

An elephant is the central focus, standing in a lush forest. Sunlight filters through the trees, creating a bright, hazy atmosphere. The elephant is facing slightly to the left of the frame.

The Elephant in the Kubernetes Room

Team Interactions at Scale

Manuel Pais, Consultant
co-author of *Team Topologies* - @manupaisable

KubeCon North America 2019, San Diego

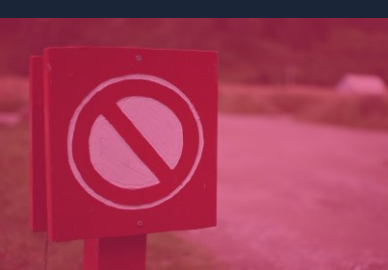
 **Team
Topologies**

#KubeCon

TeamTopologies.com
@TeamTopologies



Kubernetes as a Platform



Dev and Ops Equilibrium

Team Cognitive Load



Team Interactions



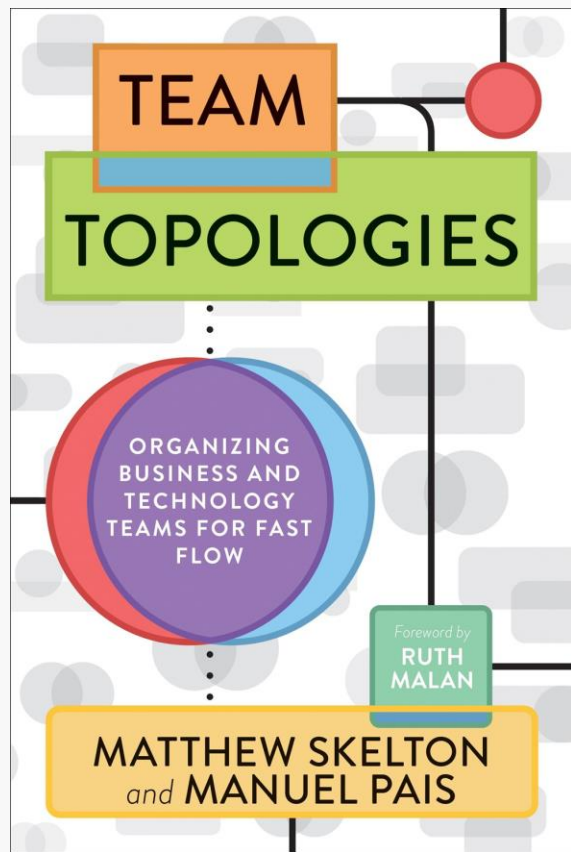
Team Topologies

Organizing business and technology teams for fast flow

Matthew Skelton & Manuel Pais

IT Revolution Press (2019)

<https://teampologies.com>



Kubernetes as a platform

DEVOPS

The next QCon is in [San Francisco, November 11-15, 2019](#). Save an extra \$100 with [INFOQ100!](#)

How Airbnb Simplified the Kubernetes Workflow for 1000+ Engineers

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by Manuel Pais

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[Melanie Cebula](#), infrastructure engineer at Airbnb, gave a [talk at QCon London](#) [slides PDF] about the internal tooling and strategies Airbnb adopted to support over 1000 engineers concurrently configuring and deploying over 250 critical services to Kubernetes (at a frequency of about 500 deploys per day on average). One key enabler was a layer of abstraction and generation of Kubernetes configuration from higher level primitives using standardized environments and namespaces (and automated validations whenever possible). Also critical was the automation of common workflows for engineers and using the same tools across all environments.

Source: <https://www.infoq.com/news/2019/03/airbnb-kubernetes-workflow>
Melanie's talk: <https://www.infoq.com/presentations/airbnb-kubernetes-services>

DEVOPS

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QL Pinned english Q +

FILTERING

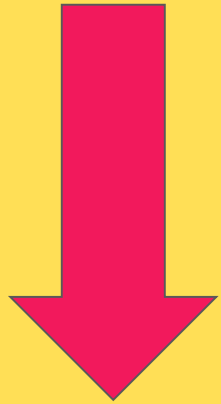
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terms must field: author value: Manuel Pais

URL

Value	Count	Author	Published date	Action
How Airbnb Simplified the Kubernetes Workflow for 1000+ Engineers	23401	Manuel Pais	2019/03/08 16:30:00	🔍

Kubernetes platform



microservices
ops complexity

Kubernetes platform



**deploy & run
abstractions**



Still need to...

... set up hosts

... create/destroy clusters

... update to new K8s versions

... decide on namespaces vs clusters

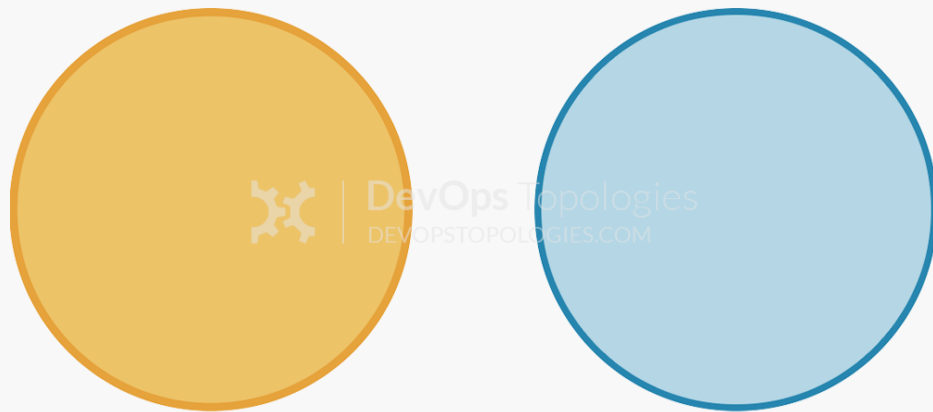
<insert your fav chore here>

Who is responsible ?

Who is responsible ?

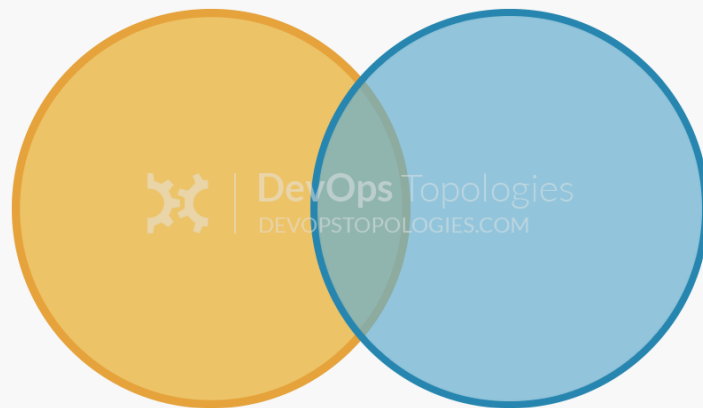
Who is impacted ?

Dev and Ops: a fragile equilibrium



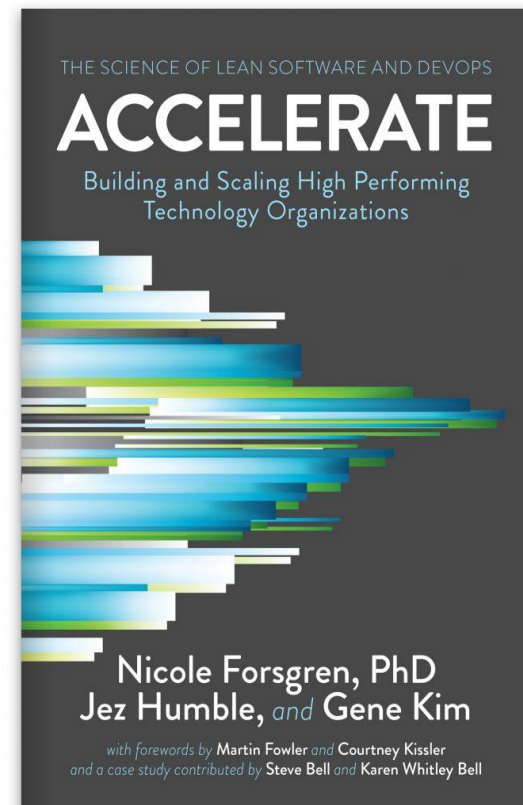
• Dev

• Ops



● Dev

● Ops



<https://cloud.google.com/blog/products/devops-sre/the-2019-accelerate-state-of-devops-elite-performance-productivity-and-scaling>

