmt	Collaboration
En Enterprise	BI / Monitoring	Logging	Security

1 Fm Gh Github																2 Fm Aws AmazonWeb Services					
3 Os Gt Git	4 En Dm DBmaestro															5 En Ch Chef	6 En Pu Puppet	7 Os An Ansible	8 Os Sl Salt	9 Os Dk Docker	10 Pd Az Azure
11 Fm Bb Bitbucket	12 Os Lb Liquibase															13 Os Ot Otto	14 En Bl BladeLogic	15 Os Va Vagrant	16 Fr Tf Terraform	17 Os Rk rkt	18 En Gc Google Cloud Platform
19 Os Gl GitLab	20 En Rg Redgate	21 Os Mv Maven	22 Os Gr Gradle	23 Os At ANT	24 Os Fn FitNesse	25 Fr Se Selenium	26 Os Ga Gatling	27 Fr Dh Docker Hub	28 Os Jn Jenkins	29 Pd Ba Bamboo	30 Os Tr Travis CI	31 Pd Gd Deployment Manager	32 Os Sf SmartFrog	33 Os Cn Consul	34 Os Bc Bcfg2	35 Os Mo Mesos	36 En Rs Rackspace				
37 Os Sv Subversion	38 En Dt Datical	39 Os Gt Grunt	40 Os Gp Gulp	41 Os Br Broccoli	42 Fr Cu Cucumber	43 Os Cj Cucumber.js	44 Fr Qu Qunit	45 Os Npm npm	46 Fm Cs Codeship	47 Pd Vs Visual Studio	48 Fm Cr CircleCI	49 Fr Cp Capistrano	50 Fr Ju JuJu	51 Os Rd Rundeck	52 Os Cf CFEngine	53 Fr Ds Swarm	54 Os Op OpenStack				
55 Os Hg Mercurial	56 En Dp Delphix	57 Fr Sb sbt	58 Os Mk Make	59 Os Ck CMake	60 Fr Jt JUnit	61 Fr Jm JMeter	62 Fr Tn TestNG	63 Os Ay Artifactory	64 Fm Tc TeamCity	65 Fm Sh Shippable	66 Os Cc CruiseControl	67 En Ry RapidDeploy	68 Fm Cy CodeDeploy	69 En Oc Octopus Deploy	70 En No CA Nolio	71 Os Kb Kubernetes	72 Fm Hr Heroku				
73 En Cw ISPW	74 En Id Idera	75 Os Msb MSBuild	76 Os Rk Rake	77 Fr Pk Packer	78 Os Mc Mocha	79 Fr Km Karma	80 Os Jm Jasmine	81 Os Nx Nexus	82 Os Co Continuum	83 Fm Ca Continua CI	84 Pd So Solano CI	85 En Xld XL Deploy	86 En Eb ElasticBox	87 Fm Dp Deploybot	88 En Ud UrbanCode Deploy	89 Os Nm Nomad	90 En Os OpenShift				

XebiaLabs

[Follow @xebialabs](#)

91 En Xlr XL Release	92 En Ur UrbanCode Release	93 En Bm BMC Release Process	94 En Hp HP Codar	95 En Au Automic	96 En Pl Plutora Release	97 En Sr Serena Release	98 Pd Tfs Team Foundation	99 Fm Tr Trello	100 Pd Jr Jira	101 Fm Rf HipChat	102 Fm Sl Slack	103 Fm Fd Flowdock	104 Pd Pv Pivotal Tracker	105 En Sn ServiceNow
106 Os Ki Kibana	107 Fm Nr New Relic	108 En Dt Dynatrace	109 Os Ni Nagios	110 Os Zb Zabbix	111 En Dd Datadog	112 Os EI Elasticsearch	113 Fm Ad AppDynamics	114 En Sp Splunk	115 Fm Le Logentries	116 Fm Sl Sumo Logic	117 Os Ls Logstash	118 Os Sn Snort	119 Os Tr Tripwire	120 En Ff Fortify

Still successful?
Process to the rescue

Checklists (**Excel** or **PPT!**)

Arbitrary naming conventions

External (but **unknown**)

stakeholders

Last minute **documents**

(Templates, Fonts!)

