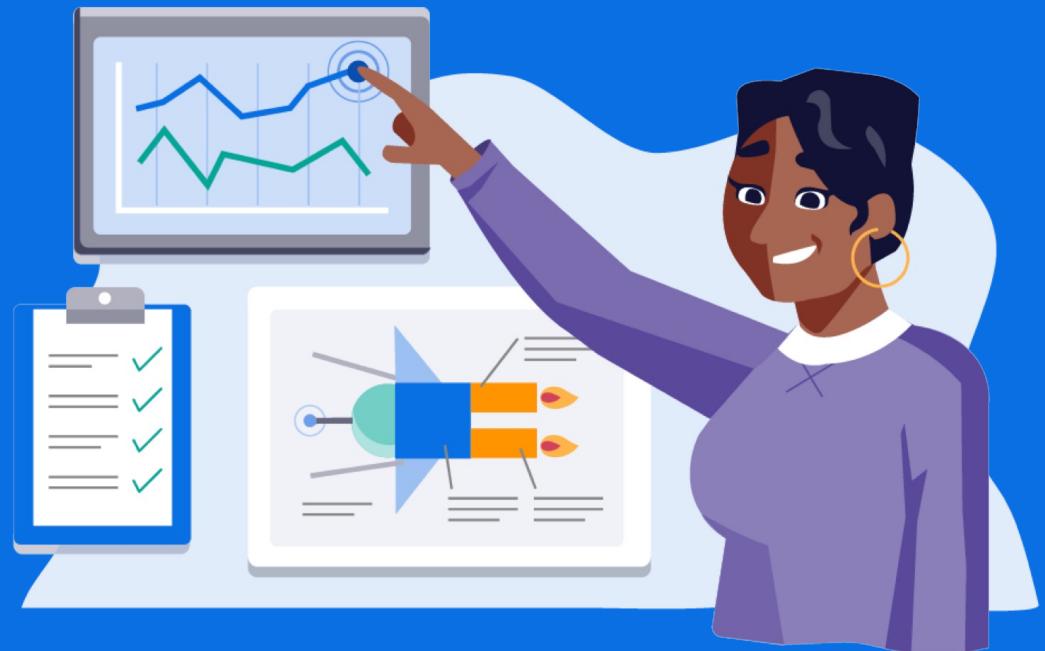
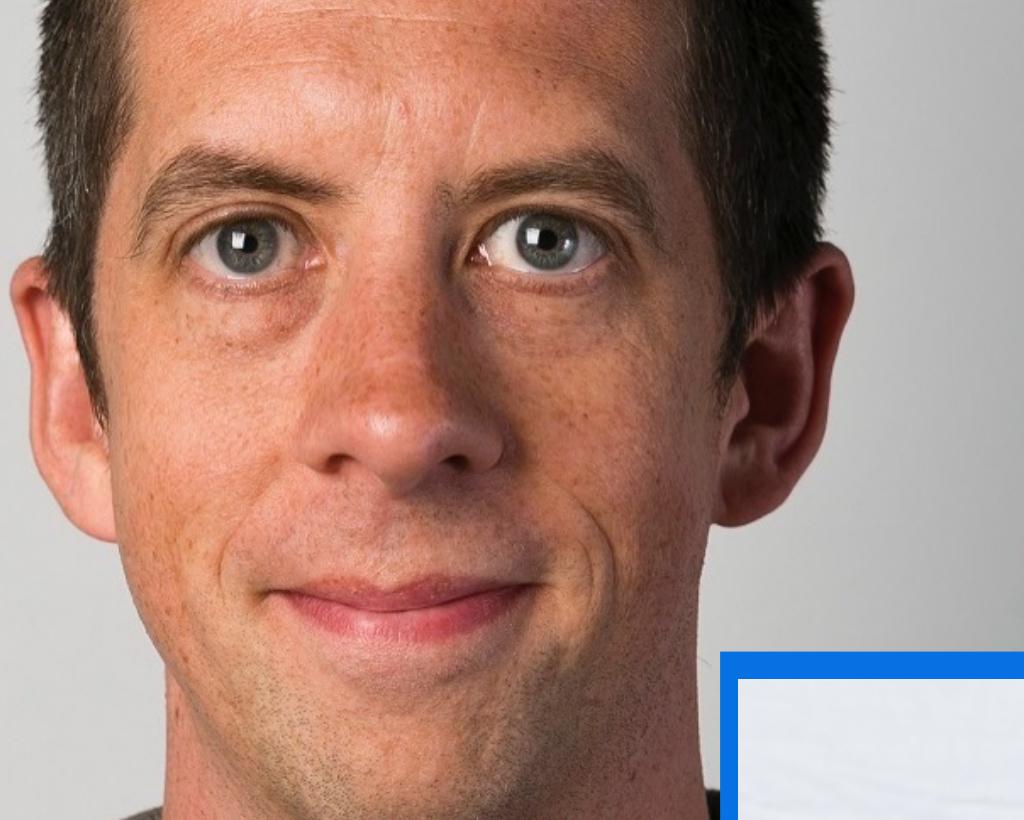