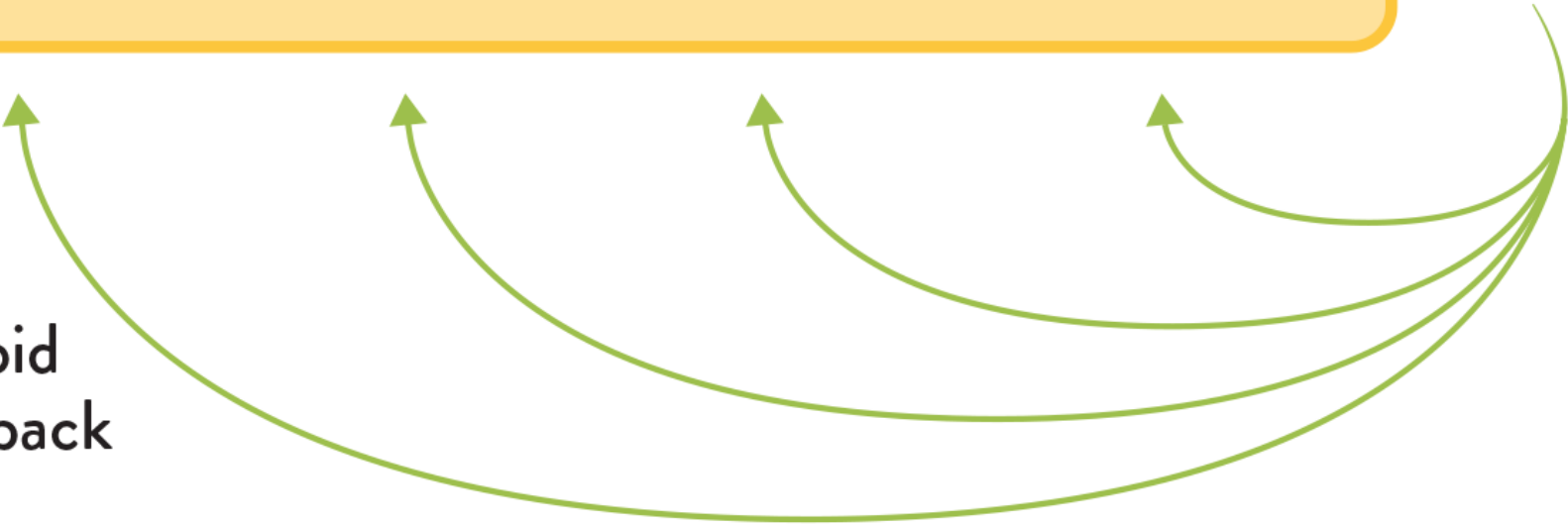


● Dev ● Ops



LIVE

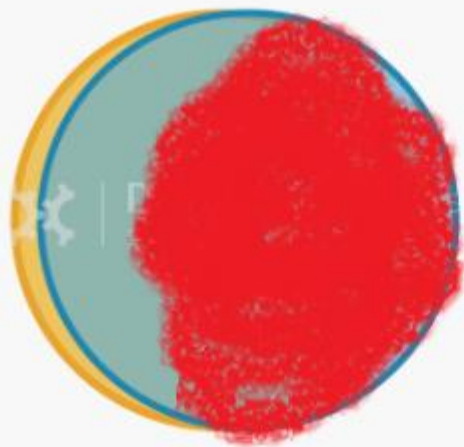
Rapid
Feedback



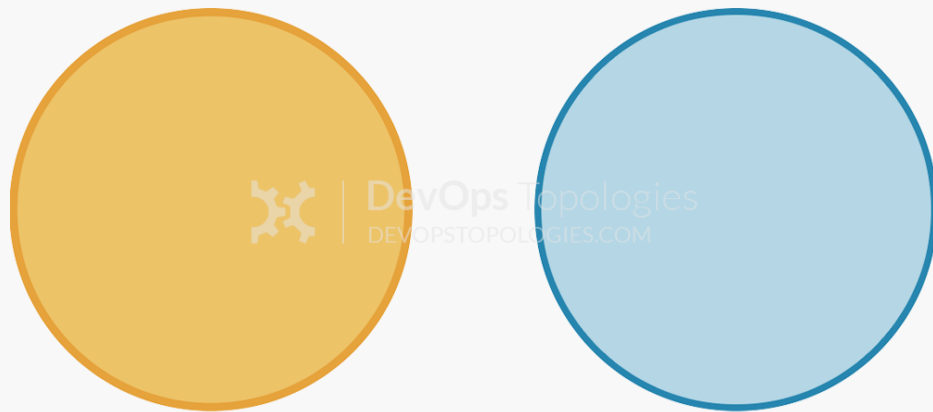




● Dev ● Ops



● Dev ● Ops  *Kubernetes*

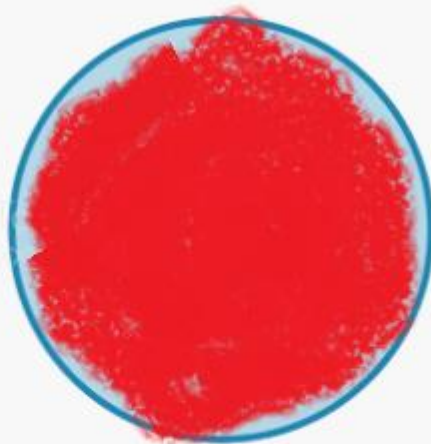


• Dev

• Ops



• Dev



• Ops



Kubernetes

Team Cognitive Load



Kelsey Hightower ✓

@kelseyhightower



If I had to do it all over again, I might leverage something like Kubernetes, but it would be hidden underneath some change management system, and would be considered an implementation detail.



Kelsey Hightower ✓ @kelseyhightower · Oct 1

Thinking back, I was able to do 95% of what we call Cloud Native with a bunch of VMs, an application server, and configuration management tools.

Once I integrated with the change management process so could the rest of the organization.

2:01 AM · Oct 1, 2019

“Cognitive load is the total amount of mental effort being used in the working memory”

- John Sweller

Cognitive load

Intrinsic (skills)

Extraneous (mechanics)

Germane (business focus)

Cognitive load



Intrinsic (skills)



Extraneous (mechanics)

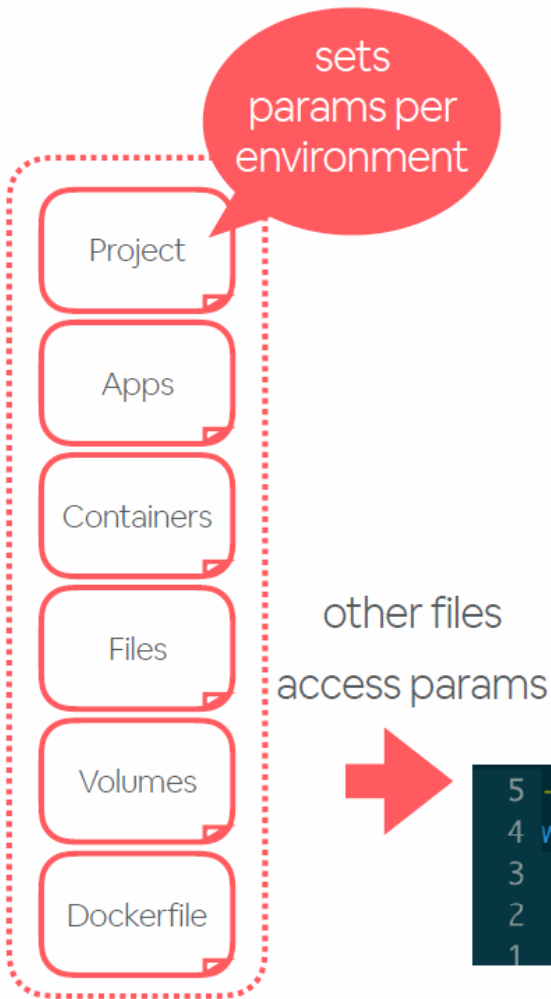


Germane (business focus)

“The best part of my day is when I update 10 different YAML files to deploy a one-line code change.”

