### **Don't Panic!**

How to Cope Now You're Responsible for Production

Euan Finlay @efinlay24

















### ECB leaves rates unchanged in shock decision on.ft.com/1Nrekqz











On Thursday we published an incorrect story on FT.com that stated the European Central Bank had confounded expectations by deciding to hold interest rates rather than cut them. The story was published a few minutes before the decision to cut rates was announced.

The story was wrong and should not have been published. The article was one of two pre-written stories — covering different possible decisions — which had been prepared in advance of the announcement. Due to an editing error it was published when it should not have been. Automated feeds meant that the initial error was compounded by being simultaneously published on Twitter.

The FT deeply regrets this serious mistake and will immediately be reviewing its publication and workflow processes to ensure such an error cannot happen again. We apologise to all our readers.





#### /usr/bin/whoami



#### /usr/bin/whodoiworkfor

No such file or directory.



#### FINANCIAL TIMES



HOME WORLD UK COMPANIES TECH MARKETS GRAPHICS OPINION WORK & CAREERS LIFE & ARTS HOW TO SPEND IT

Portfolio Account Settings

**Companies House UK** 

#### UK plans biggest overhaul of Companies House in 170 years

Corporate register to be given greater powers after proving easy prey for criminals

- · Fewer dark corners for dirty money to hide in
- Lead shareholders remain hidden despite transparency rules
- Campaigner prosecuted over stunt to expose UK company records fraud



**Brexit** 

Is Brexit impasse turning Britain into Belgium?



#### **UK politics & policy** DUP win biggest share of Northern Ireland vote

Local election result is boost for Arlene Foster's hard line on Brexit



**European Union** ThyssenKrupp-Tata merger at risk of being blocked

Regulator believes deal lead to less choice and higher steel prices



**Ford Motor Co** Ford relocates expat executives from China arm

Locals hired instead as sales plunge in world's biggest car market



North Korea nuclear tensions Pyongyang confirms weapons tests as nuclear talks stall

Move ratchets up tensions with US but Trump insists denuclearisation deal 'will happen'



#### Your team is now on call.

And you're mildly terrified.



#### Obligatory audience interaction.



## Everyone feels the same when they start out.

I still do today.



# How do you get comfortable with supporting production?





> Future



#### **Future**

> Present



Future Present

> Past





# Handling incidents is the same as any other skill.



### Get comfortable with your alerts.



# Delete the alerts you don't care about.



### Have a plan for when things break.



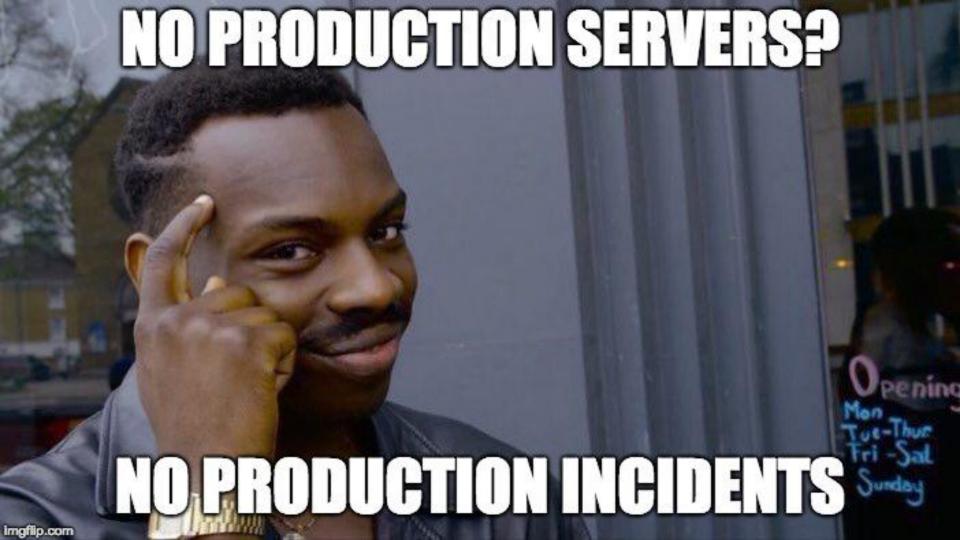
### Keep the documentation up to date.