# How a Couple of Characters (and GitOps) Brought Down Our Site



Stuart Davidson (@spedge), Guy Templeton (@gitempleton)





Guy Templeton

Principal Software Engineer  
Co-chair SIG Autoscaling

Stuart Davidson

Director of Engineering at Skyscanner



 Flights Hotels Car Hire

# Let the journey begin

 Return  One way  Multi-city

From

Edinburgh (EDI)

To

Cork (ORK)

Depart

24/06/2022

Return

26/06/2022

Cabin Class &amp; Travellers

1 adult, Economy

 Add nearby airports Add nearby airports Direct flights only**Search flights →****Feedback**

## Watch every goal live

Search flights for the November matches in Qatar

Agenda

- 1. Skyscanner's Cloud Native journey**
- 2. What happened to Skyscanner**
- 3. What we (and you) can learn from it**



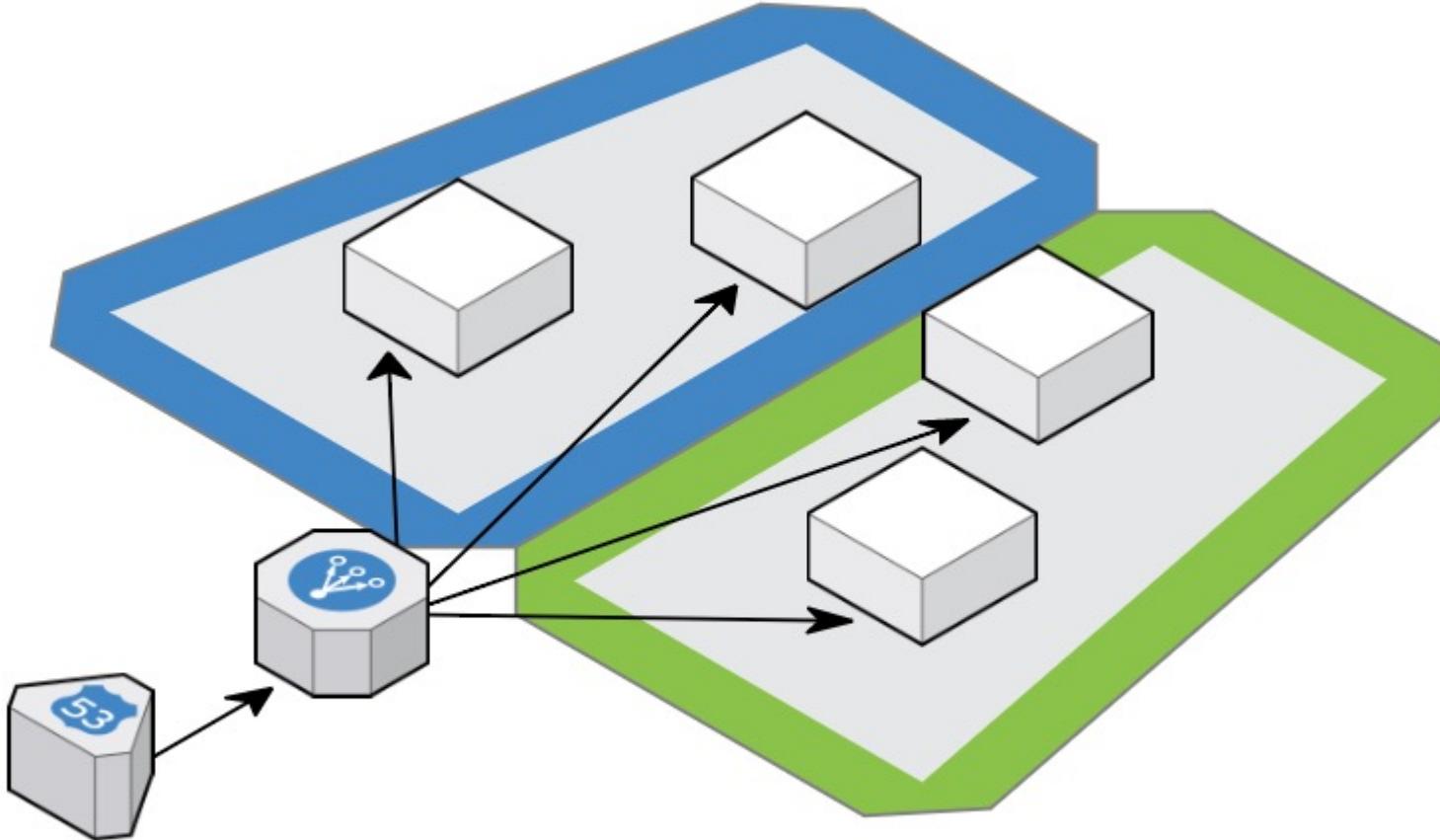
# Skyscanner's Cloud Native Journey



# Adopting Public Cloud

- Made the journey from DCs into public cloud
- At the same time, something called Docker was becoming "a thing"
- Evaluated options and built our own PaaS on ECS





Does it scale?



# **Seeing the Light**

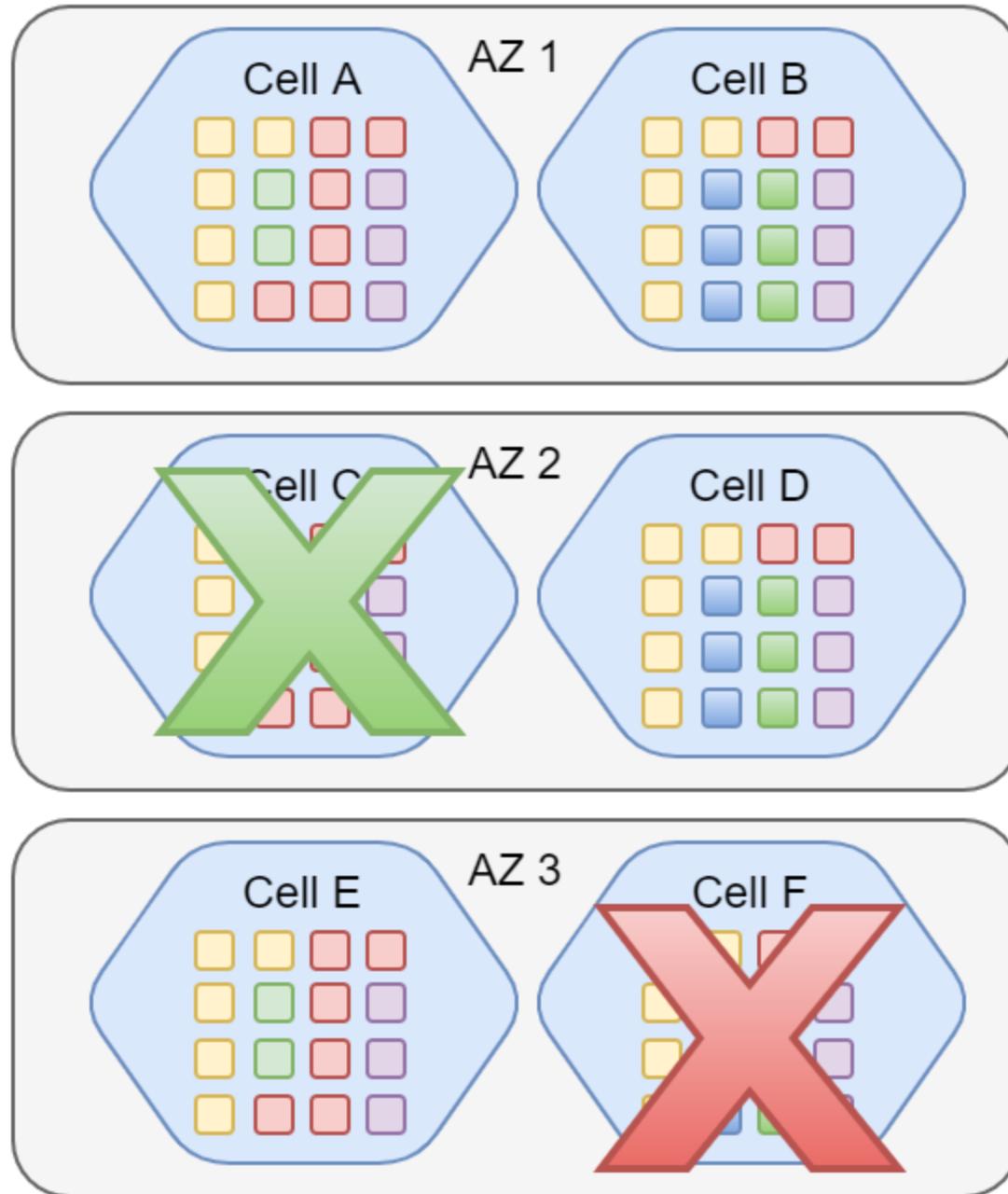
- Re-evaluated which technologies were providing developer value
- Move to the industry standards
- Open-source and Open Standards
- How do we get from here to there?



