

Switching Horses Midstream

The challenge of migrating 150
microservices to Kubernetes

Euan Finlay
@efinlay24



@efinlay24



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/usr/bin/whoami

`/usr/bin/whodoiworkfor`

No such file or directory.

fastFT

South African rand sinks to three-week low amid political woes 1H AGO

Israel appoints Wharton professor as central bank chief 1H AGO

Turkey asks businesses for price cuts to fight inflation 1H AGO

US stock futures slip as bond yields march higher 2H AGO

FT Trading Room

BoE warns EU that £41tn of derivatives at risk after Brexit

UK central bank predicts Europe will bear cost of disruption to clearing if no action taken

- DUP reiterates Brexit 'red line' to Brussels
- UK seeks reforms on overseas aid spending
- How Brexit may widen east-west divide



The Big Read

AI: how humans can coexist with robots



Insurance

Aviva pushes out chief as it cites need for 'new leadership'

Mark Wilson leaves with immediate effect after six years at the helm



Italy's Tria fails to halt market fears over budget

Finance minister concerned by borrowing costs but says coalition will stick to plans

NEW 29 MINUTES AGO



Accounting & Consulting services

CMA launches investigation into audit sector

UK regulator responds to widespread concerns over conflicts of interest 3 HOURS AGO



Technology sector

Sony commits to successor for PlayStation 4

Next generation hardware is 'necessary', says president of Japanese group



FINANCIAL
TIMES

IQUEST

<https://www.ft.com>

<https://www.iquestgroup.com>

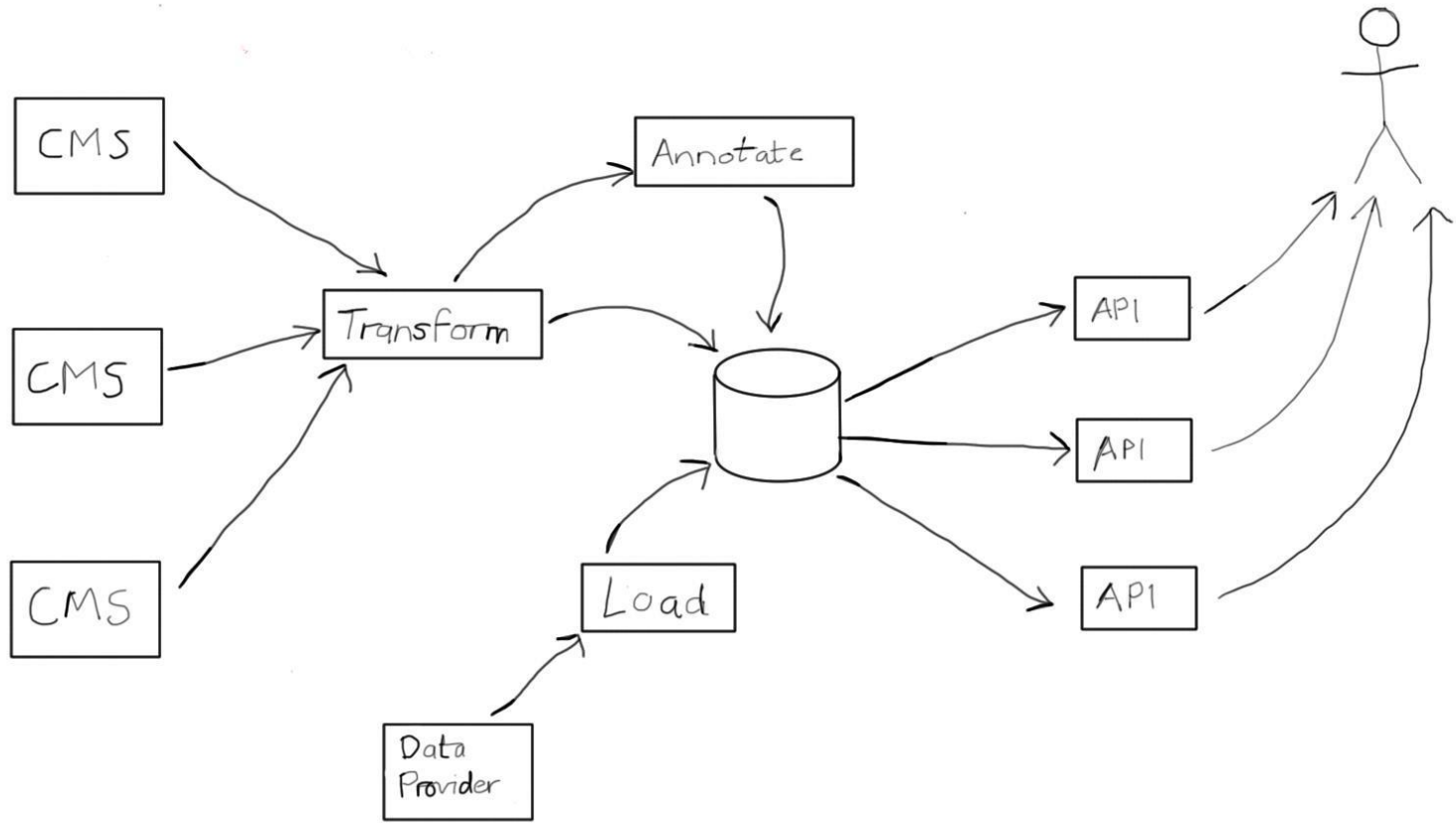


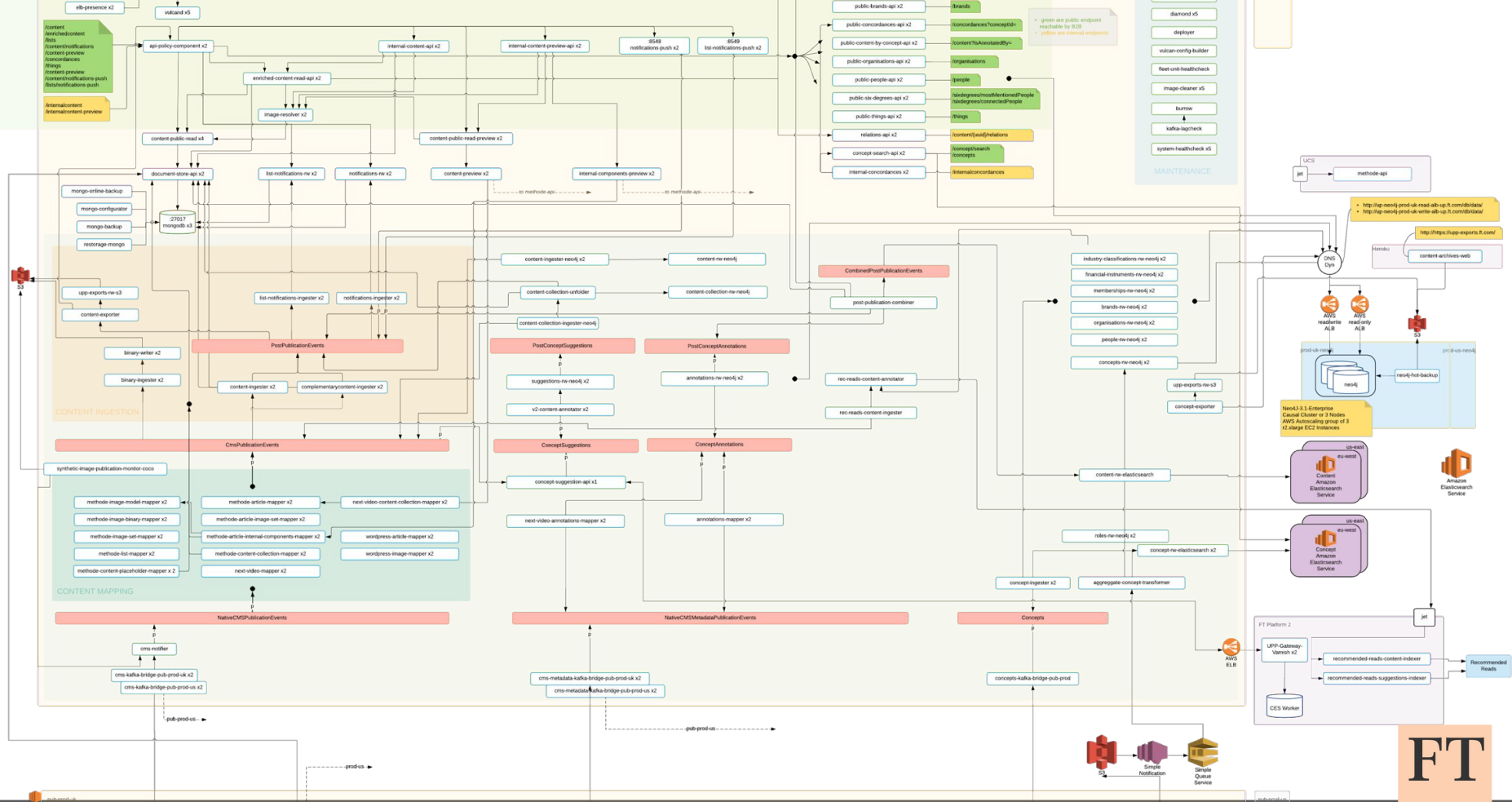


docker.

aws







@efinlay24

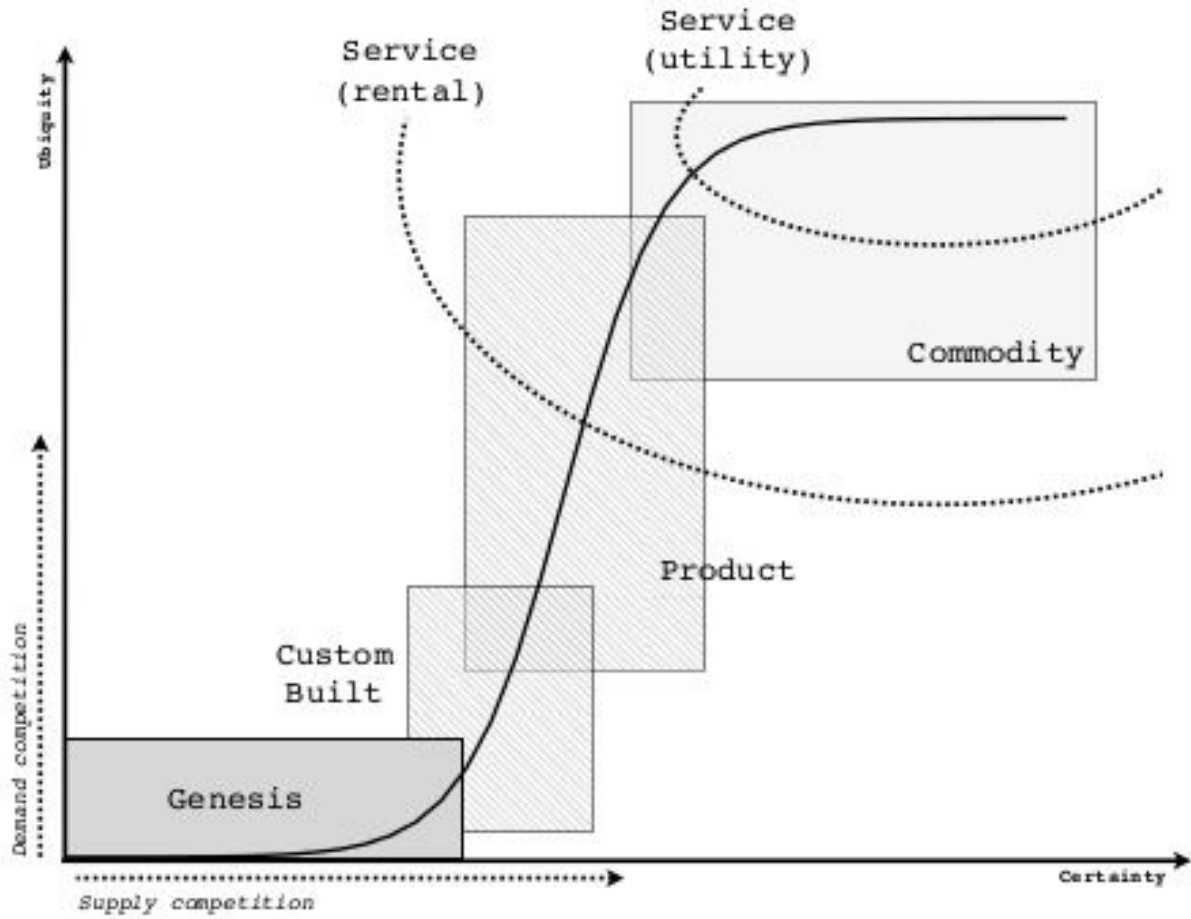
**Running highly available
services is complicated.**

2015 > Docker in production.