“The best part of my day is when I update 10 different YAML files to deploy a one-line code change.”

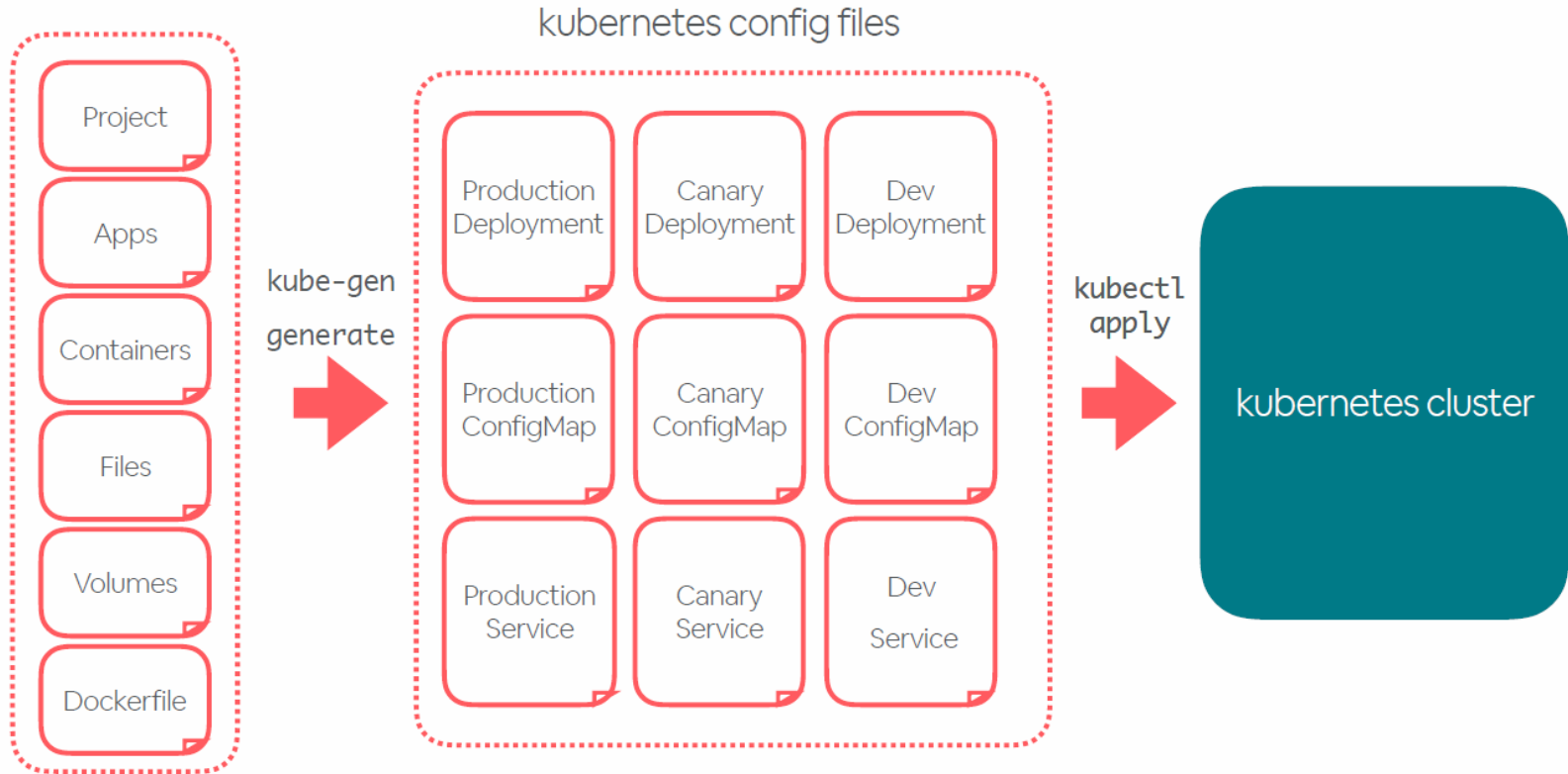
– No One, Ever



```
15 ---
14 version: 29.14.0
13
12 project:
11   name: bonk
10
9   environments:
8     production:
7       params:
6         replicas: 10
5
4     staging:
3       params:
2         replicas: 1
```

```
5 ---
4 workload:
3   deployment:
2     replicas: {{ .Env.Params.replicas }}
1
```

generating k8s configs



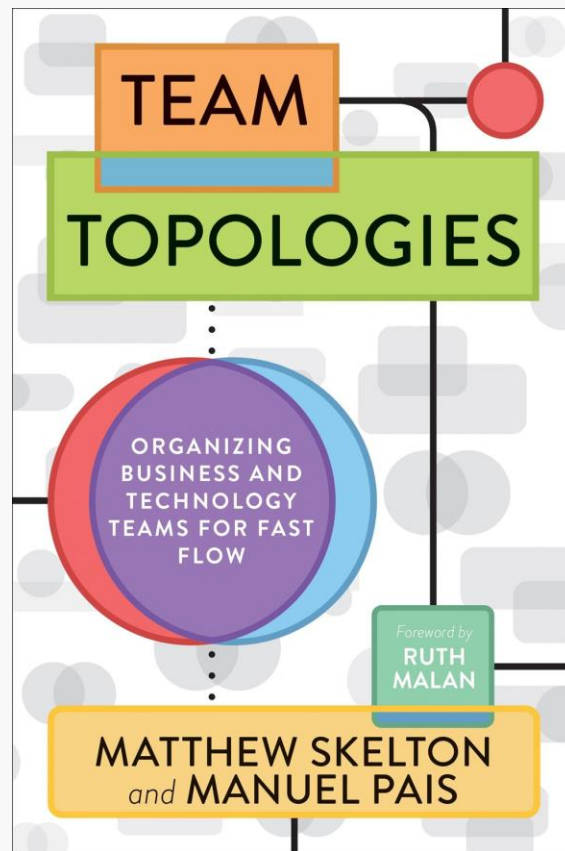
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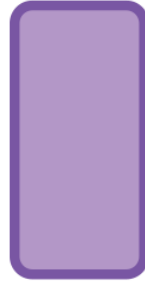
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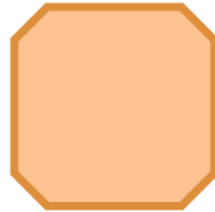