# Going All In on Cloud Native

- Growing number of clusters
- Adoption of more Cloud Native technologies (Istio, Helm, ArgoCD, etc, etc...)
- Moved to a cellular architecture for improved resilience...





K8S Cluster

Services



# What happened to Skyscanner?

# Pride cometh before a fall...

- 09:52:33 : Engineering All-Hands

Stuart Davidson : "*It's the traditional "Theory of Constraints" issue - you never fix a system, you just move the bottleneck but cells has absolutely fixed the issue of the availability of our compute...*"

- 15:53:01 : ArgoCD begins mass deletion of all services (478) in all namespaces across all AZs and Regions across the world **because we told it to...**



I'll just merge this  
no-op change...



## GitOops

```
37 -      cell: {{ default $cluster.name $cluster.unique_name }}
```

```
37 +      cell: $cluster.name
```



 Flights Hotels Car Hire

# Let the journey begin

Return  One way  Multi-city

From	To	Depart	Return	Cabin Class & Travellers
Glasgow (Any)	 Valencia (VLC)	17/05/2022	(One way)	1 adult, Economy ▾

Add nearby airports

Add nearby airports

Direct flights only

Search flights →



# We all need to get away sometimes...

Skyscanner is temporarily unavailable. We'll be back soon.





skyscanner.net



Apps



Enable Debug Info



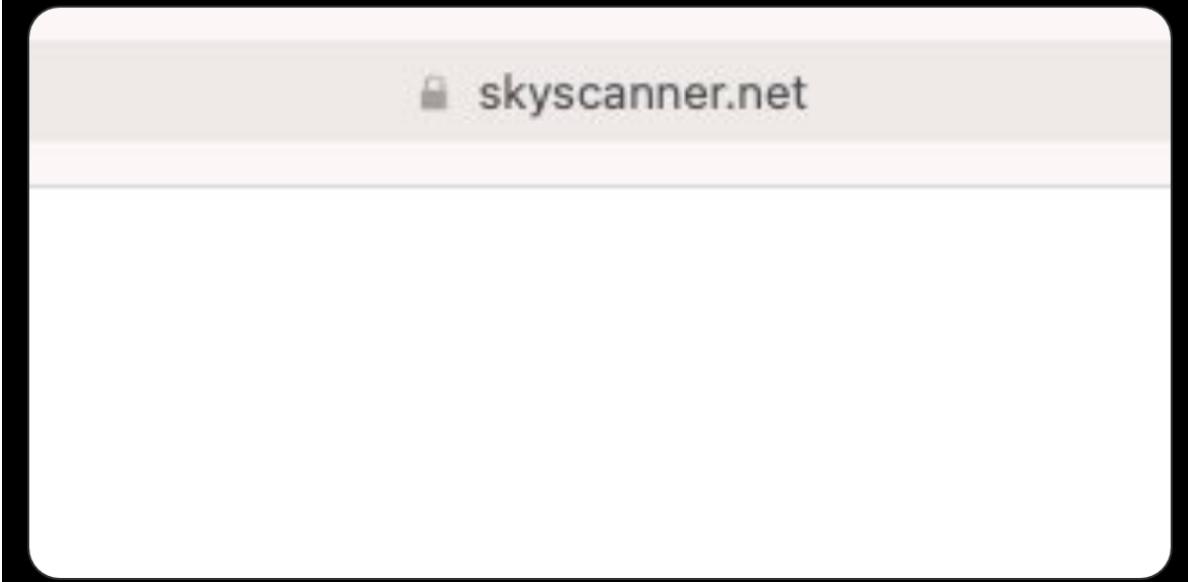
Spark SQL T

---

RBAC: access denied



@Skyscanner RBAC error on live site for users to see.  
Not good.