**Be proud of complexity, we are
engineers for a reason**

**Ops tooling puts JavaScript to
shame**

If Twitter runs on it, so should you

Combine with Meat cloud

4



The SPA monolith

Sophisticated portal
frontend

```
graph TD; A[Sophisticated portal frontend] --> B[Customer REST]; A --> C[Account REST]; A --> D[Credit REST];
```

Customer REST

Account REST

Credit REST

Add a **mandatory**
social-number field to the
customer



But not that mandatory. E.g. if
the customer **is not committed**, yet



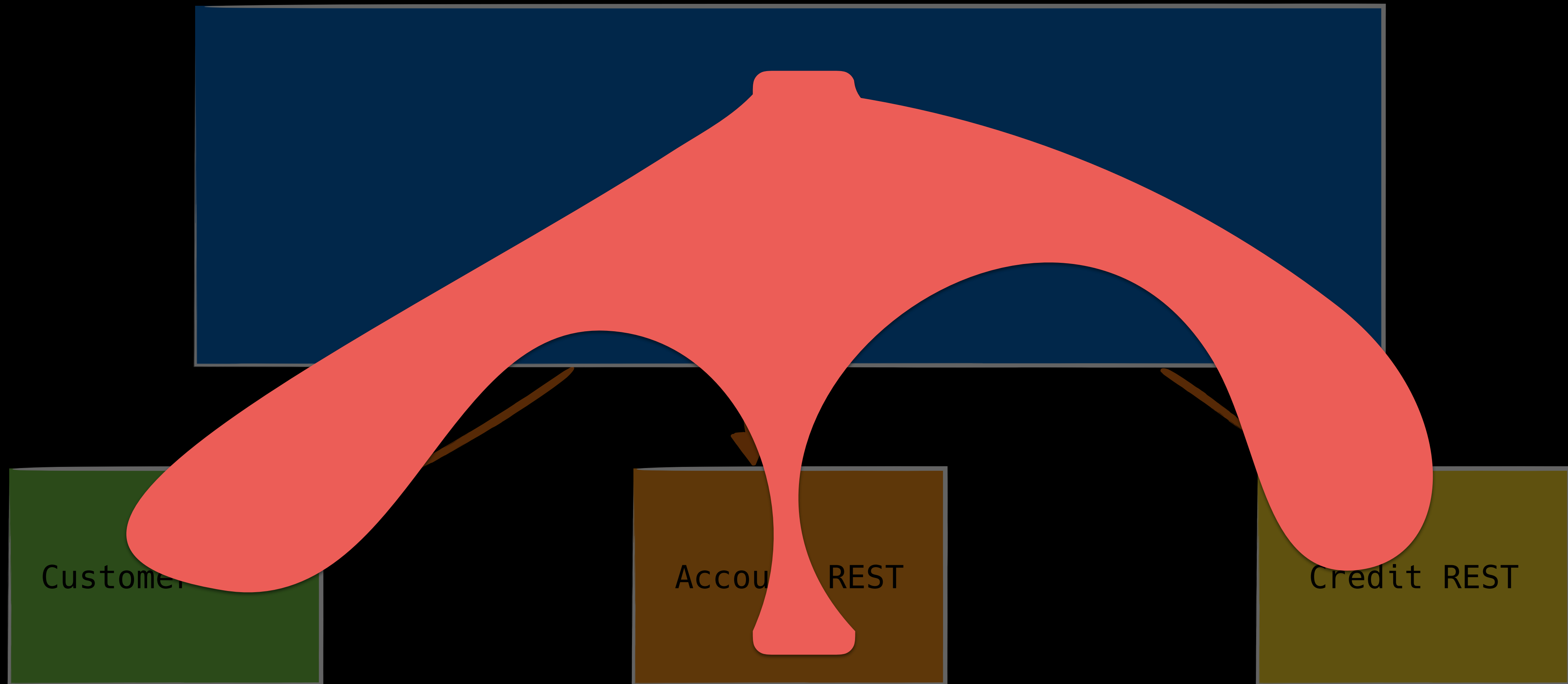
Comprehensive UI Domain Model

Customer Domain

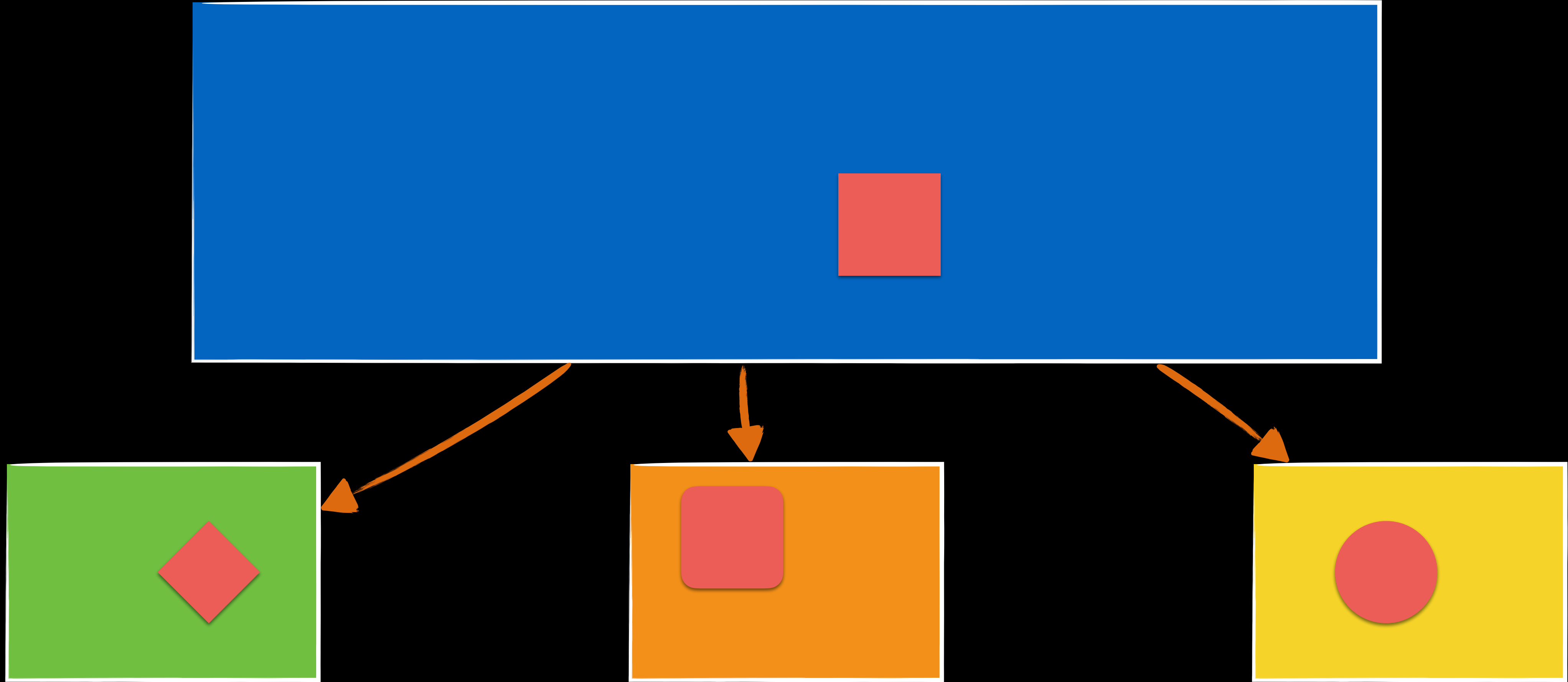
Account Domain

Credit Domain

Domain is spread around

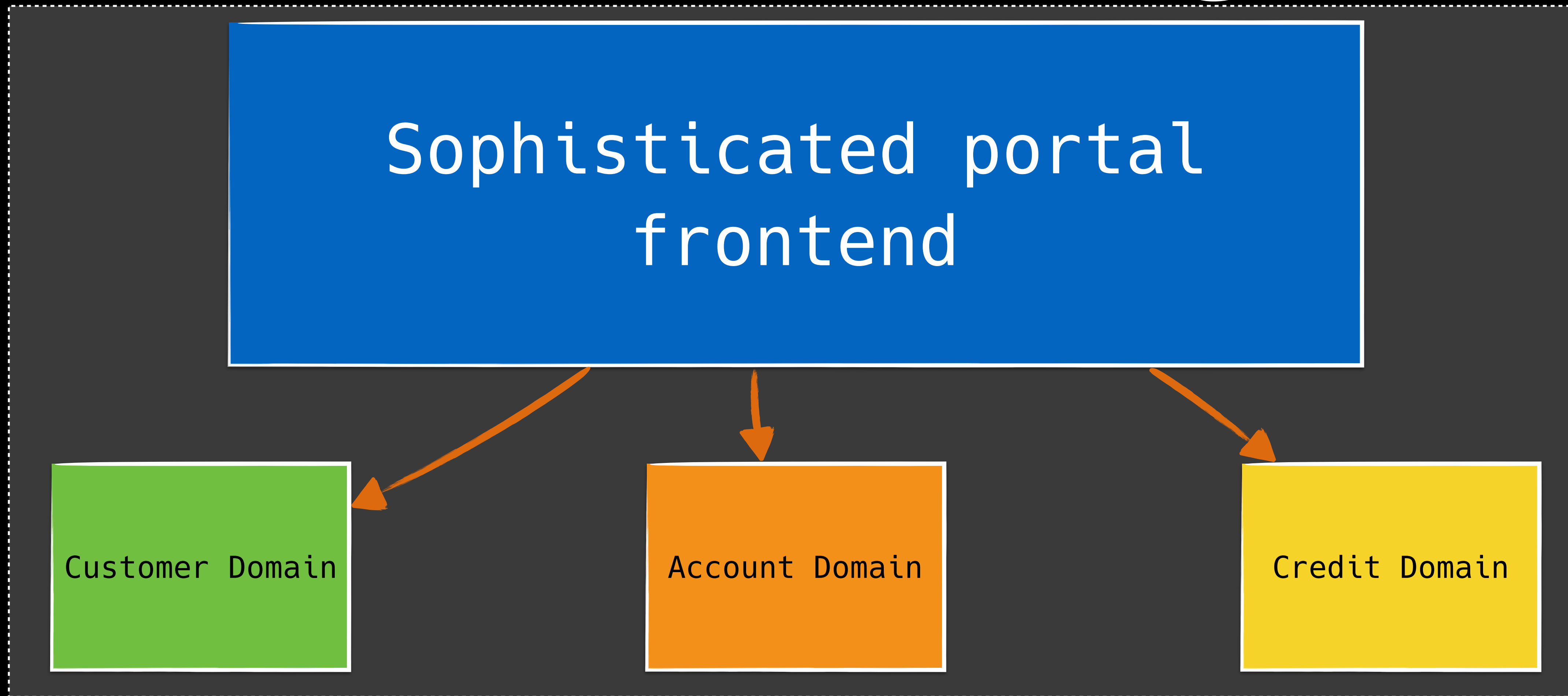


Where should the logic go?



