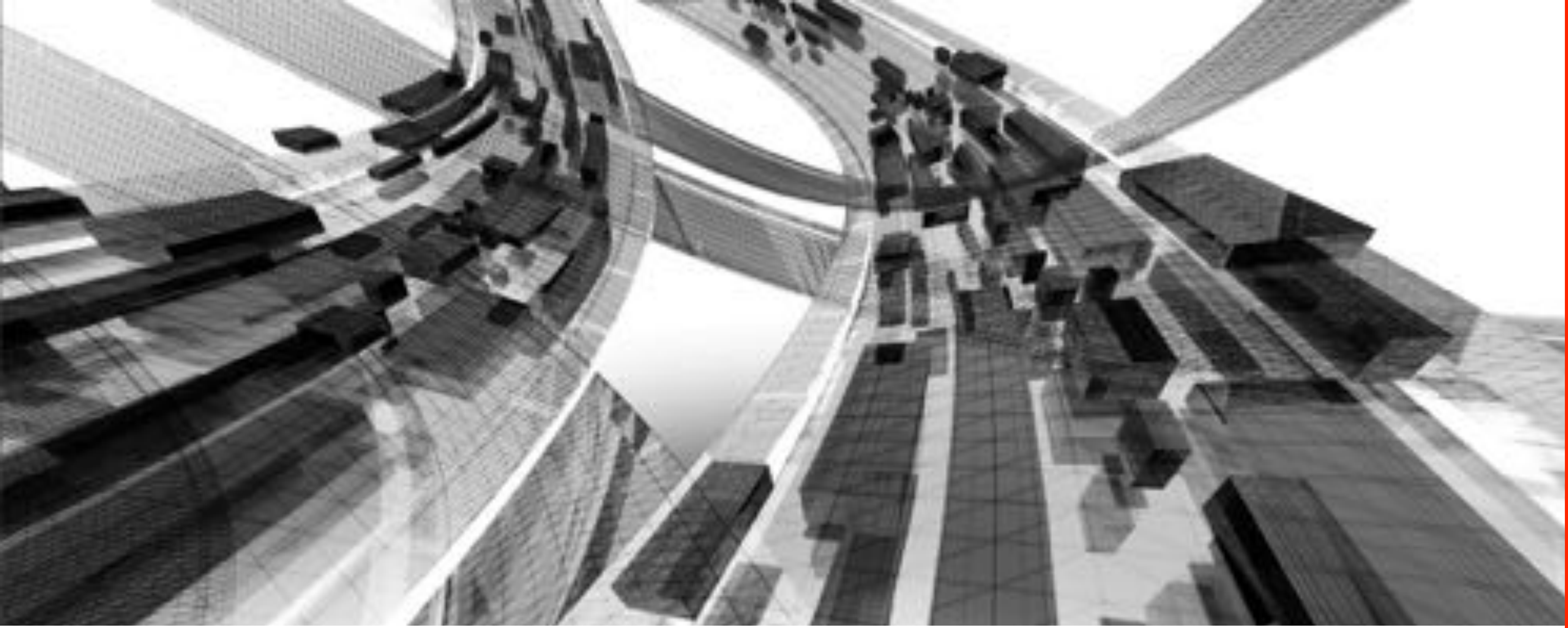

Managing Large Mission Critical Coherence Clusters

Philip Miller

7th November 2014

HSBC

PUBLIC

Agenda

- What is Mission Critical
- What is a Large Cluster
- The Challenges
- Some Solutions