Stream-aligned team



Enabling team



Complicated subsystem team



Platform team



Stream-aligned team



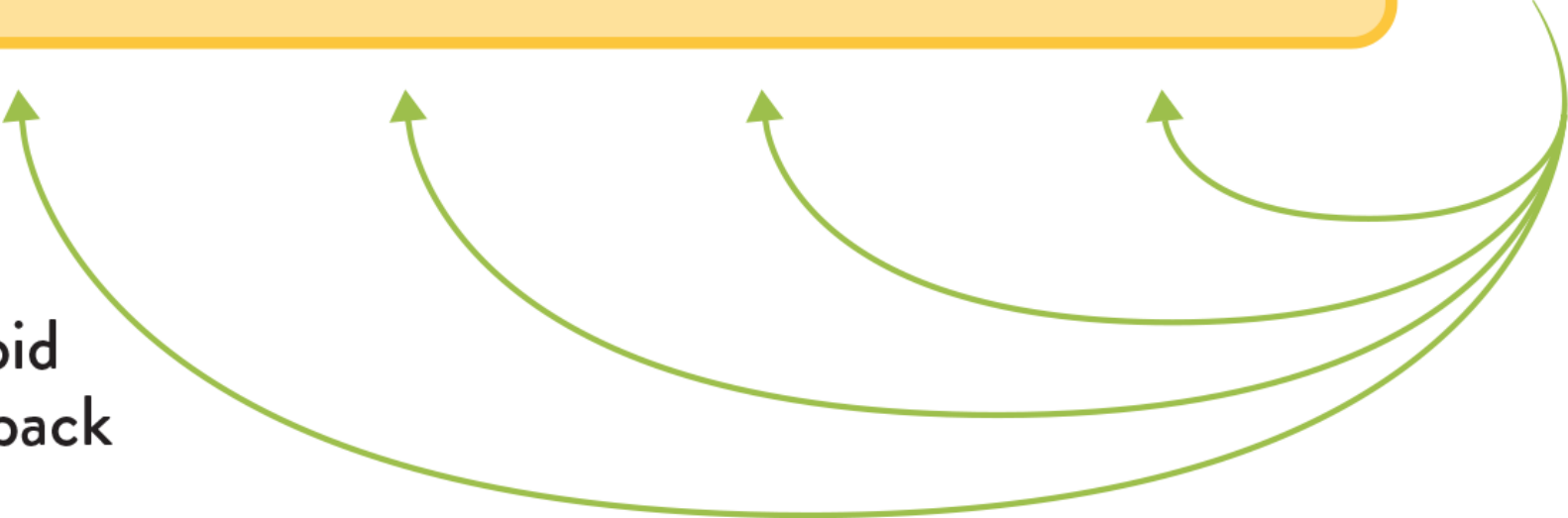
Platform team





LIVE

Rapid
Feedback

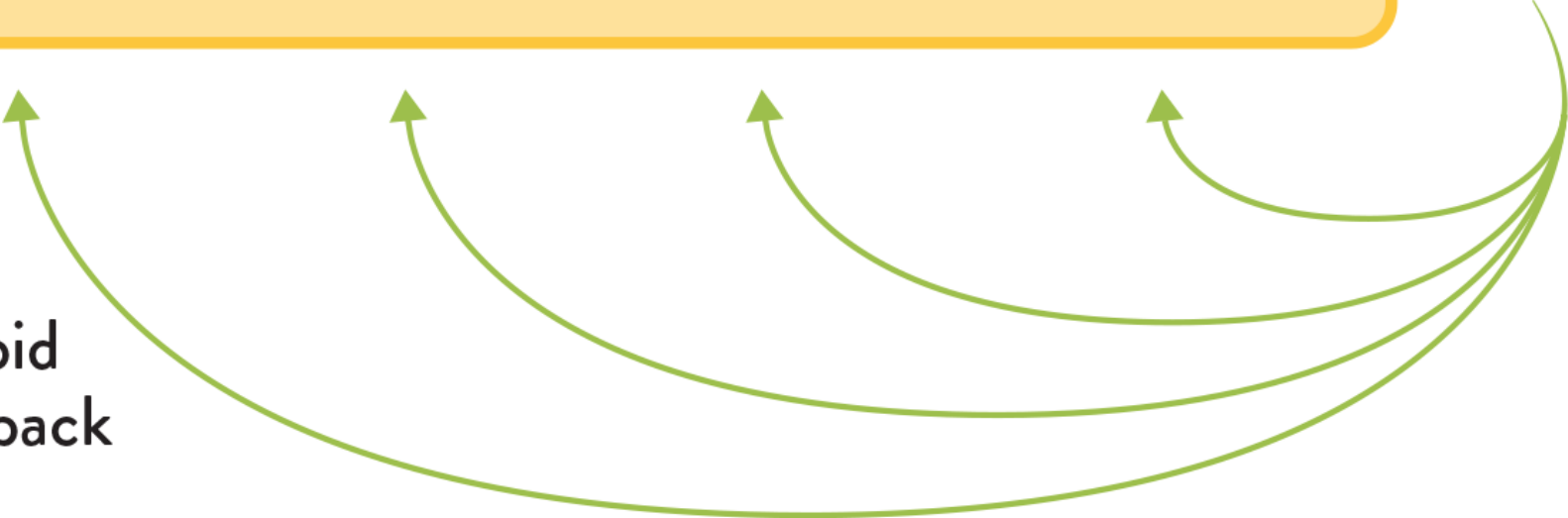




Stream-Aligned Team

LIVE

Rapid
Feedback



Platform Purpose



enable stream-aligned teams to deliver work autonomously with **self-service capabilities ...**

Platform Purpose



... in order to reduce
extraneous cognitive load
on stream-aligned teams

“A digital platform is a foundation of self-service APIs, tools, services, knowledge and support which are arranged as a compelling internal product.”

– Evan Bottcher, 2018





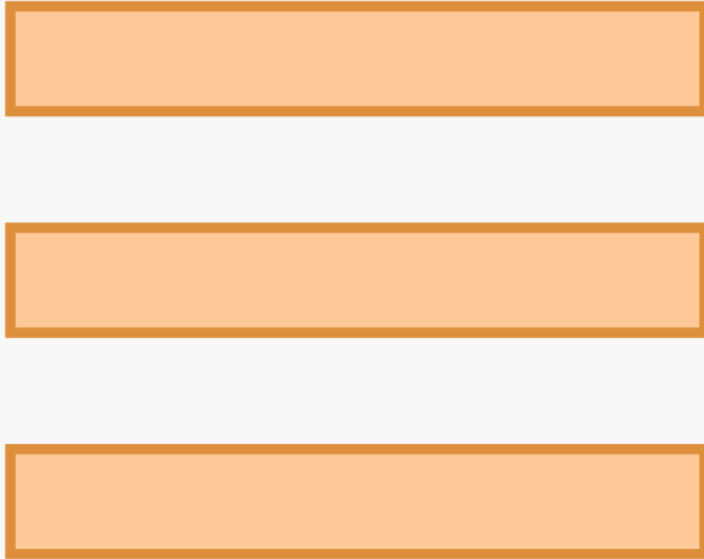
**A good platform is
treated as a product
(reliable, usable,
fit for purpose)**