Advantage?

UI-driven changes



Microservices are **REST only** (hint: service!)

Meet people while discussion ownership
and conflicting features

Keep the testers busy with **side effects**

Single point of failure - **blame the script**
kids working on the UI

3

The decision monolith

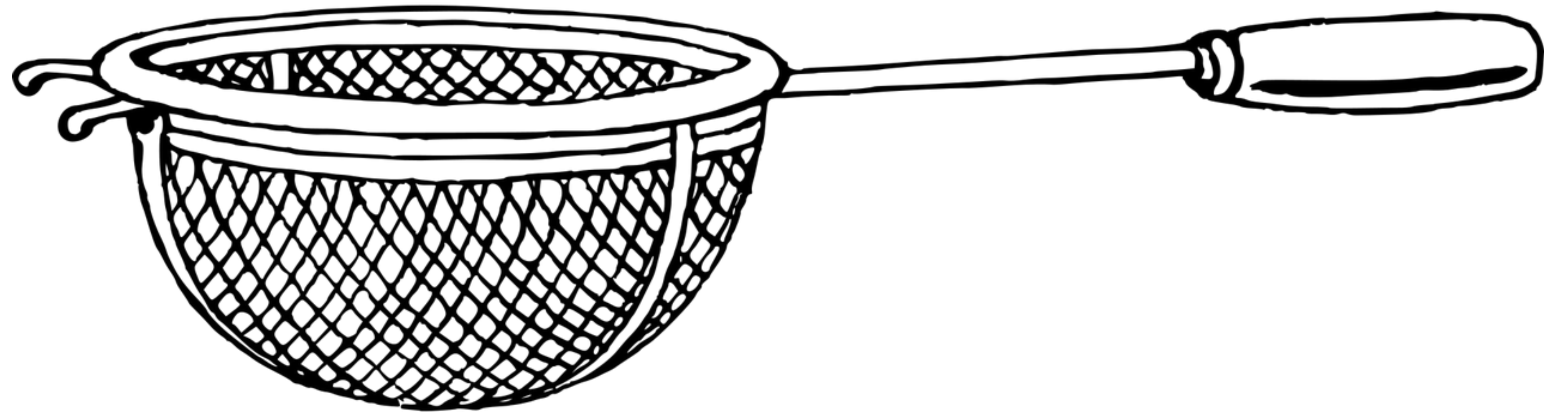
“But we need **Java 7**...it is **2017** after all!”