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What is Mission Critical

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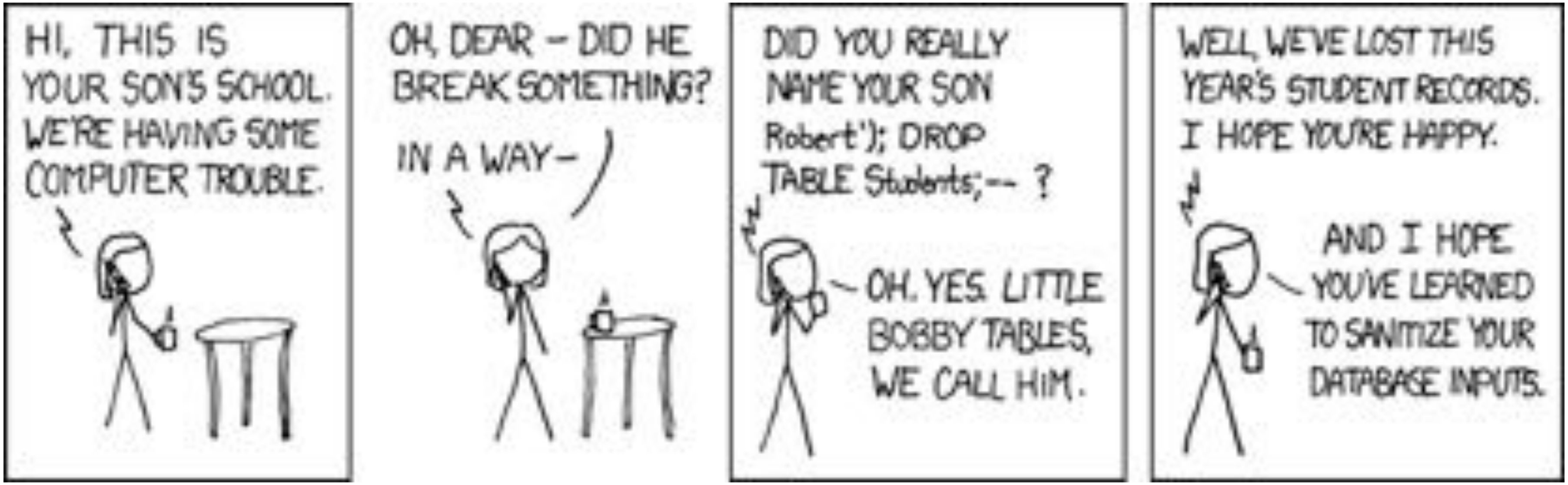
HI, THIS IS YOUR SON'S SCHOOL. WE'RE HAVING SOME COMPUTER TROUBLE.
OH, DEAR – DID HE BREAK SOMETHING?
IN A WAY–
DID YOU REALLY NAME YOUR SON Robert'); DROP TABLE Students;-- ?
OH. YES. LITTLE BOBBY TABLES, WE CALL HIM.
WELL, WE'VE LOST THIS YEAR'S STUDENT RECORDS. I HOPE YOU'RE HAPPY.
AND I HOPE YOU'VE LEARNED TO SANITIZE YOUR DATABASE INPUTS.

What is Mission Critical

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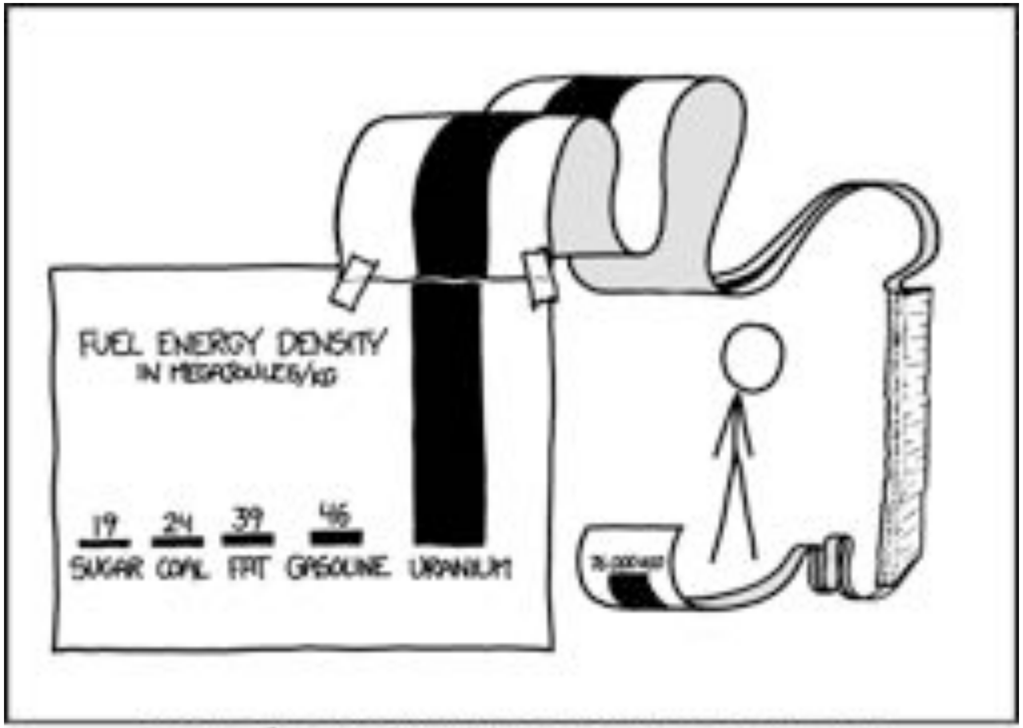
- There are a number of reasons why an application could be classed as Mission Critical
  - A large number of people use it and without it they cannot do their jobs
  - The loss of the system will cause the company financial or reputational damage
  - The business say so
- This brings a number of challenges
  - Coherence solves a lot as it is highly redundant and can survive serious problems
- Complicating Requirements
  - No data loss
  - Always available
  - Rapidly evolving capability