Team Interactions

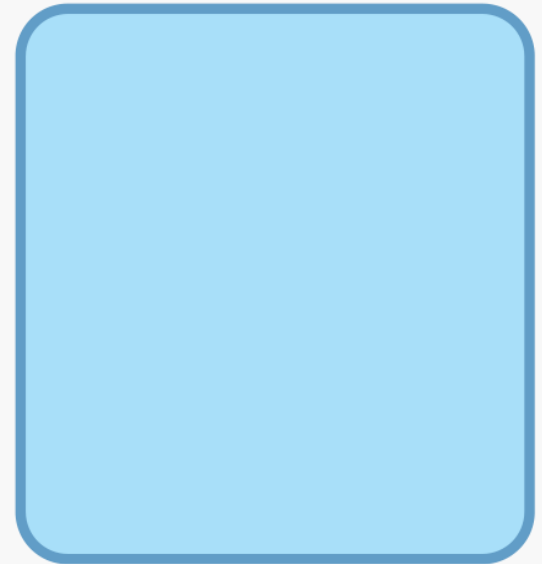
Flow



Dev Teams

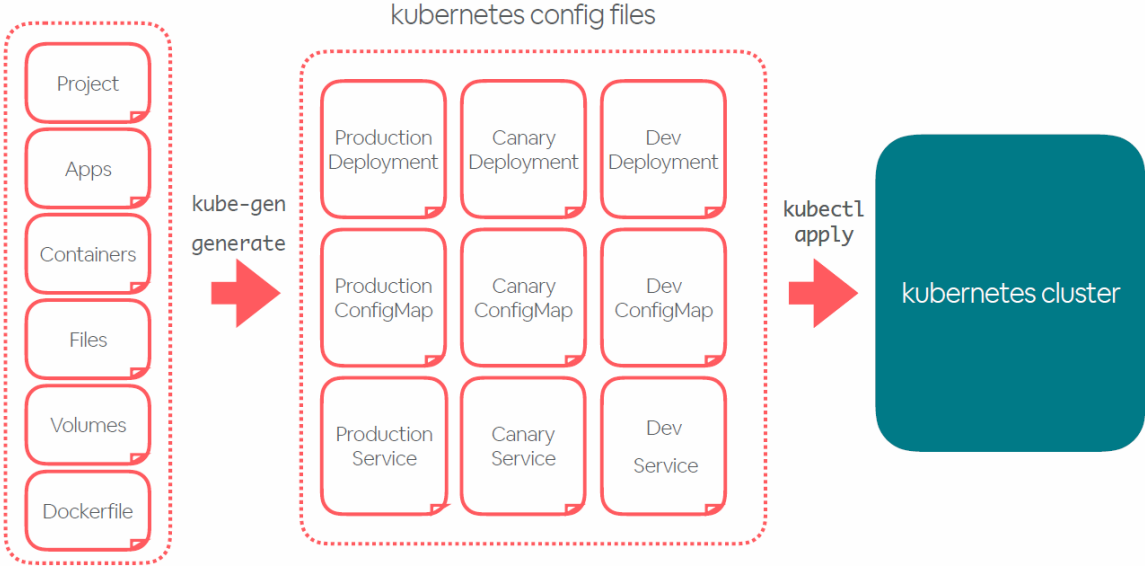


Infrastructure

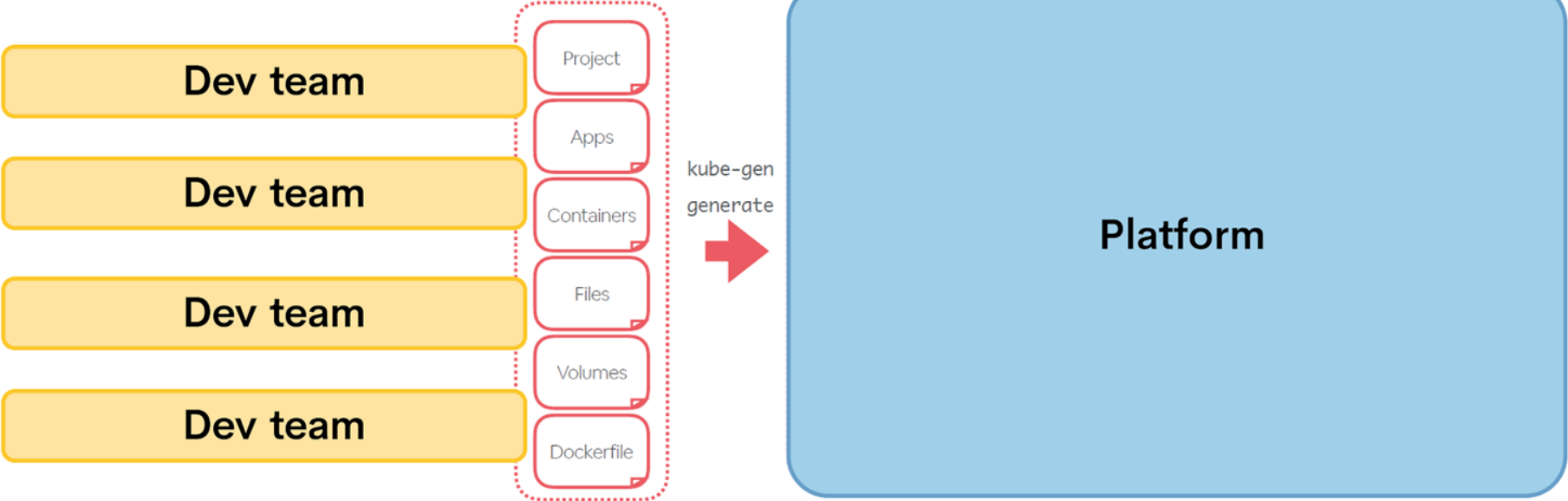


Handover

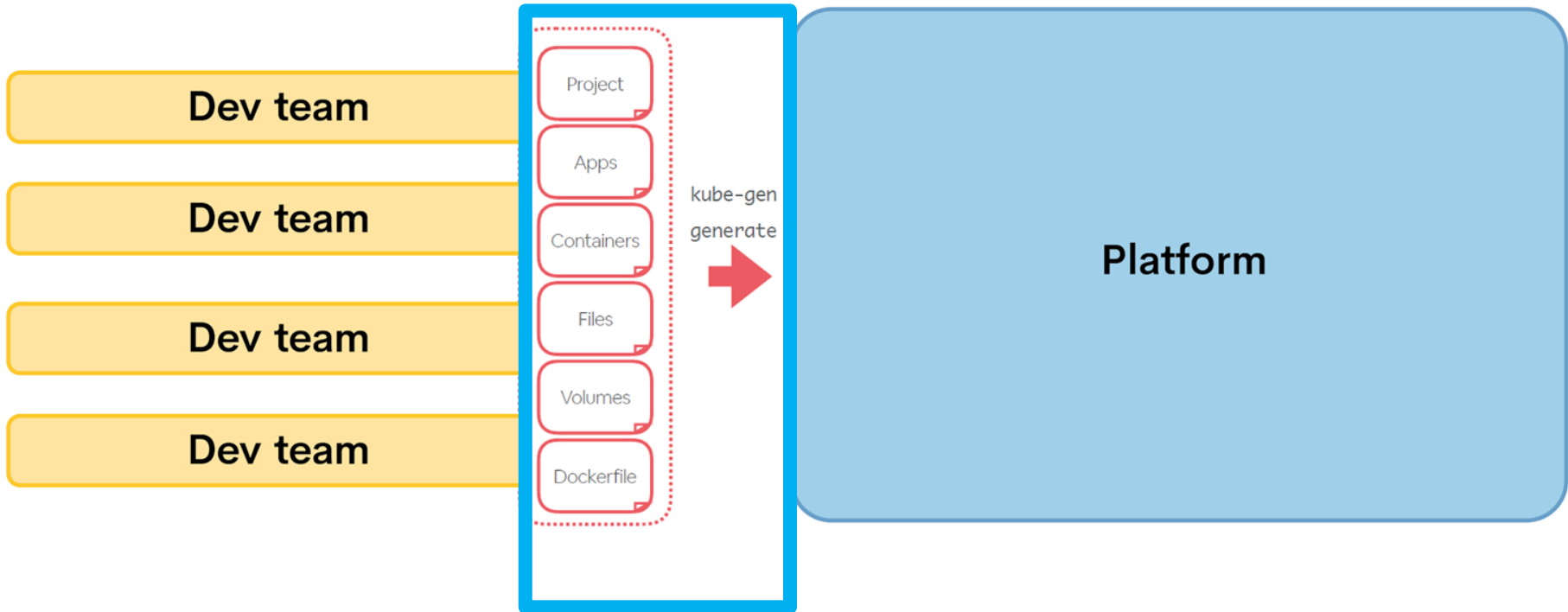
generating k8s configs



generating k8s configs

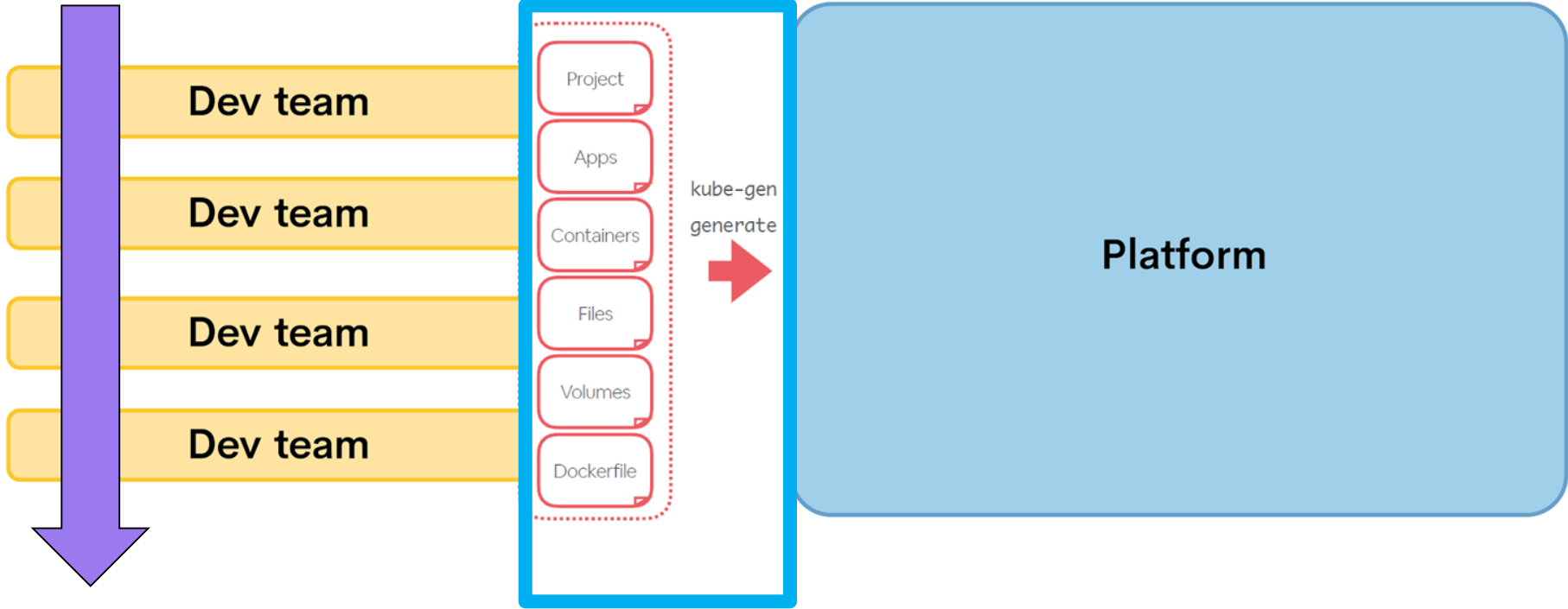


generating k8s configs



service boundary

generating k8s configs



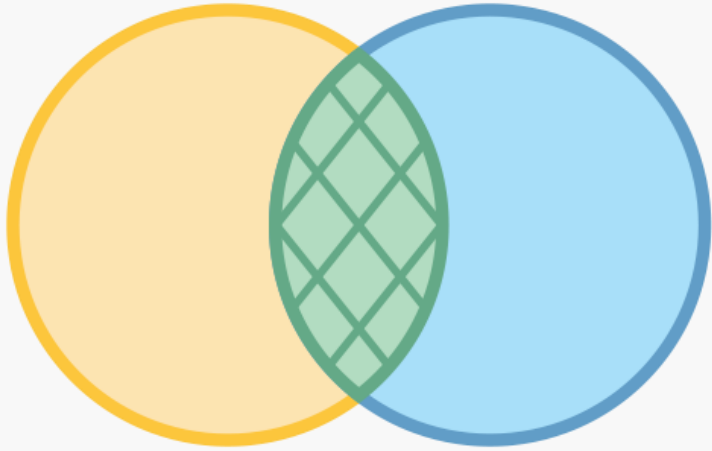
cognitive load

service boundary

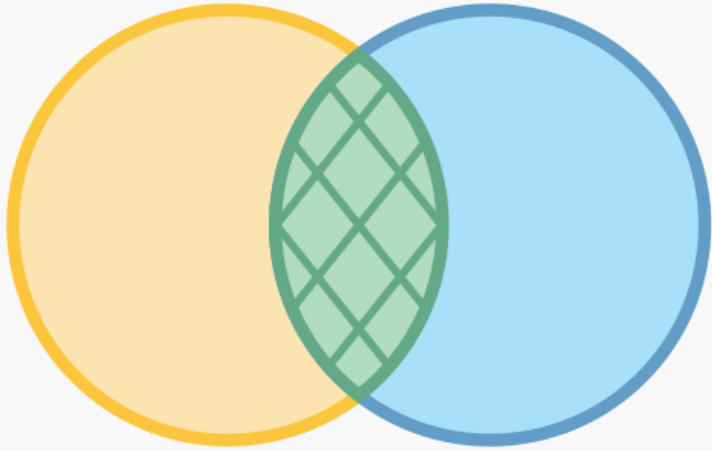
Platform Behaviors



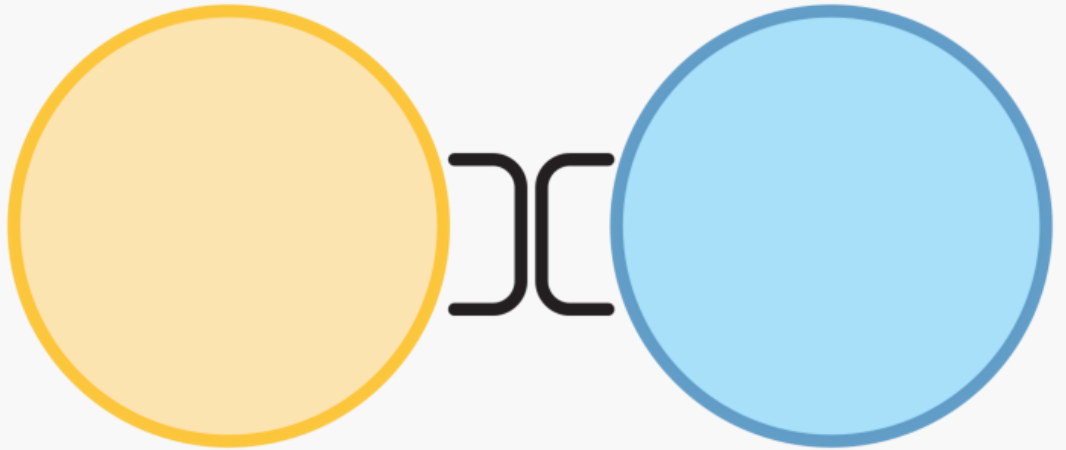
**strong collaboration with
stream-aligned teams for
any new service or evolution**



Collaboration



Collaboration