– Some Developer who does not understand ENTERPRISE IT!

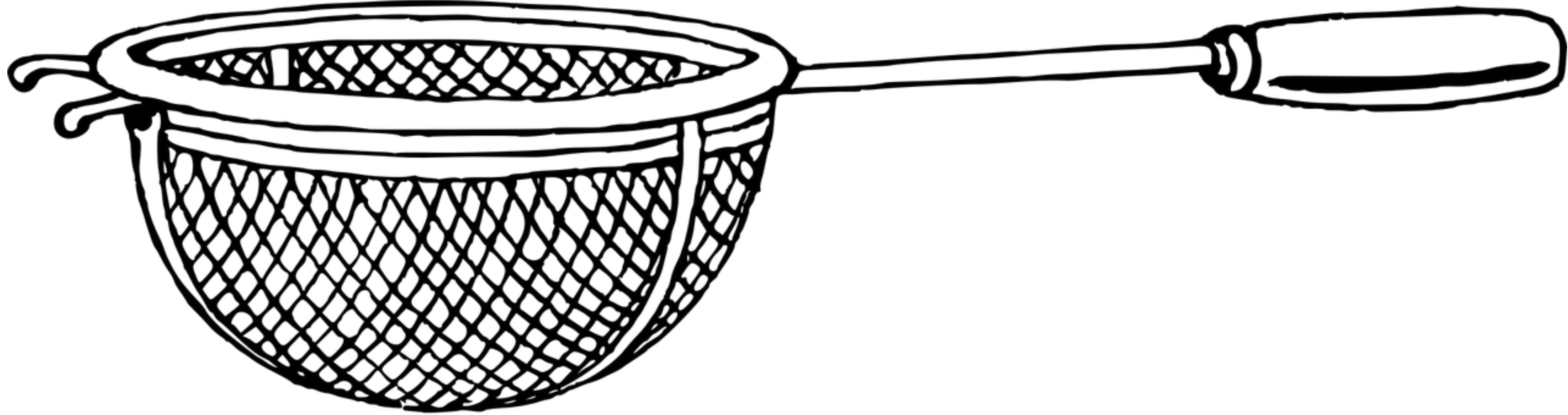
Developer madness

Blockchain Actors Cloud Augmented reality
WebRTC IoT Rx AWS
Agile Microservice

Architecture & Design
Sieve of Sanity



Blockchain Actors Cloud Augmented reality
WebRTC IoT Rx AWS
Agile Microservice



WebSphere
JEE

Frustrate your coworkers

Irritate **motivated** colleagues

Do not **play around** with technology

If you are older than 30...play the “**This is
real enterprise, kid**” card

Ivory towers are **beautiful**

2

The business
monolith



**Business people cannot understand
~~complex~~ any architecture**



Product Toolset Something



Let's force the user to
always enter a **valid address**

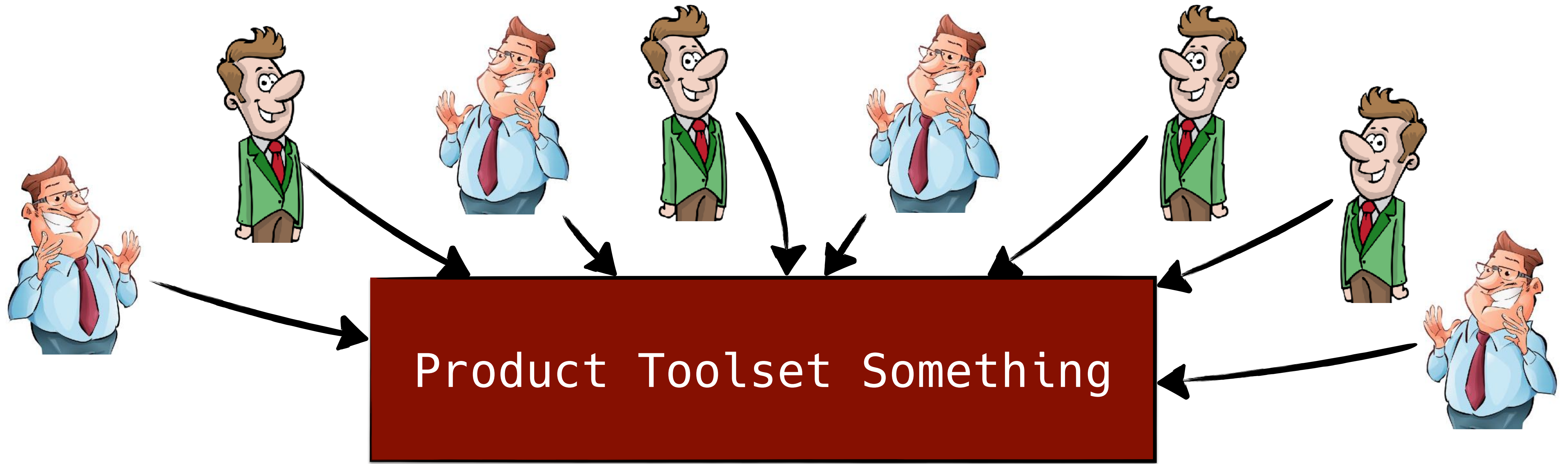


No, the customer
should be able to enter **partial**
addresses



Requirements Ping Pong

A close-up photograph of a red ping pong paddle and a white ping pong ball resting on a reflective table. The paddle is positioned horizontally, and the ball is placed in front of it. The background shows a blurred ping pong table net and brick walls. A semi-transparent dark grey banner is overlaid across the middle of the image, containing the text 'Requirements Ping Pong' in white.



??????

Credit

Account

Payment

Change management

Requirements management



Day rates!

Bonus:
works with ops, too

Product Toolset Something

What the....?



Water**scrum**fall



Business



Development



Ops

Avoid X-functional teams

Slow means more time for Twitter!