### Practice regularly.



### "The Gang Deletes Production"



### Break things, and see what happens.

Did your systems do what you expected?





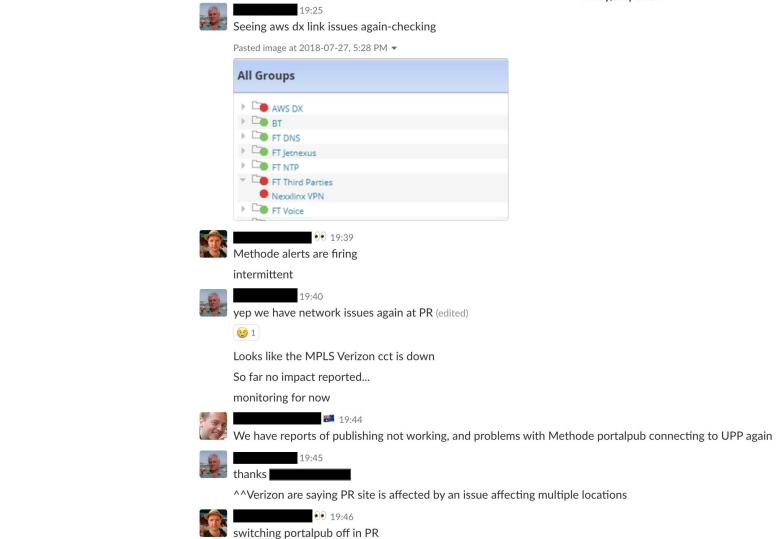
## We got complacent, and stopped running datacenter failure tests...



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# Have a central place for reporting changes and problems.





#### We're not perfect.

But we always try to improve.



**Future** 

> Present

**Past** 





## Calm down, and take a deep breath.

It's probably ok.



## Don't dive straight in.

Go back to first principles.

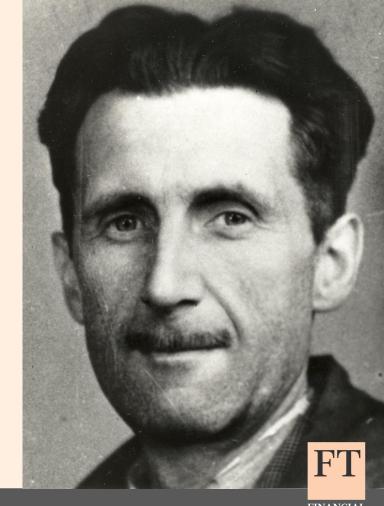


## What's the actual impact?



"All incidents are equal, but some incidents are more equal than others."

George Orwell, probably.



## What's already been tried?





## Is there definitely a problem?



DONT PANIC DON'T EVERYTHING PROBABLY WORRY OK FINE

### What's the minimum viable solution?



## Get it running <u>before</u> you get it fixed.



### Go back to basics.



It's not DNS
There's no way it's DNS
It was DNS

-SSBroski







## Don't be afraid to call for help.









## Communication is key.

Especially to our customers.





## Put someone in charge.





(Incident #4073269)

Pingdom APP 14:42

upp-prod-delivery-us.ft.com • View details

k8s - UPP Prod Delivery US: Annotations Read Aggregate Healthcheck is down

- k8s UPP Prod Delivery UK: Annotations Read Aggregate Healthcheck is down (Incident #4073041)
- - upp-prod-delivery-eu.ft.com View details
  - k8s UPP Prod Delivery UK: Content Read Aggregate Healthcheck is down (Incident #4073077)
  - upp-prod-delivery-eu.ft.com View details
  - k8s UPP Prod Delivery US: Content Publish Aggregate Healthcheck is down
  - (Incident #4073290) upp-prod-delivery-us.ft.com • View details
- - k8s UPP Prod Delivery US: Annotations Read Aggregate Healthcheck is up (Incident #4073269) upp-prod-delivery-us.ft.com • View details
  - k8s UPP Prod Delivery US: Image Publish Aggregate Healthcheck is down (Incident #4073407)

  - - upp-prod-delivery-us.ft.com View details
    - k8s UPP Prod Delivery UK: Image Publish Aggregate Healthcheck is down
    - upp-prod-delivery-eu.ft.com View details

Software can be chaotic, but we make it work



## Trying Stuff Until it Works

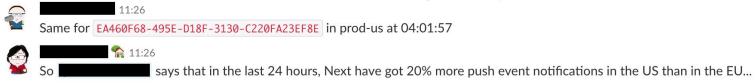
O RLY?