5:09 PM · Aug 25, 2021 · Twitter Web App

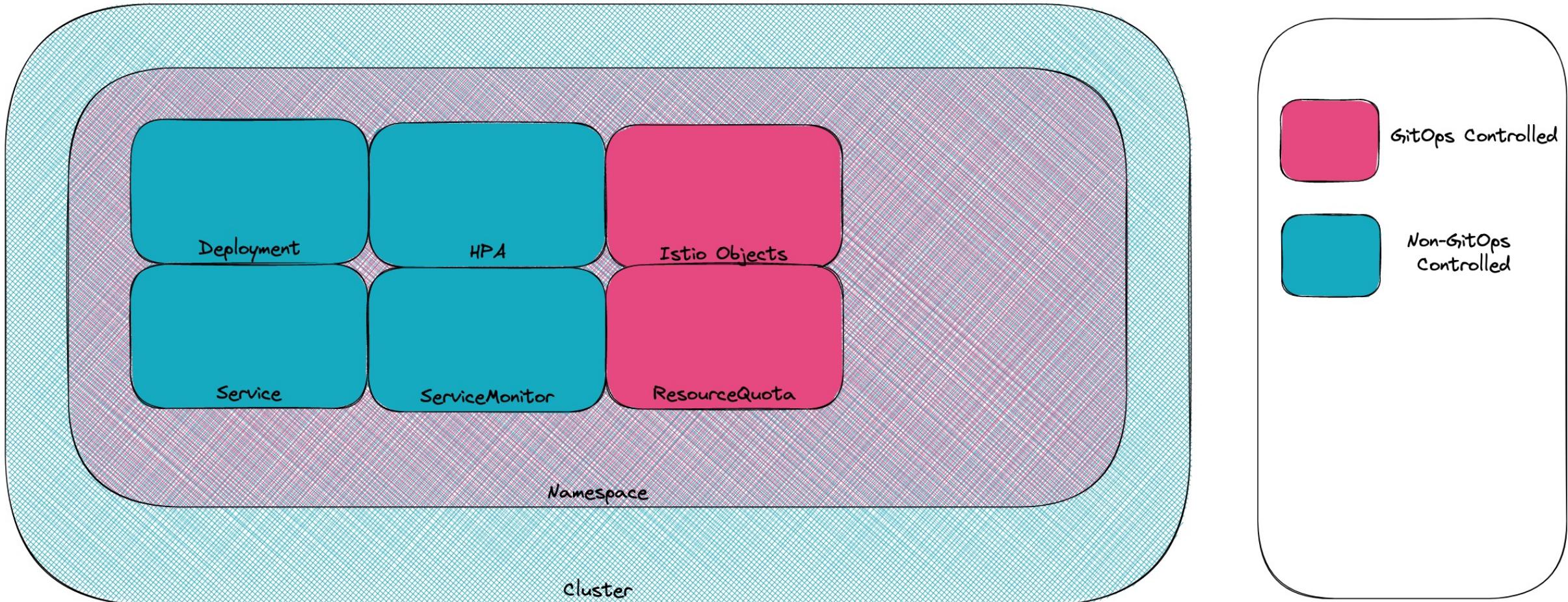
1 Like

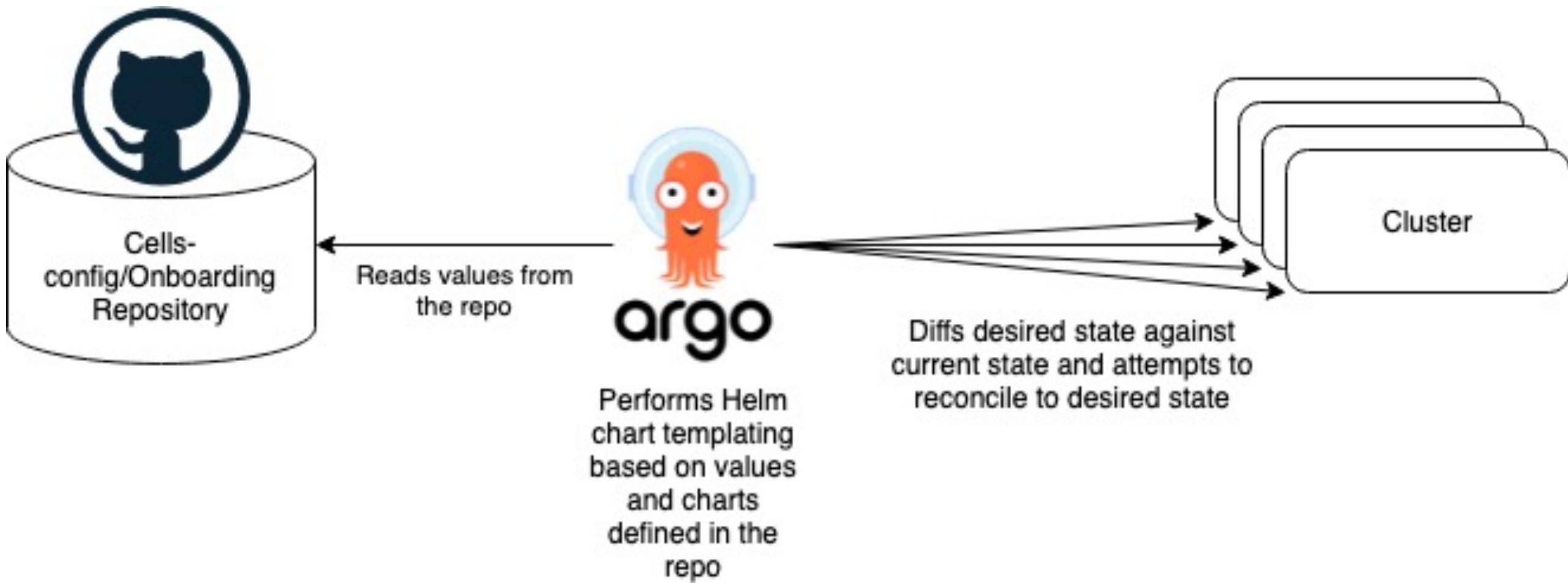


Tweet your reply

Reply







## GitOops

```
37 -      cell: {{ default $cluster.name $cluster.unique_name }}
```

```
37 +      cell: $cluster.name
```



# Recovery

- GitOps
- All of the rest...