X-as-a-service

Platform as a Product



on-call support
service status pages
suitable comms channels
response time for incidents
downtime planned & announced

Platform Behaviors



great product management

fast prototyping

fast feedback



AGREE OR DISAGREE

BUILD

I can effectively build my software.

I have the tools to validate my software.

DELIVER

I can reliably deliver my software to dev, stage, and prod.

I can efficiently manage my cloud infrastructure.

RUN

I can measure the operational metrics of my services.

In understand the cost of running my service.

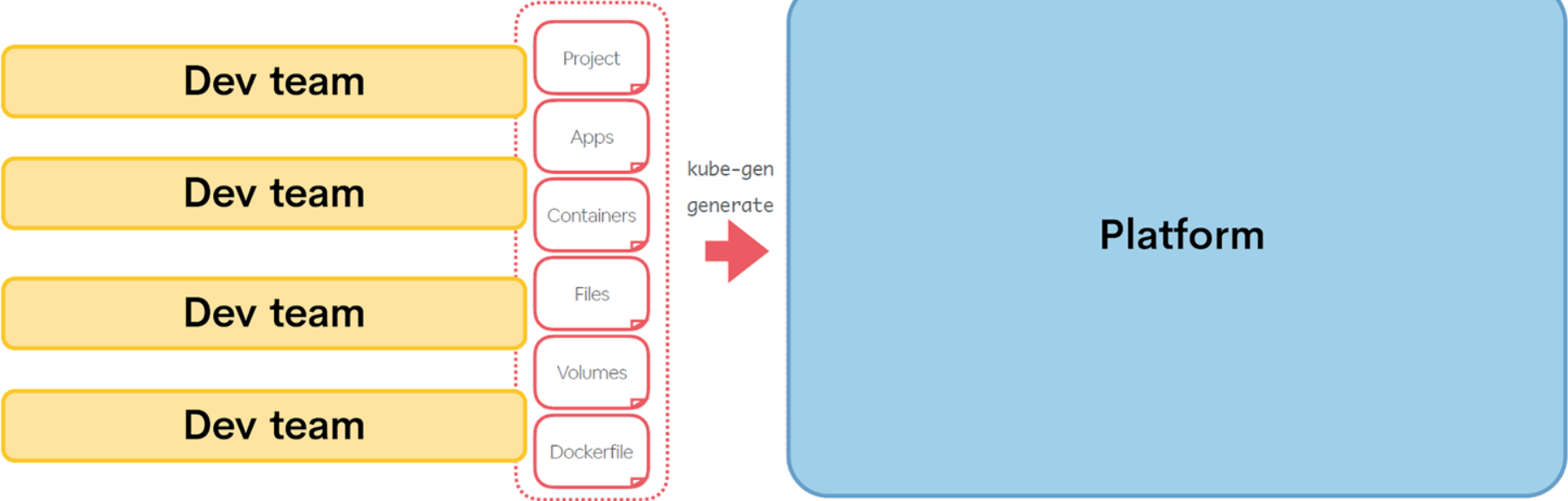
COMPELLING

I feel platform tools are consistently improving.