What is a Large Cluster



SCIENCE TIP: LOG SCALES ARE FOR QUITTERS WHO CAN'T FIND ENOUGH PAPER TO MAKE THEIR POINT PROPERLY.

What is a Large Cluster

- Large can be measured in several ways
  - Number of processors
  - Amount of memory
  - Number of services
  - Number of caches
  - Number of Computers
  - Amount of network consumed
  - Number of sites
  - Frequency of things to do

- Today
  - 48 Computers, 6TB of RAM, 2 Sites, 180 million things to do and persist per day

- Tomorrow
  - 120+ Computers, 18TB of RAM, 3 Sites, 500 million things to do and persist per day

The Challenges

Insert GPS number here

NEVER HAVE I FELT SO CLOSE TO ANOTHER SOUL
AND YET SO HELPLESSLY ALONE
AS WHEN I GOOGLE AN ERROR
AND THERE'S ONE RESULT
A THREAD BY SOMEONE WITH THE SAME PROBLEM
AND NO ANSWER
LAST POSTED TO IN 2003
WHO WERE YOU, DENVERCODER9?
WHAT DID YOU SEE?!

The Challenges
Breaking New Ground

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- Test Data is really hard to source
  - It is important to invest in testing – this seems obvious but it is hard to get the time from the customer and it is always squeezed
- How do you test at scale?
  - Simulating a business is really hard
- How do you test real failures?
  - Fire drills, assume that it will go wrong some day and hope that it does not
  - Remember entropy – prove your system again and again