# Recovery

- First, mitigate
- Prioritise getting a single region functional
- Shed non-critical load



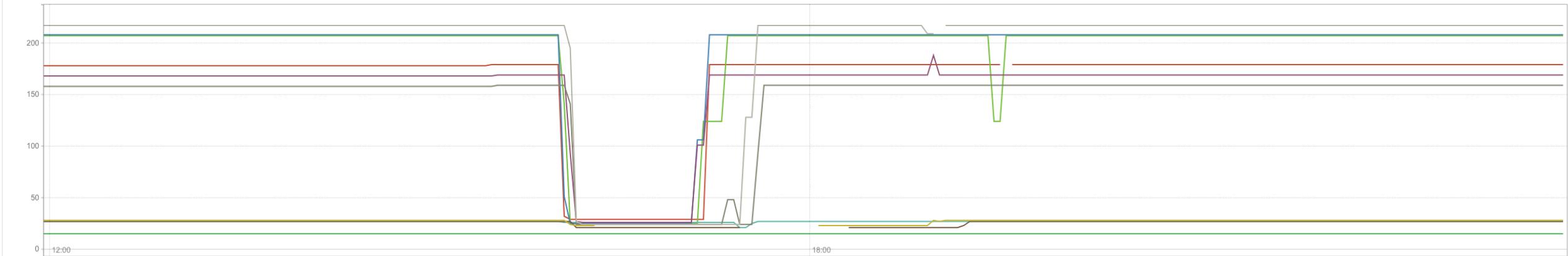
Enable query history

sum(count(kube\_namespace\_labels) by (cell)) by (cell)

 Execute- insert metric at cursor ·  deduplication partial responseLoad time: 560ms  
Resolution: 172s  
Total time series: 1

Graph

Console

 - 12h  +  2021-08-25 23:59  Res. (s)  stacked  Only raw data

- {cell="heritage-eu-west-1-1"}
- {cell="cells-1-eu-west-1c-3"}
- {cell="cells-1-eu-west-1c-2"}
- {cell="cells-1-eu-west-1c-1"}
- {cell="cells-1-eu-west-1b-3"}
- {cell="cells-1-eu-west-1b-2"}
- {cell="cells-1-eu-west-1b-1"}
- {cell="cells-1-eu-west-1a-3"}
- {cell="cells-1-eu-west-1a-2"}
- {cell="cells-1-eu-west-1a-1"}





# Recovery

- Manual recovery far, far tougher
- Dusty runbooks...

## Perform a restore

You should select backups from a similar time range for both clusters.

### Restore main cluster

We need to exec into the main etcd docker container running on the node and run the backup commands in the container. The following commands will achieve this.