The Practical Developer

@ThePracticalDev

## Create a temporary incident channel.





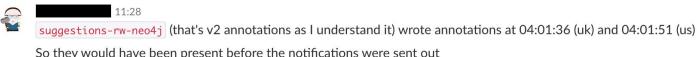


Both request times line up exactly with the notification timestamps

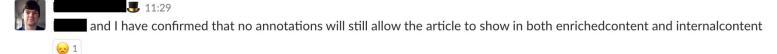




green is US region



So they would have been present before the notifications were sent out



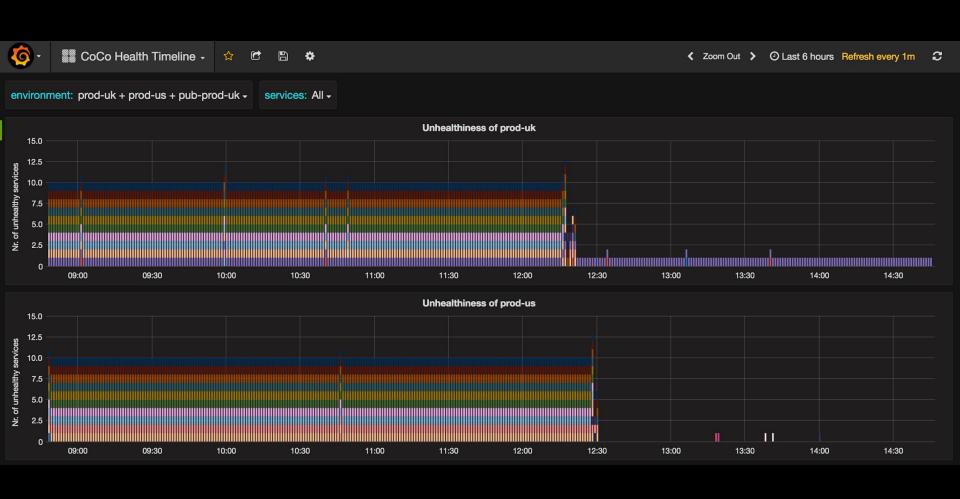
Hmm, that's a big gap between 1 and 5

# If you think you're over-communicating, it's probably just the right amount.



## Tired people don't think good.





## "The Gang Serves Traffic

## From Staging"

Type: HTTP

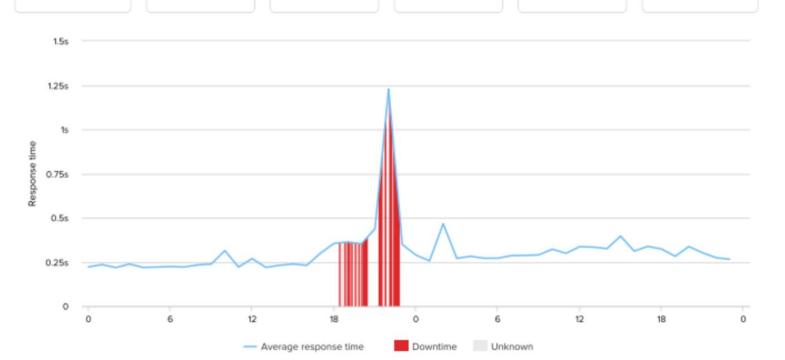
#### Response time

Downtime 1h51m Outages 21 Uptime 96.15%

Max resp. time 1.23s

Min resp. time 218ms

Avg resp. time 302ms



## It wasn't great, but it wasn't the end of the world.



### The Ghosts of Incidents...

Future Present

> Past





## Congratulations! We survived.

It probably wasn't that bad, was it?



## Run a learning review with everyone involved.



## Incident reports are important.



NEVER HAVE I FELT SO CLOSE TO ANOTHER SOUL AND YET SO HELPLESSLY ALONE

AS WHEN I GOOGLE AN ERROR

A THREAD BY SOMEONE

WITH THE SAME PROBLEM

AND NO ANSWER

LAST POSTED TO IN 2003



#### Postmortem of database outage of January 31

Postmortem on the database outage of January 31 2017 with the lessons we learned.