The servant of many kings is a free man

**Change / Requirement mgmt. are your
allies**

Conway's law works both ways

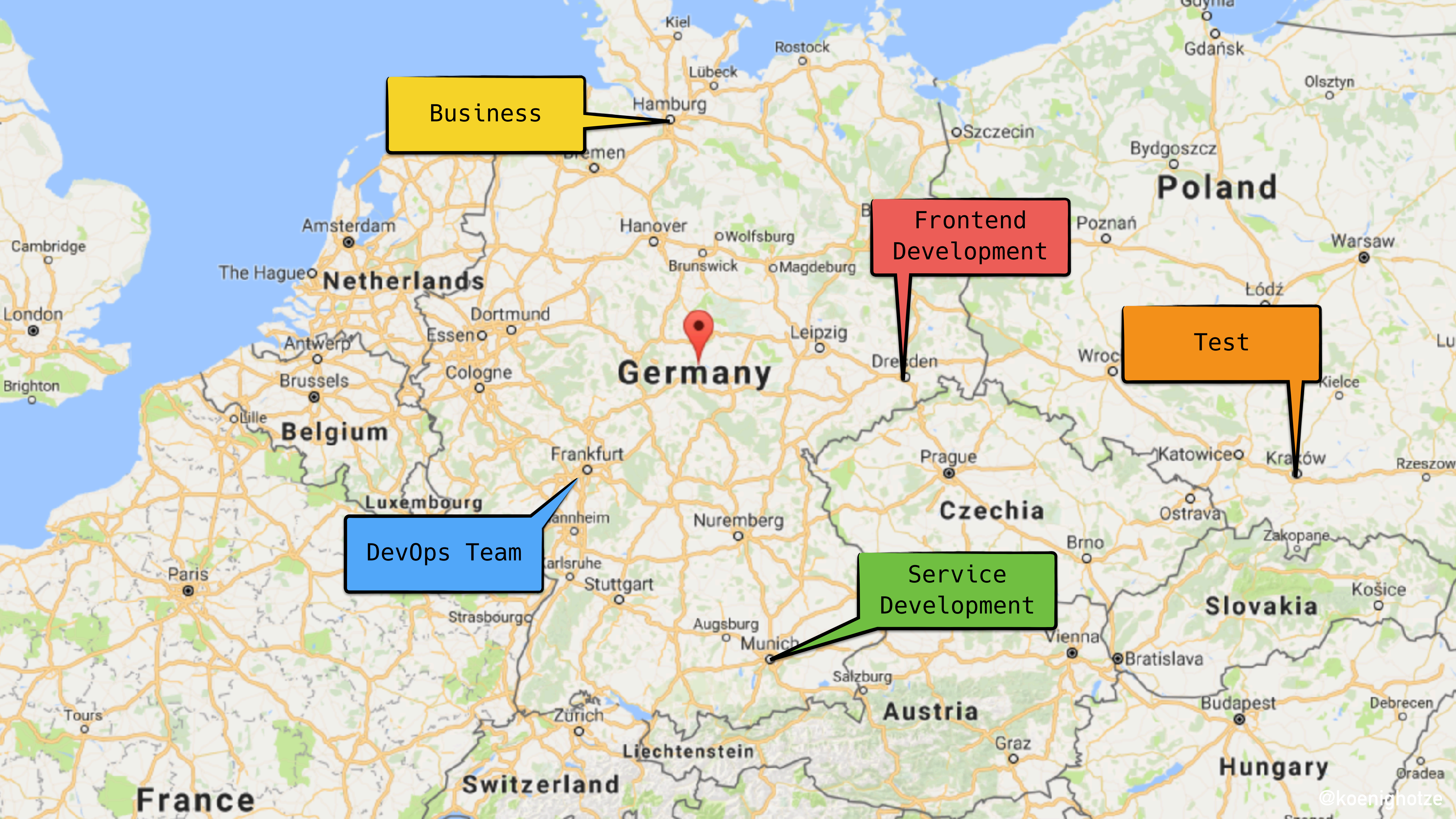
1



The staffing monolith

It is **easier** to search for React
developers than for general
craftswomen





Business

Frontend Development

Test

Service Development

DevOps Team

But...why?

Frequent Flyer Program
Rail-Bonus Program
Hotel Credit Points

Dysfunctional setup in 3 easy steps

Step 1

**Establish distributed
communication**

*Magic
Specification
Success
Template*



Step 2

Setup firewalls

Team A

Frontend Microservice



Service Microservice

Team B



Team C

Persistence Stuff

Step 3

Use bureaucracy

“Product
Owner”



The frontend team



“Product
Owner”



The service team



“Product
Owner”



The database guys



A close-up photograph of a silver metal briefcase filled with stacks of US \$100 bills. The bills are bundled with rubber bands. The briefcase is open, and several \$100 bills are scattered on the surface around it. The lighting is dramatic, highlighting the texture of the paper and the metallic sheen of the briefcase.

Day rates!

