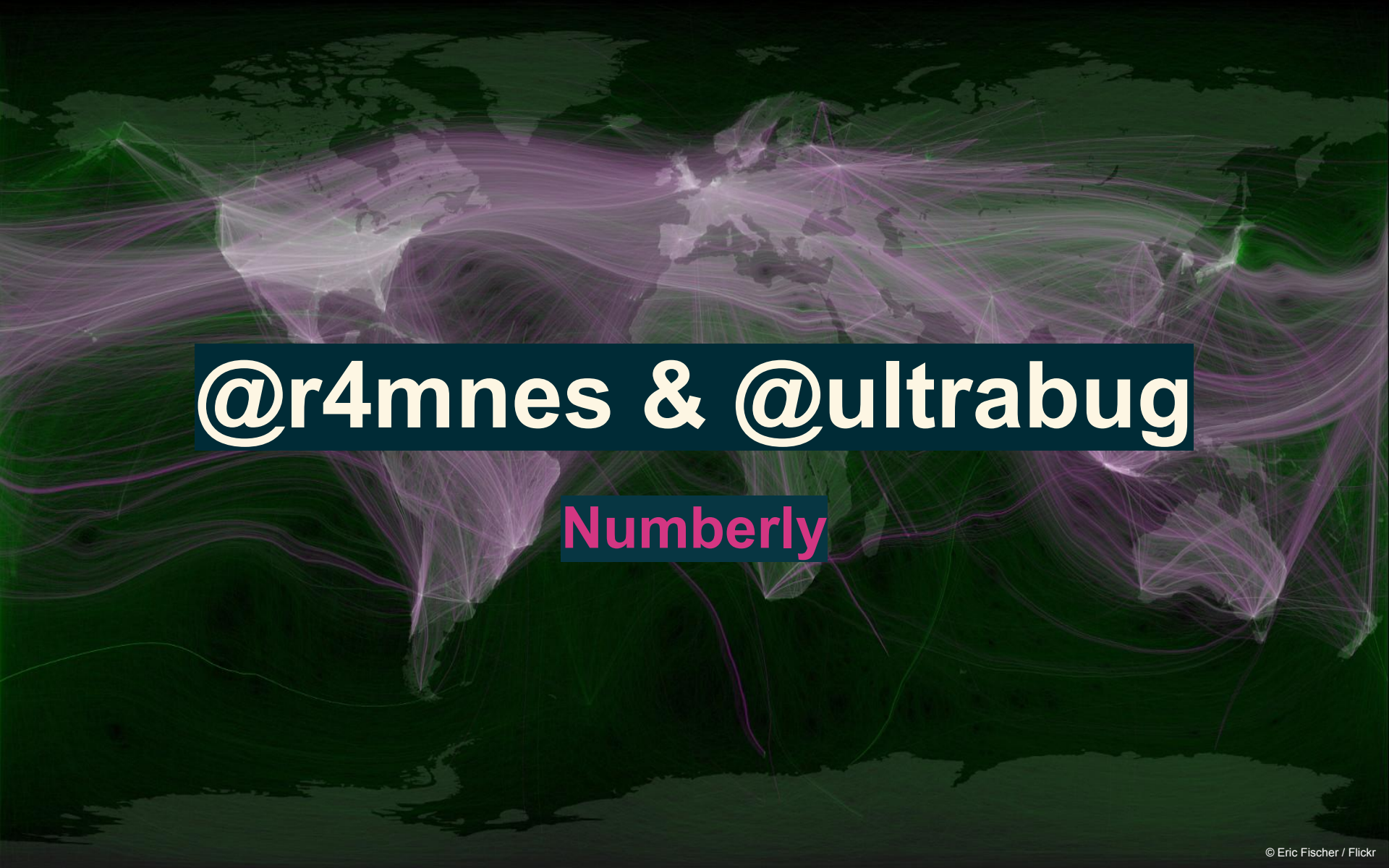
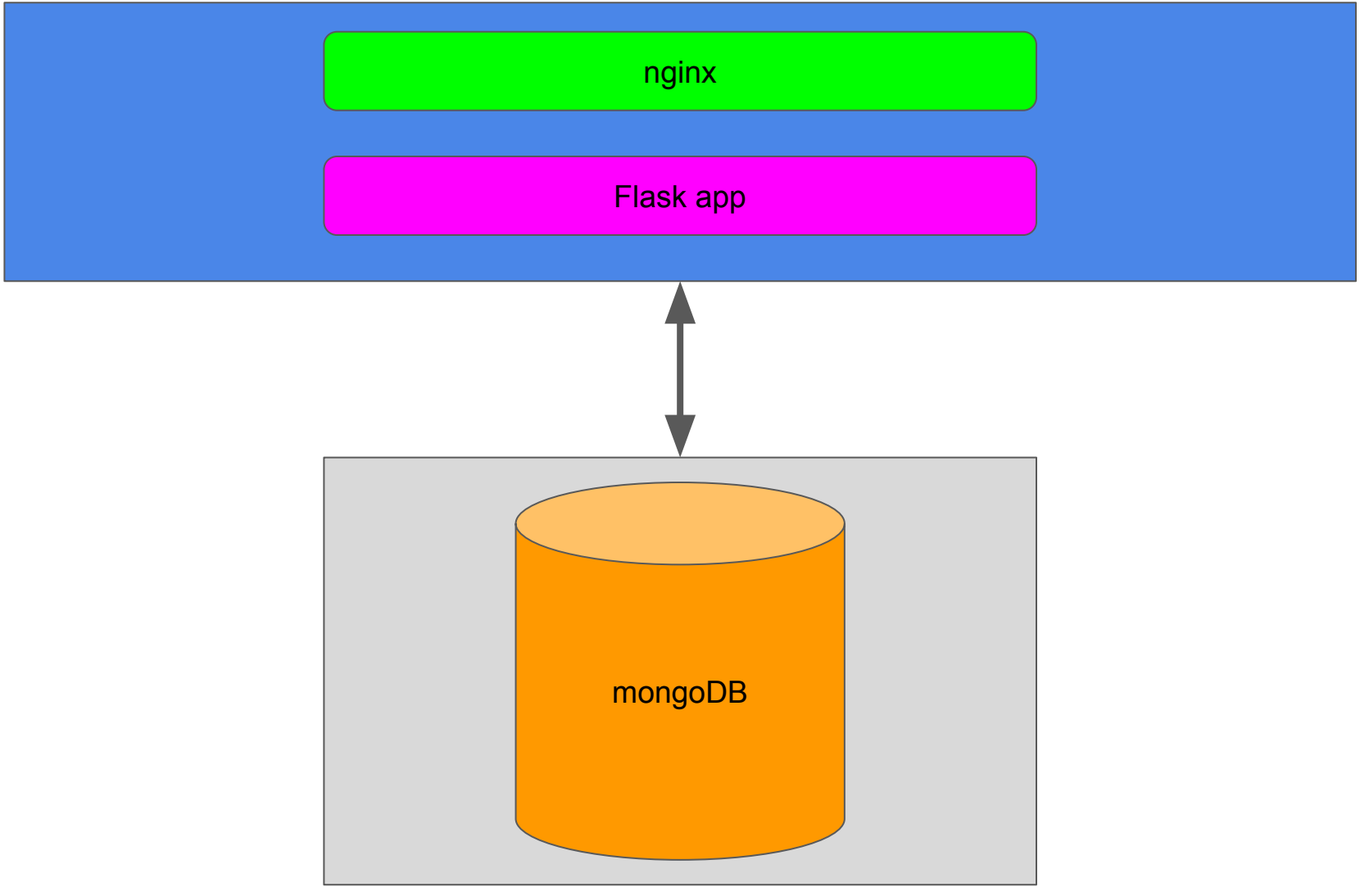