2016

2017

2018



Spend your innovation tokens wisely.

<http://mcfunley.com/choose-boring-technology>

**For us, the benefits
outweighed the risks.**

**Our AWS costs dropped
by around 40%.**

**It was much easier to build
and deploy new services.**

However, supporting a home-built platform can be difficult.

**It's even harder when you don't
fully understand how it works.**

Choose boring technology.

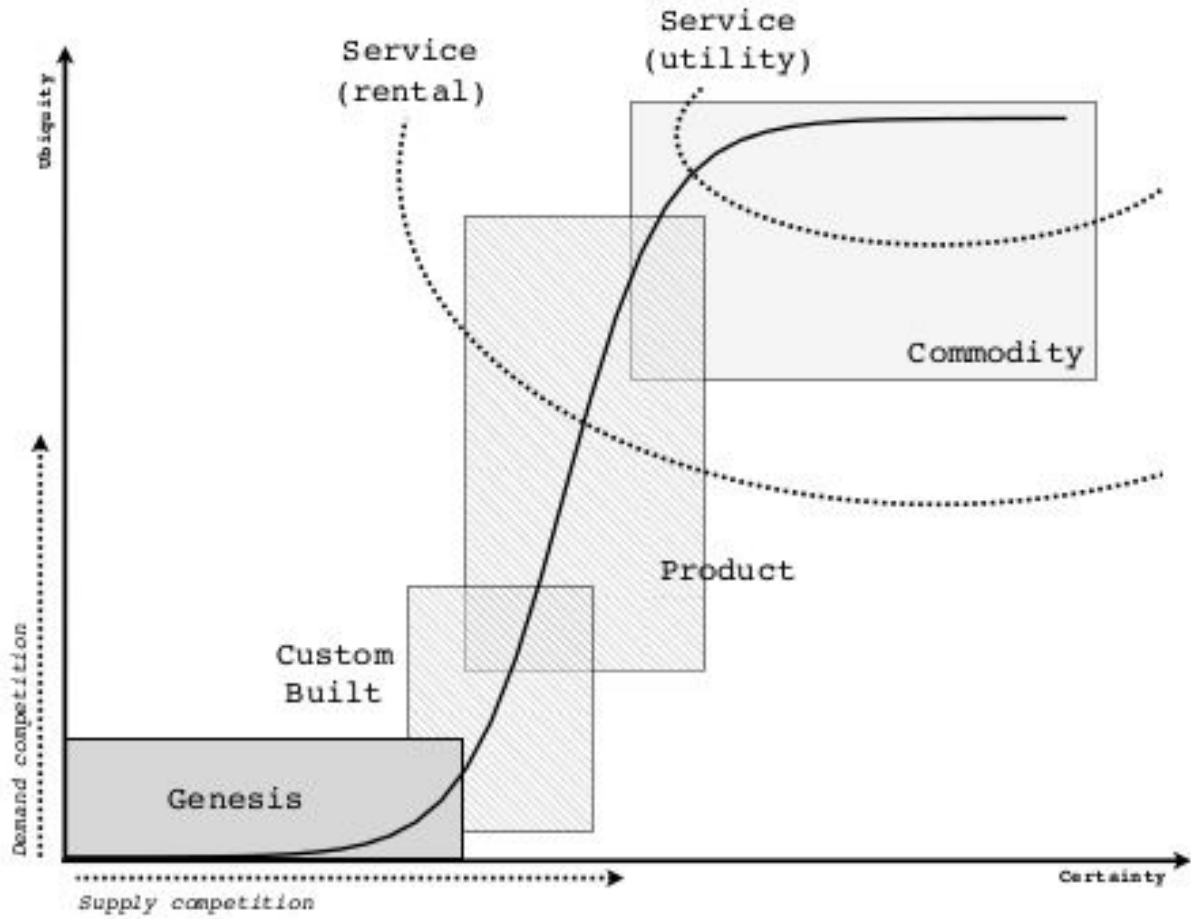
<http://mcfunley.com/choose-boring-technology>

2015

2016 > Tools started maturing.

2017

2018



**We are not a cluster
orchestration company.**

In late 2016, we started to investigate alternatives.