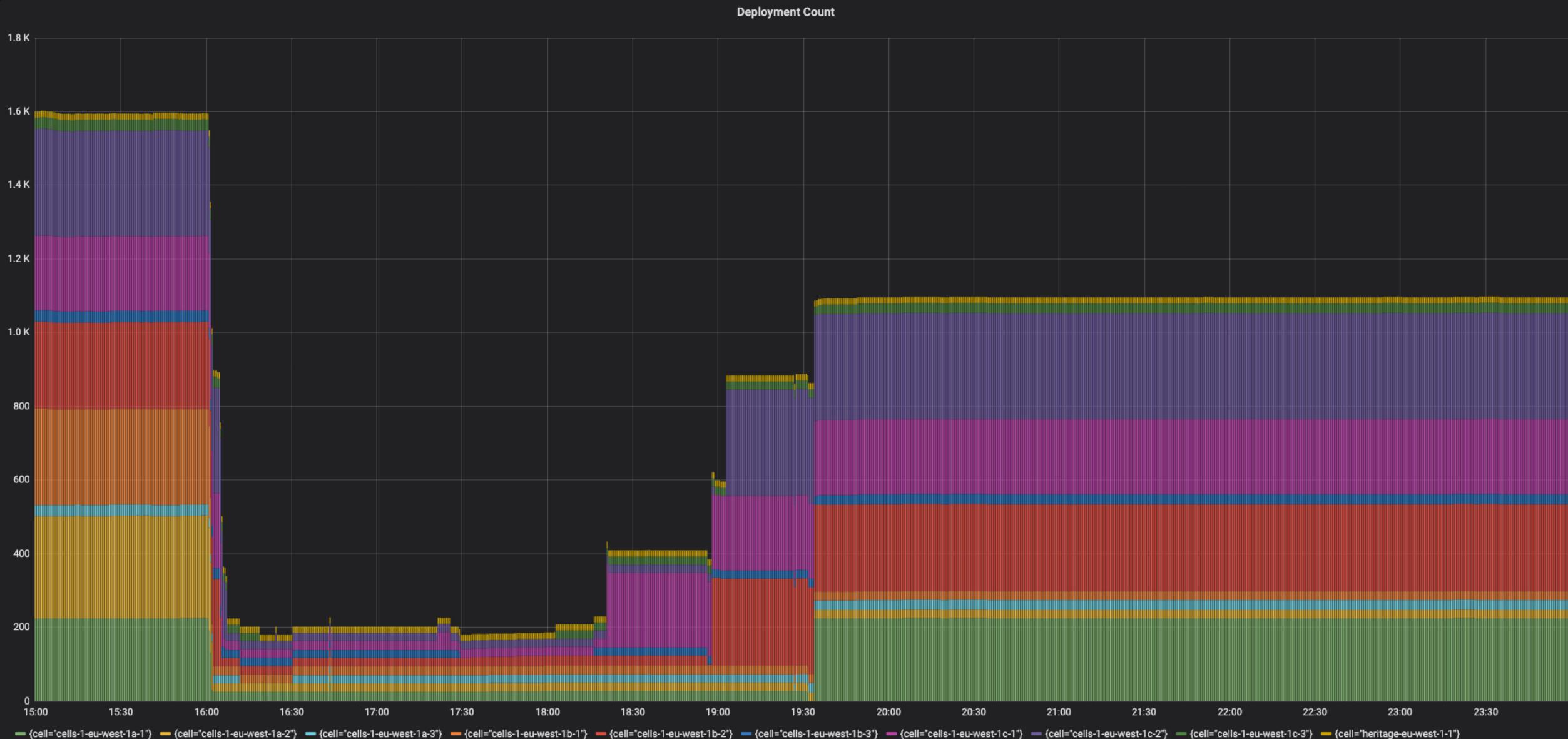
```
docker ps | grep etcd.*main
docker exec -u0 -it <id> bash
BACKUP_STORE_MAIN=$(ps -ef | grep etcd-manager | grep main | sed -e 's/.*/--backup-store=//;s/ .*/')
/etcd-manager-ctl --backup-store=${BACKUP_STORE_MAIN} list-backups
/etcd-manager-ctl --backup-store=${BACKUP_STORE_MAIN} restore-backup <backup>
```

### Restore events cluster

Restoring the events ETCd is very similar to restoring the main ETCd however you need to exec into a different pod and set a different backup store.

```
docker ps | grep etcd.*events
docker exec -u0 -it <id> bash
BACKUP_STORE_EVENTS=$(ps -ef | grep etcd-manager | grep events | sed -e 's/.*/--backup-store=//;s/ .*/')
/etcd-manager-ctl --backup-store=${BACKUP_STORE_EVENTS} list-backups
/etcd-manager-ctl --backup-store=${BACKUP_STORE_EVENTS} restore-backup <backup>
```





# What we (and you) can learn from it...

**The greatest risk  
comes whilst  
crossing the chasm**



**With great GitOps  
power, comes great  
responsibility**



# **Templates with logic are code**



# **Don't do global config deploys**



**A true blameless  
incident culture is  
invaluable**



“I’m frequently a cynic, but the positivity and calmness to give us the space to triage and recover from even an outage as catastrophic as this without any hint of blame was a real testament to Skyscanner’s culture.”

“I don’t think I’ve been as proud of anything during my time at Skyscanner as the full response on Wednesday night to get us back to serving travellers.”

# Thanks!

# Further Reading:

- <https://medium.com/@SkyscannerEng/how-a-couple-of-characters-brought-down-our-site-356ccaf1fbc3>
- <https://medium.com/@SkyscannerEng/our-essential-developer-enablement-tools-for-software-engineers-1e61d3751e46>