The Challenges
Monitoring – There is a lot going on

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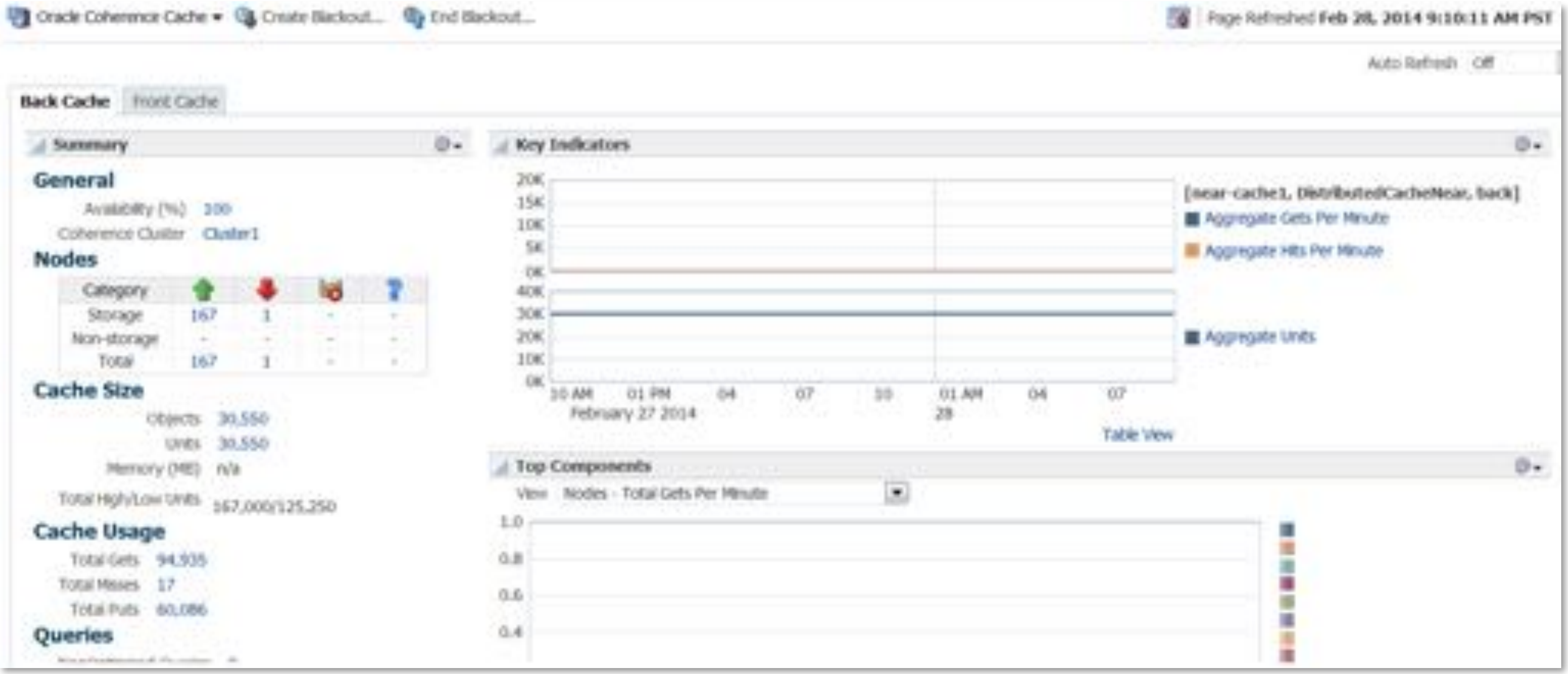


Oracle Coherence Cache ▾ Create Blackout... End Blackout... Page Refreshed **Feb 28, 2014 9:10:11 AM PST**