Metric for success #1:

**Reduce the amount of time spent
keeping production healthy.**

Metric for success #2:

**Reduce the number of
sarcastic comments on Slack.**

dynamic-publishing - Dec 16th, 2016



[redacted] 🙌 19:12

Gordon Ramsay will fix this

🍷🍷 2 reactions

dynamic-publishing - Dec 16th, 2016



[redacted] 💬 19:08

coco Pete will fix this

dynamic-publishing - Dec 16th, 2016



[redacted] 18:53

k8s will fix this.

dynamic-publishing - Oct 20th, 2016



[redacted] 19:41

"K8S will fix this"

dynamic-publishing - Sep 29th, 2016



[redacted] 16:46

I am going to destroy SPAM/SPLiM in pub-dynpub as they are running properly but the sidekicks aren't running at all. Hopefully the deployer will fix this.

universal-publishing - Aug 15th, 2016



[redacted] 13:42

I would say "containerization will fix this" but given we've ensured our containers have unique IDs I guess you could end up with 2x Kafka rest proxy service, so maybe it won't.

We chose Kubernetes.





Liz Rice

@lizrice

Following

Which orchestrator are you using in
production? Please RT!

#containers #docker #Kubernetes #mesos
#hashicorp

25% Docker Swarm

61% Kubernetes

10% Mesos / Marathon

4% Nomad

367 votes • Final results

<https://twitter.com/lizrice/status/828872836777385984>

**Using leading edge technologies
requires you to be comfortable
with change.**



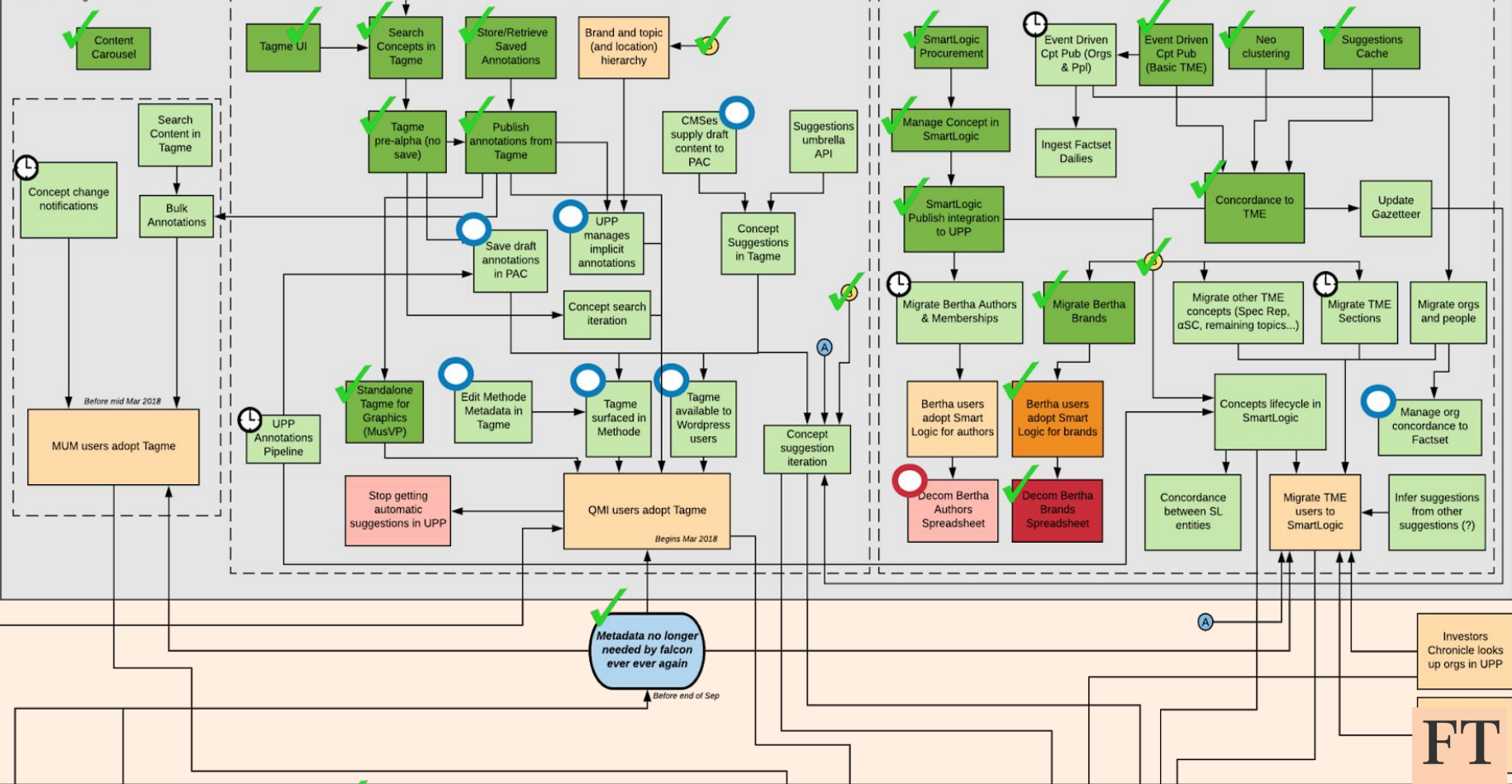
2015

2016

2017 > Kubernetes migration begins.

2018

Metadata Tooling work stream