**But...what if this
works?**

Enter the **fakeholder!**



Ruud Rietveld

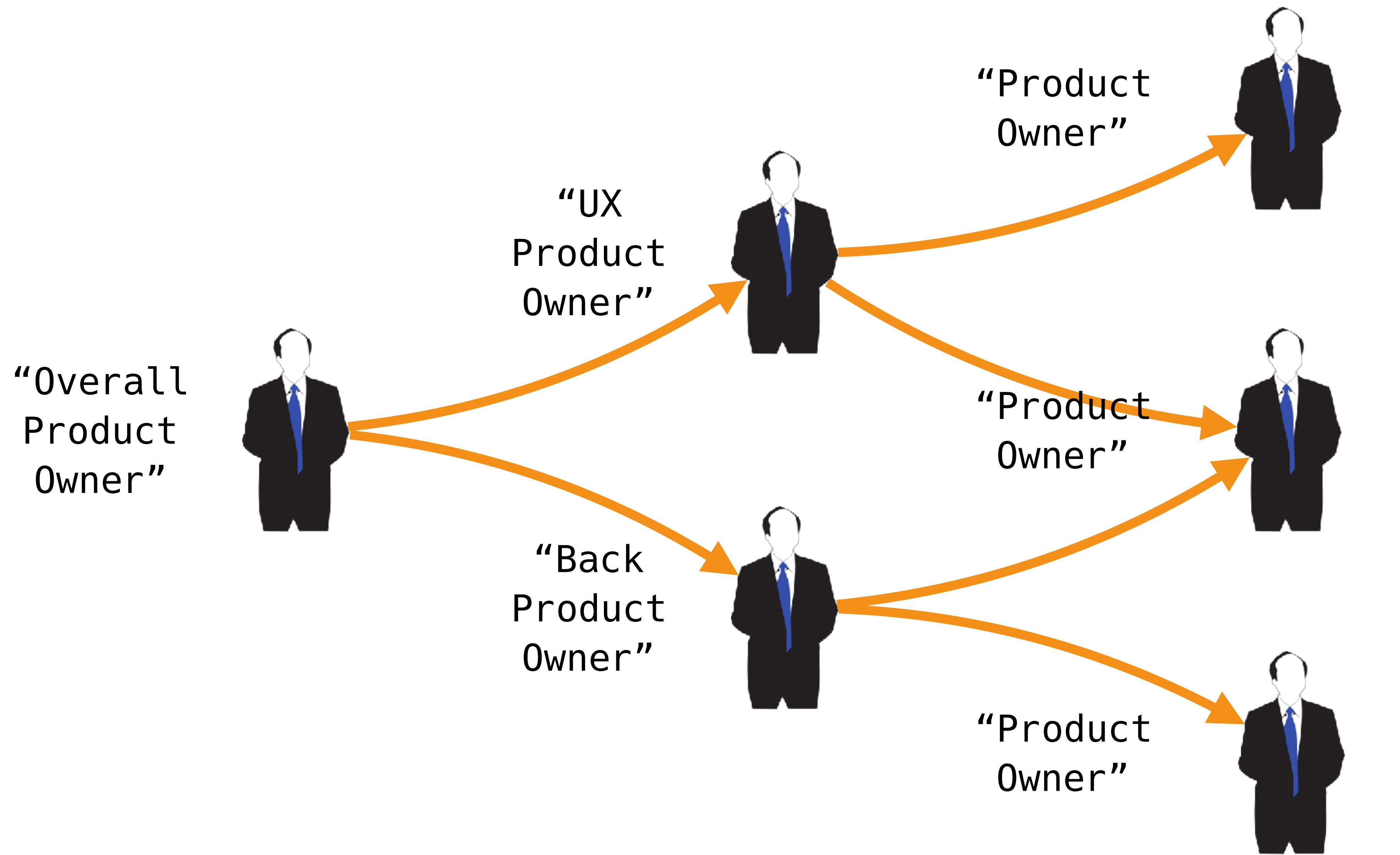
@RuudRiet

Follow



"Fakeholder" (n) - A person, posing as your stakeholder, that actually isn't talking to any user or other need whatsoever of your product.

2:52 PM - 13 Jul 2017



Doesn't care



Cannot decide

Even sounds “**agile**”!

Technical benefits?

Shared
stability

Frontend Microservice



Service Microservice



Persistence Stuff

Convolutated
domains

Shared
release

Programmers do not like **other people**

Nobody should have a **big picture**, keep
them in the dark

“**War rooms**” sound really important

Avoid **real ownership**

And: In case of **bugs**...

...it's always
the other team's fault

Wrapping up....

The **key** to failure is
the **hidden** monolith

Microservices mean work

Brownfield - **The perfect excuse**

Think of the **organisational** impact

Never involve **Ops** or **Business**

Microservices **are a fad**

Embrace the **monolith**

Thank you!

Questions? Disagree? Let's talk!
@Koenighotze