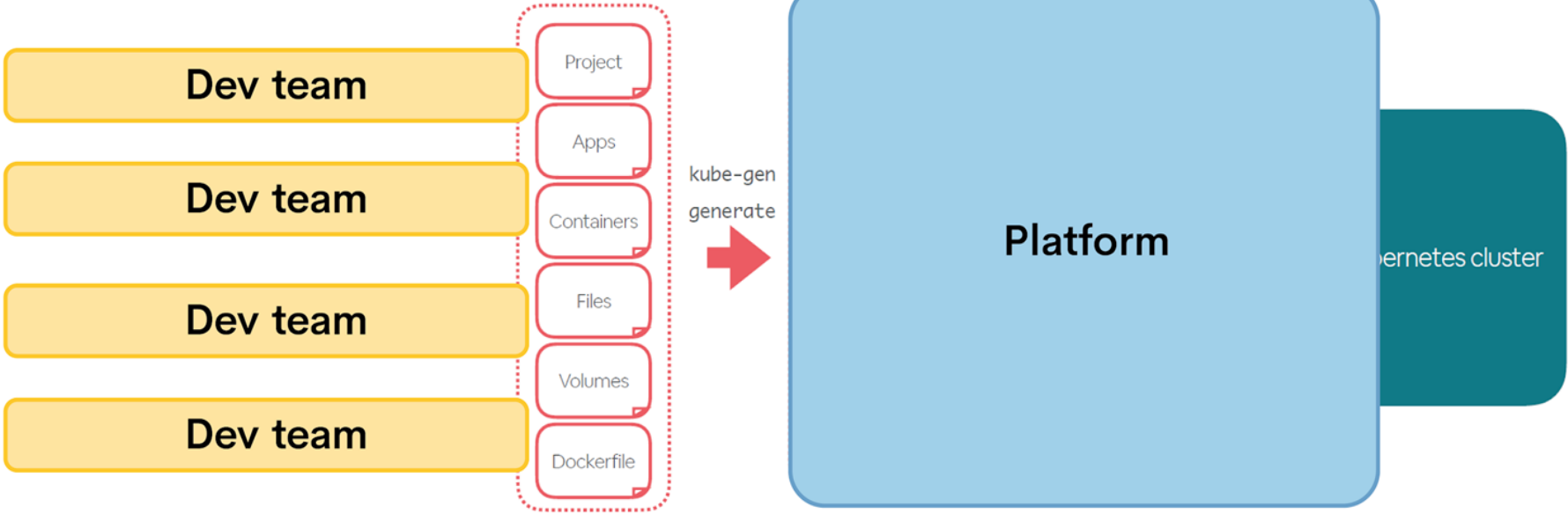
I can voice problems that result in improvements.

My tools are best in class.

generating k8s configs



generating k8s configs



Dev team

k gen

k deploy

k diagnose

...

Infrastructure team



Dev team

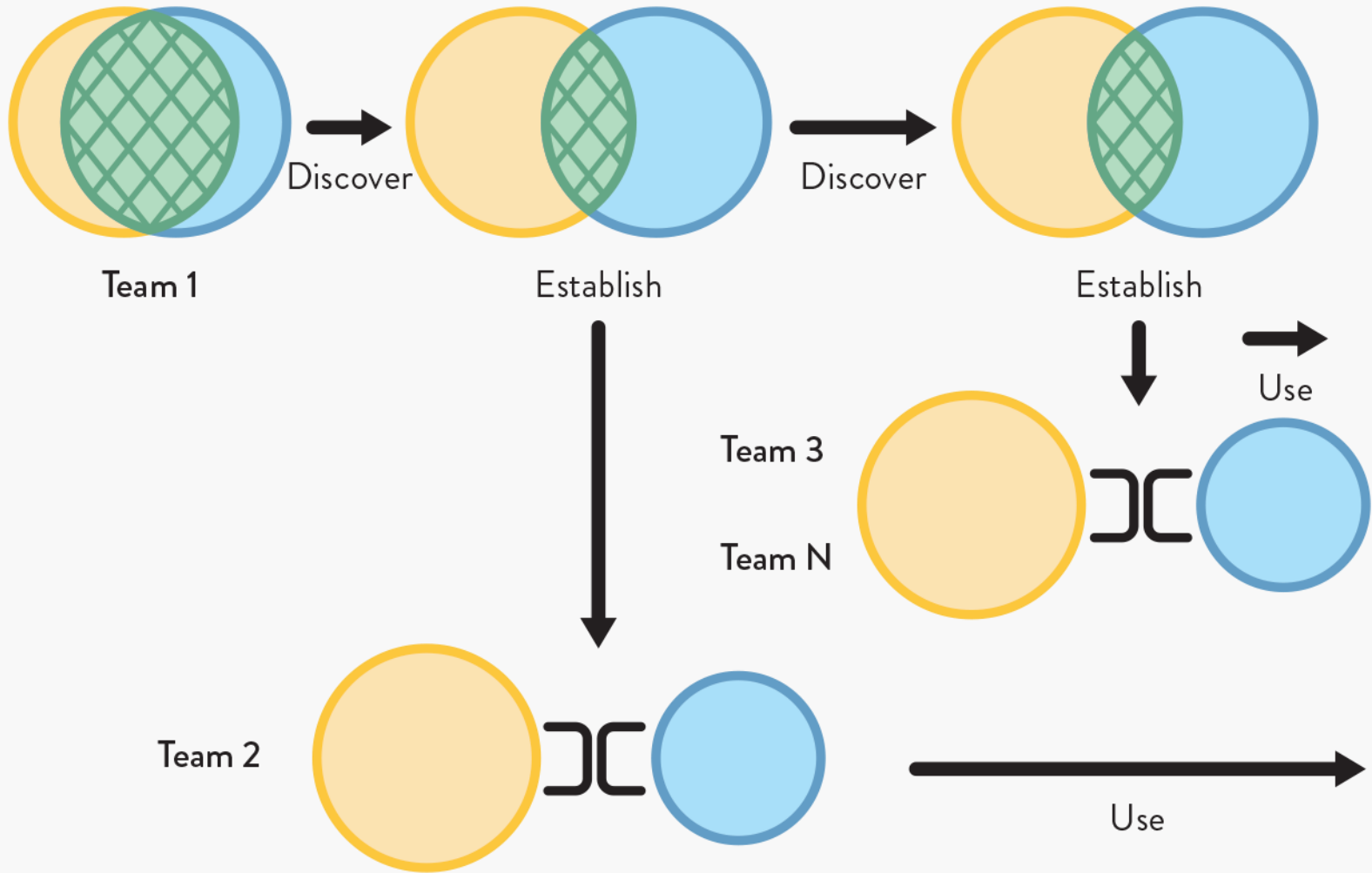
k gen

k deploy

k diagnose

k metrics

Infrastructure team



More platform examples



Zalando [Kubernetes at Zalando](#)



Mercedes [DevOps Adoption at Mercedes-Benz.io](#)

Twilio [Platforms at Twilio: Unlocking Developer Effectiveness](#)

Adidas [Where Cloud Native Meets the Sporting Goods Industry](#)

ITV [ITV's Common Platform v2 Better, Faster, Cheaper, Happier](#)

MAN Truck & Bus [How to Manage Cloud Infrastructure at MAN Truck & Bus](#)

Farfetch [UX | DevOps - The Trojan Horse for Implementing a DevOps Culture](#)

Thank you!

teamtologies.com



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Manuel Pais, Independent
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Convergence to Kubernetes