**Running in parallel
complicates things further.**

**During our parallel run, there
were over 2000 code releases.**



[Get Helm](#)

[Blog](#)

[Docs](#)



The package manager for Kubernetes

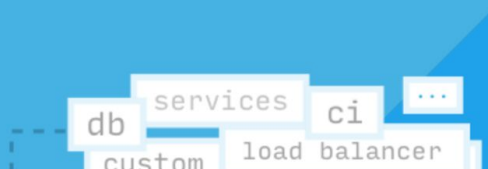
Helm is the best way to find, share, and use software built for Kubernetes.



What is Helm?

Helm helps you manage Kubernetes applications — Helm

<https://helm.sh/>

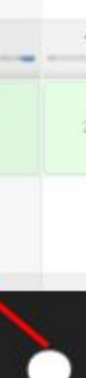
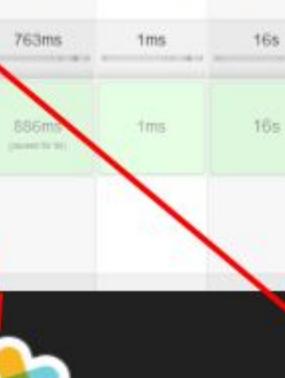




people-rw-neo4j-release - Stage View

Average stage times: (Average full run time: ~2min 20s)

	checkout	prepare credentials	build-image	push-image	Open CR for PRE-PROD	deploy-to-pre-prod	Close CR for PRE-PROD	Validate in PRE-PROD	Deploy to PROD	Open CR for PROD	deploy-to-prod	Close CR for PROD	Validate in PROD
	5s	830ms	1min 34s	12s	311ms	18s	1ms	696ms	763ms	1ms	16s	1ms	767ms
#34 Apr 11 10:12 cancel	3s	598ms	1min 25s	13s	343ms	19s	1ms	1s <small>(skipped by 20s)</small>	886ms <small>(skipped by 1s)</small>	1ms	16s	2ms	1s <small>(skipped by 20s)</small>
#33 Apr 11 10:10 No Changes	2s	489ms	1min 1s <small>aborted</small>										



**Each individual change wasn't huge,
but 150 small changes add up quickly.**

**Unfortunately, we discovered
a lot of broken things...**

**Some services hadn't been built
for a very long time.**

**Nightly builds can help,
even if you don't deploy them.**

Not all of our service health endpoints worked correctly.

**Some of our services
didn't restart gracefully.**

We always want to improve things.