Auto Refresh Off

Back Cache Front Cache

Summary

General

Availability (%) 100

Coherence Cluster Cluster1

Nodes

Category	↑	↓	▨	?
Storage	167	1	-	-
Non-storage	-	-	-	-
Total	167	1	-	-

Cache Size

Objects 30,550

Units 30,550

Memory (MB) n/a

Total High/Low Units 167,000/125,250

Cache Usage

Total Gets 94,935

Total Misses 17

Total Puts 60,086

Queries

Key Indicators

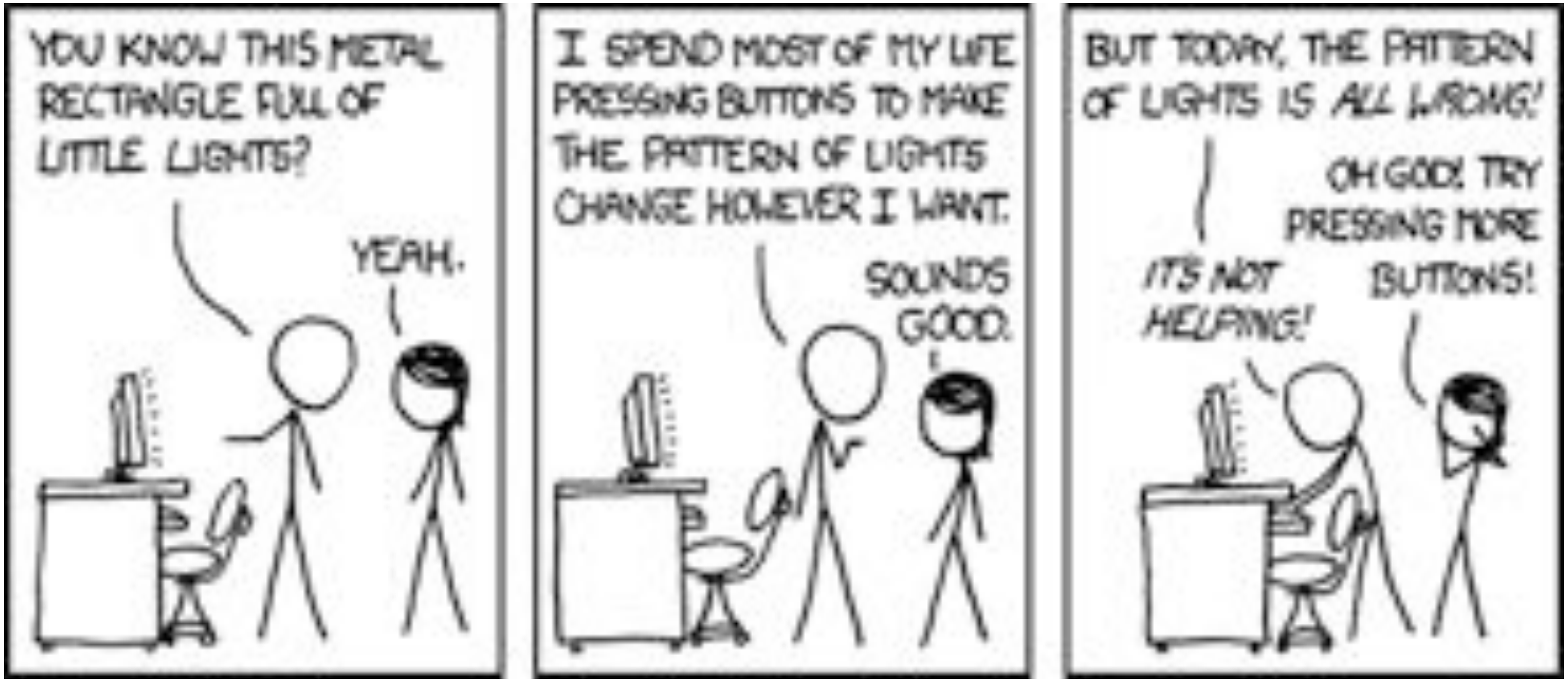
20K
15K
10K
5K
0K
40K
30K
20K
10K
0K
10 AM
01 PM
04
07
10
01 AM
04
07
February 27 2014
28
[near-cache1, DistributedCacheNear, back]
■ Aggregate Gets Per Minute
■ Aggregate Hits Per Minute
■ Aggregate Units

Table View

Top Components

View Nodes - Total Gets Per Minute ▾

Some Solutions

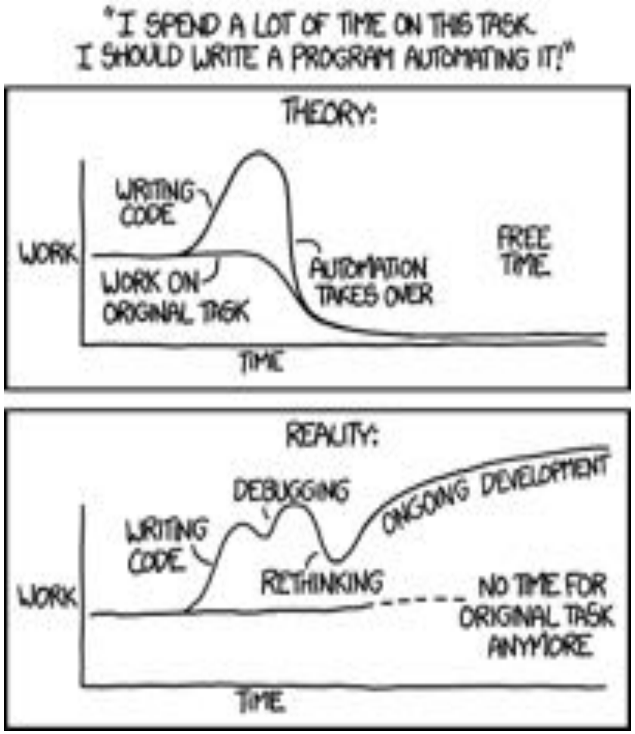

YOU KNOW THIS METAL RECTANGLE FULL OF LITTLE LIGHTS?
YEAH.
I SPEND MOST OF MY LIFE PRESSING BUTTONS TO MAKE THE PATTERN OF LIGHTS CHANGE HOWEVER I WANT.
SOUNDS GOOD.
BUT TODAY, THE PATTERN OF LIGHTS IS ALL WRONG!
OH GOD! TRY PRESSING MORE BUTTONS!
IT'S NOT HELPING!