← Back to company

On January 31st 2017, we experienced a major service outage for one of our products, the online service GitLab.com. The outage was caused by an accidental removal of data from our primary database server.

This incident caused the GitLab.com service to be unavailable for many hours. We also lost some production data that we were eventually unable to recover. Specifically, we lost modifications to database data such as projects, comments, user accounts, issues and snippets, that took place between 17:20 and 00:00 UTC on January 31. Our best estimate is that it affected roughly 5,000 projects, 5,000 comments and 700 new user accounts. Code repositories or wikis hosted on GitLab.com were unavailable during the outage, but were not affected by the data loss. GitLab Enterprise customers, GitHost customers, and self-hosted GitLab CE users were not affected by the outage, or the data loss.





"Until a restore is attempted, a backup is both successful and unsuccessful."

Erwin Schrödinger?



#### **Timeline**

On January 31st an engineer started setting up multiple PostgreSQL servers in our staging environment. The plan was to try out pgpool-II to see if it would reduce the load on our database by load balancing queries between the available hosts. Here is the issue for that plan: infrastructure#259.

± 17:20 UTC: prior to starting this work, our engineer took an LVM snapshot of the production database and loaded this into the staging environment. This was necessary to ensure the staging database was up to date, allowing for more accurate load testing. This procedure normally happens automatically once every 24 hours (at 01:00 UTC), but they wanted a more up to date copy of the database.

**± 19:00 UTC:** GitLab.com starts experiencing an increase in database load due to what we suspect was spam. In the week leading up to this event GitLab.com had been experiencing similar problems, but not this severe. One of the problems this load caused was that many users were not able to post comments on issues and merge requests. Getting the load under control took several hours.

We would later find out that part of the load was caused by a background job trying to remove a GitLab employee and their associated data. This was the result of their account being flagged for abuse and accidentally scheduled for removal. More information regarding this particular problem can be found in the issue "Removal of users by spam should not hard delete".



#### **Publication of the outage**

In the spirit of transparency we kept track of progress and notes in a publicly visible Google document. We also streamed the recovery procedure on YouTube, with a peak viewer count of around 5000 (resulting in the stream being the #2 live stream on YouTube for several hours). The stream was used to give our users live updates about the recovery procedure. Finally we used Twitter (https://twitter.com/gitlabstatus) to inform those that might not be watching the stream.

The document in question was initially private to GitLab employees and contained name of the engineer who accidentally removed the data. While the name was added by the engineer themselves (and they had no problem with this being public), we will redact names in future cases as other engineers may not be comfortable with their name being published.

#### Data loss impact

Database data such as projects, issues, snippets, etc. created between January 31st 17:20 UTC and 23:30 UTC has been lost. Git repositories and Wikis were not removed as they are stored separately.

It's hard to estimate how much data has been lost exactly, but we estimate we have lost at least 5000 projects, 5000 comments, and roughly 700 users. This only affected users of GitLab.com, self-hosted instances or GitHost instances were not affected.



## Identify what can be improved for next time.



#### Improving recovery procedures

We are currently working on fixing and improving our various recovery procedures. Work is split across the following issues:

- 1. Overview of status of all issues listed in this blog post (#1684)
- 2. Update PS1 across all hosts to more clearly differentiate between hosts and environments (#1094)
- 3. Prometheus monitoring for backups (#1095)
- 4. Set PostgreSQL's max\_connections to a sane value (#1096)
- 5. Investigate Point in time recovery & continuous archiving for PostgreSQL (#1097)
- 6. Hourly LVM snapshots of the production databases (#1098)
- 7. Azure disk snapshots of production databases (#1099)
- 8. Move staging to the ARM environment (#1100)
- 9. Recover production replica(s) (#1101)
- 10. Automated testing of recovering PostgreSQL database backups (#1102)
- 11. Improve PostgreSQL replication documentation/runbooks (#1103)
- 12. Investigate pgbarman for creating PostgreSQL backups (#1105)
- 13. Investigate using WAL-E as a means of Database Backup and Realtime Replication (#494)
- 14. Build Streaming Database Restore
- 15. Assign an owner for data durability



## Nearly the end.

Don't clap yet.



### Failure is inevitable.

And that's ok.



### The end.

"Please clap."
Jeb Bush, 2016



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