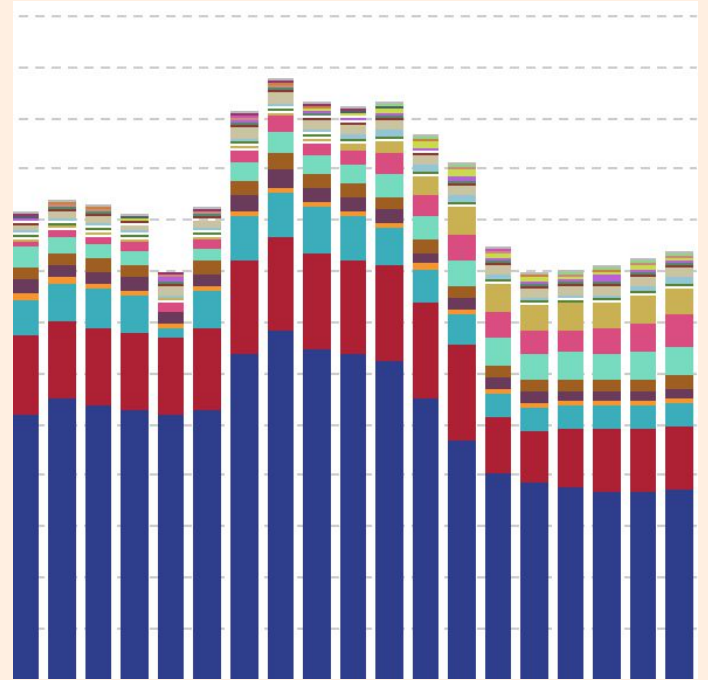
We had to get everyone involved.

**Feedback from our teams
was essential.**

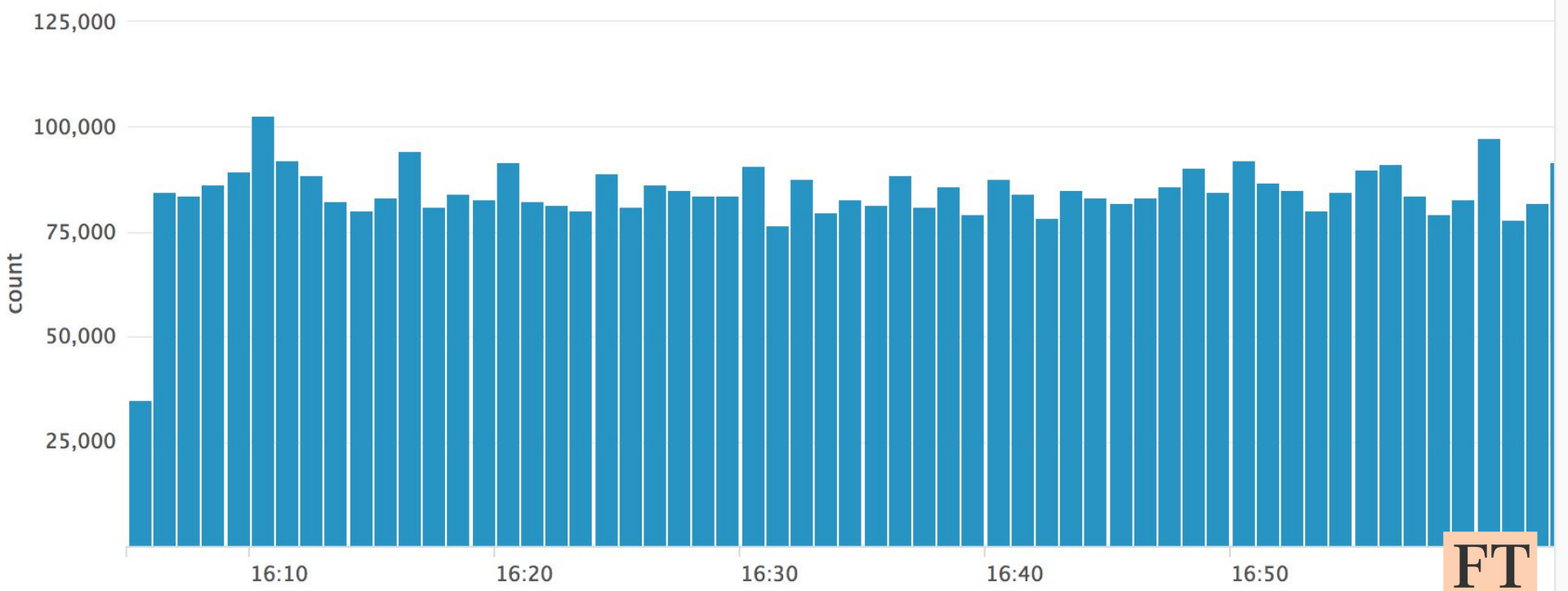
**We should have swarmed
on the work for longer.**

**Running in parallel increased
our release overheads.**

...and also increased
our AWS costs.