Standardisation to Scale

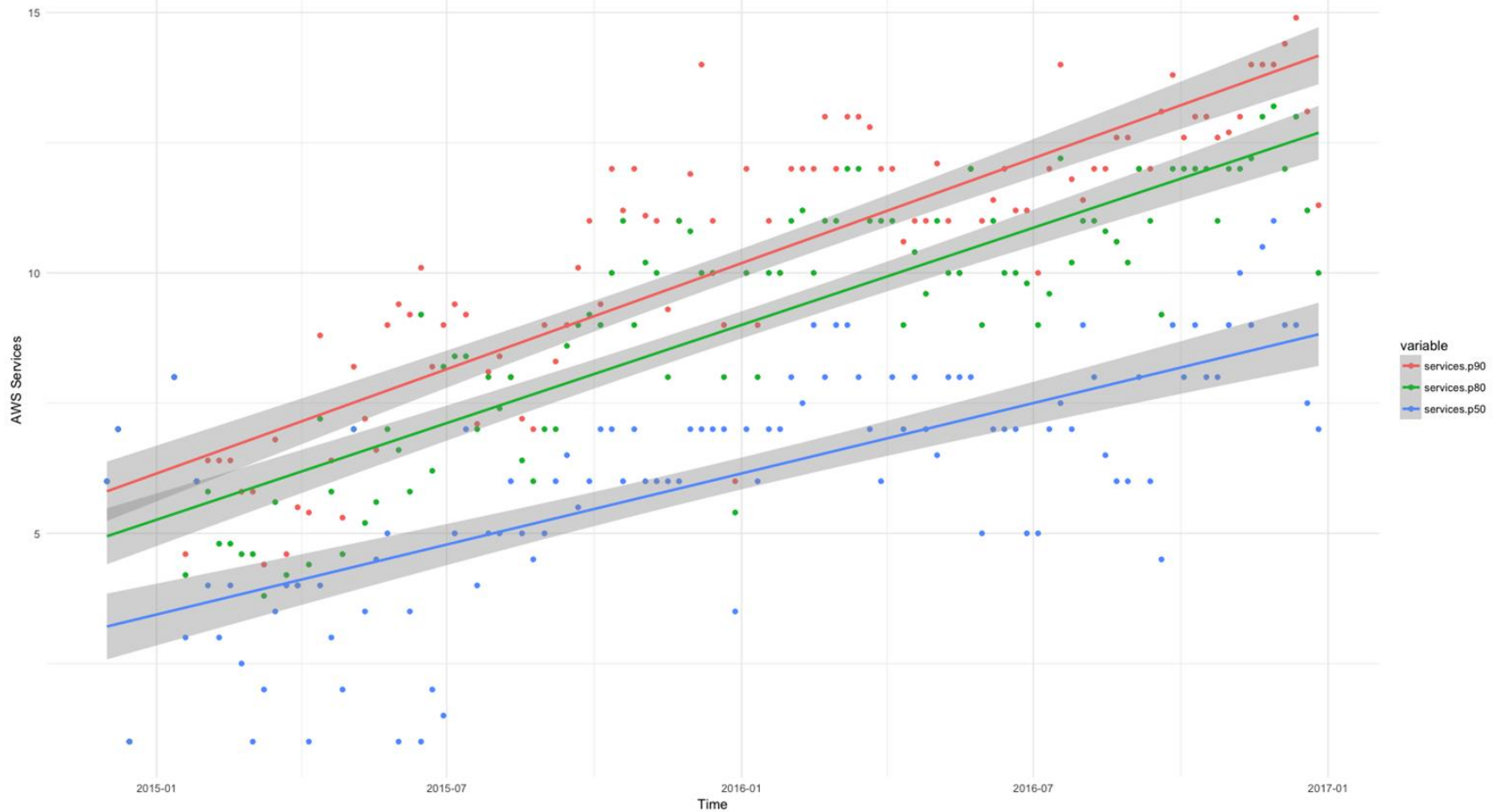


Paul Ingles

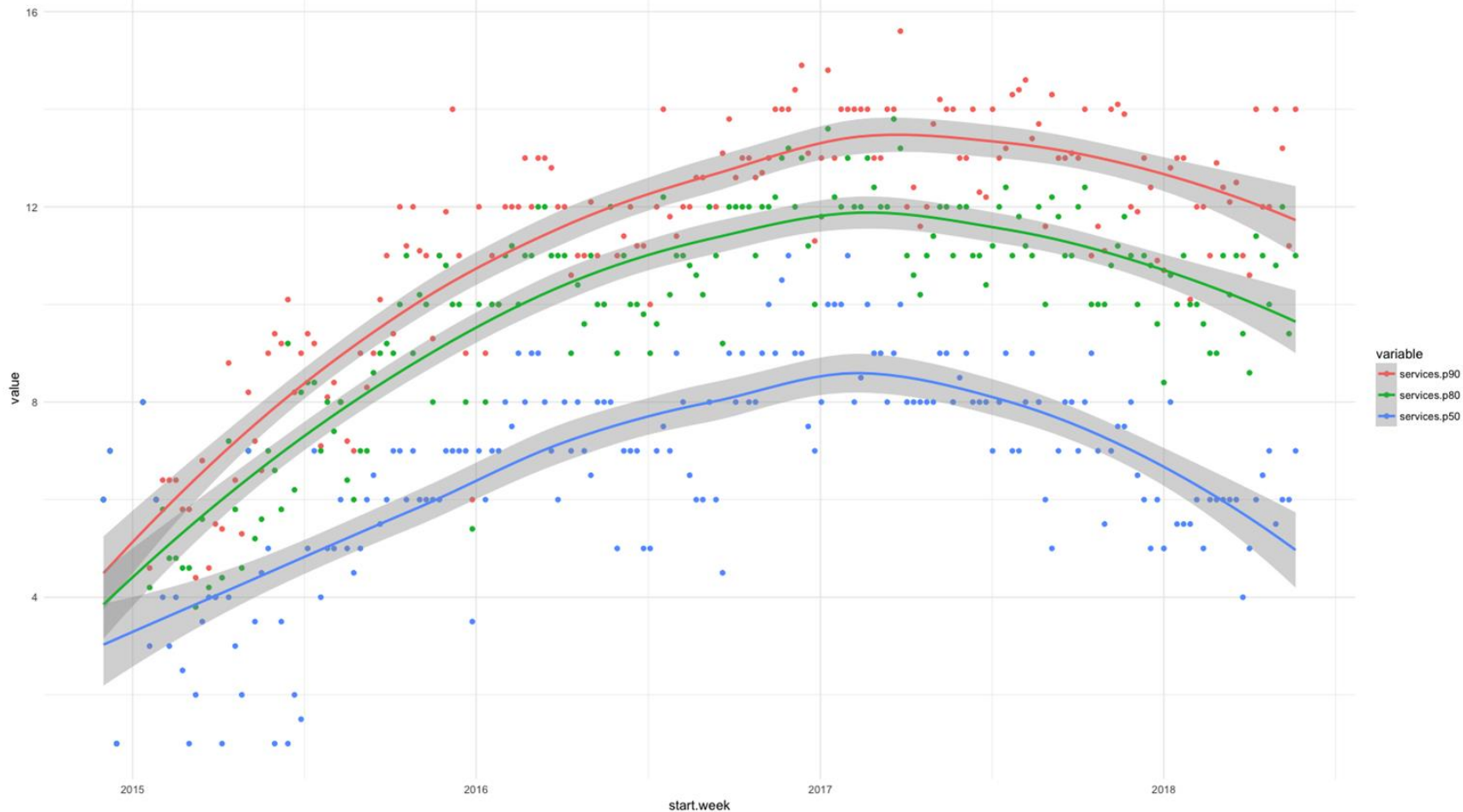
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Jun 18, 2018 · 13 min read

Source: <https://medium.com/@pingles/convergence-to-kubernetes-137ffa7ea2bc>



Low-level AWS service calls (EC2, IAM, STS, Autoscaling, etc.) from January 2015 to January 2017



Low-level AWS service calls since Kubernetes adoption in January 2017

*“We didn’t change our organization because we wanted to use Kubernetes, **we used Kubernetes because we wanted to change our organization.**”*

- Paul Ingles

*“Teams don’t realise how much they
haven’t had to do.”*

- Paul Ingles’ boss on using K8s