Some Solutions
Investing in Automation

- Seeding environments with the correct data and being able to simulate real-life is important
  - We have 200 upstream providers of data
  - We have 150 deliveries of code each week from outside of the core team
  - We have 90 different type of output data to many consumers

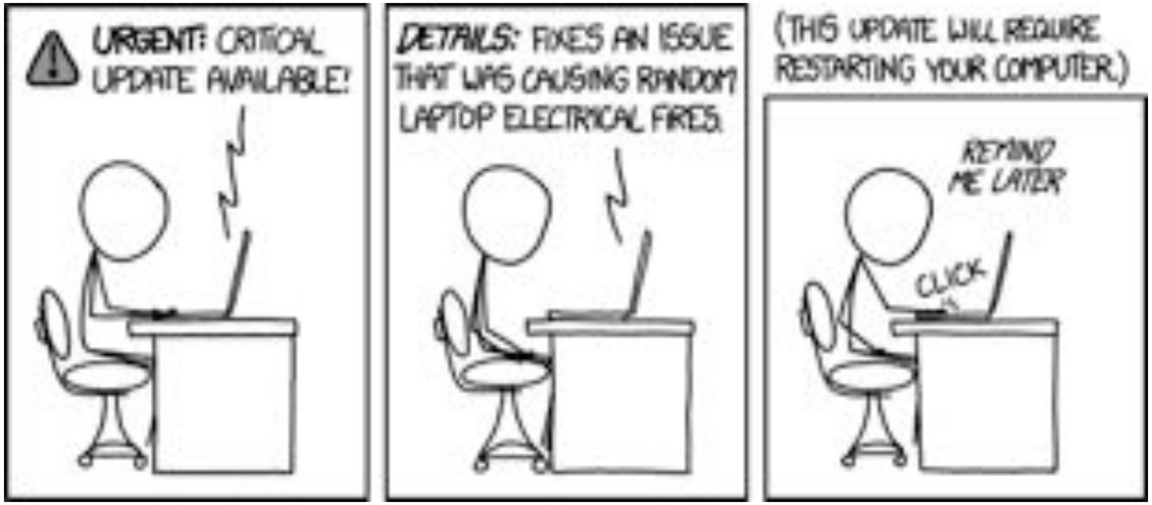
- Automate where you can
  - Unit tests
  - Integration Tests
  - User Acceptance Tests
  - Destructive Tests

- Always have an escape plan
  - Minimal Effort of Rollback change
  - Minimal Effort if there is a problem



Some Solutions
Investing in Tools

- Don’t over complicate
  - Actually the less people knowing they are using Coherence the better!
  - Abstract with APIs
- Can you predict the effect of change?
  - When do you upgrade?
  - Bug fixing cannot wait!
- No excuses
  - Monitoring
  - Eye-balling
  - Trends


URGENT: CRITICAL UPDATE AVAILABLE!
DETAILS: FIXES AN ISSUE THAT WAS CAUSING RANDOM LAPTOP ELECTRICAL FIRES.
(THIS UPDATE WILL REQUIRE RESTARTING YOUR COMPUTER.)
REMIND ME LATER
CLICK

Some Solutions
Investing in People

Insert GPS number here

- Know Your Solution
  - Do you understand how Coherence works?
  - Do you understand how your system works?
    - “What ifs” covered?
    - Listen to your team
- Some things can only be tested in Production
  - You need to think of every eventuality
  - This subject needs to be treated carefully
- Production Support
  - Segregation of Duties
  - Nothing is cheap when it is this size
- You need a good customer!
- Let Others Know about your App
  - Operations Staff
  - Oracle!

Any Questions

- And thanks + acknowledgements to XKCD for helping me write this presentation!

Go to the Tower of London while you are in the City