Column Chart Format Trellis





It's
never
"just"
containers

{ # LEAD
DEV }
LONDON



https://www.youtube.com/watch?v=sJx_emliABk

**Platform migration is a marathon,
not a sprint.**

**Don't underestimate the time
and resources required to
migrate to Kubernetes.**

Our iQuest colleagues were essential to making this successful.

Thank you, Tommy and Sorin. :)

2015

2016

2017

2018 > Kubernetes go-live.

Everything went smoothly.

Was it worth it?

We have a far more stable platform.

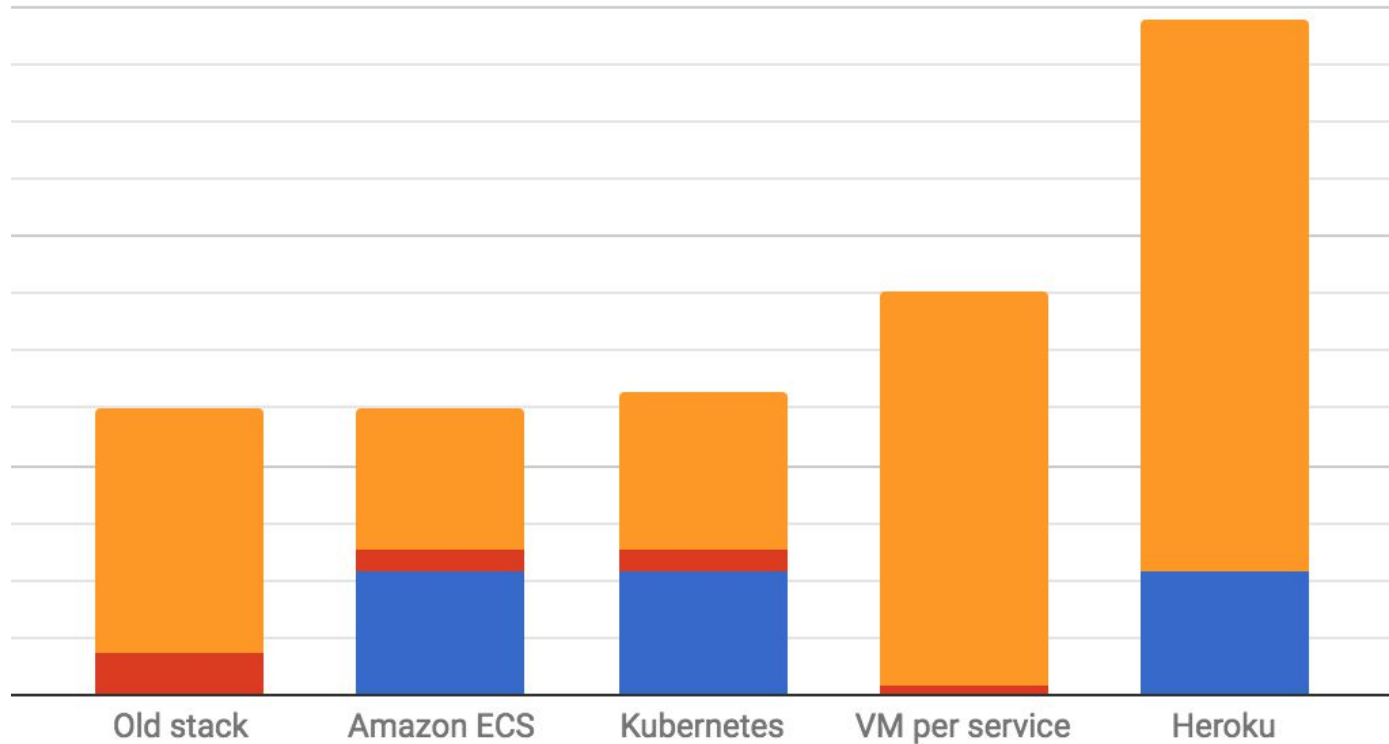
We have happier developers.

We can learn from others.

And we can share our knowledge.

3 Year Total Cost of Ownership

■ Hosting ■ Support ■ Migration



Nearly the end.

(don't clap yet)



@efinlay24

Sarah Wells

@sarahjwells



<https://www.youtube.com/watch?v=H06qrNmGqyE>

The end.

(please clap)

@efinlay24

euan.finlay@ft.com