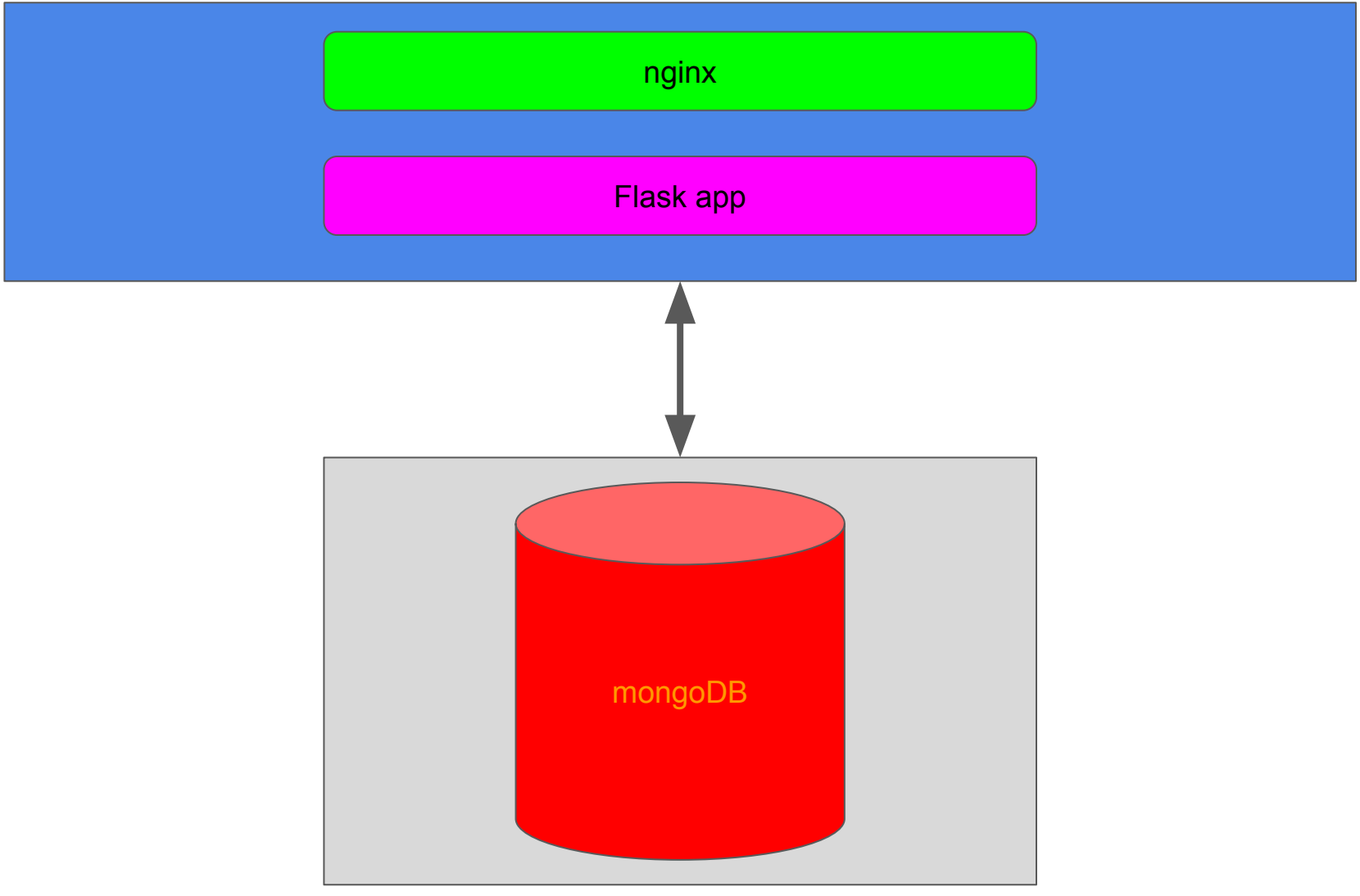

Planning for the worst
shit happens


@r4mnes & @ultrabug
Numberly
© Eric Fischer / Flickr


nginx
Flask app
mongoDB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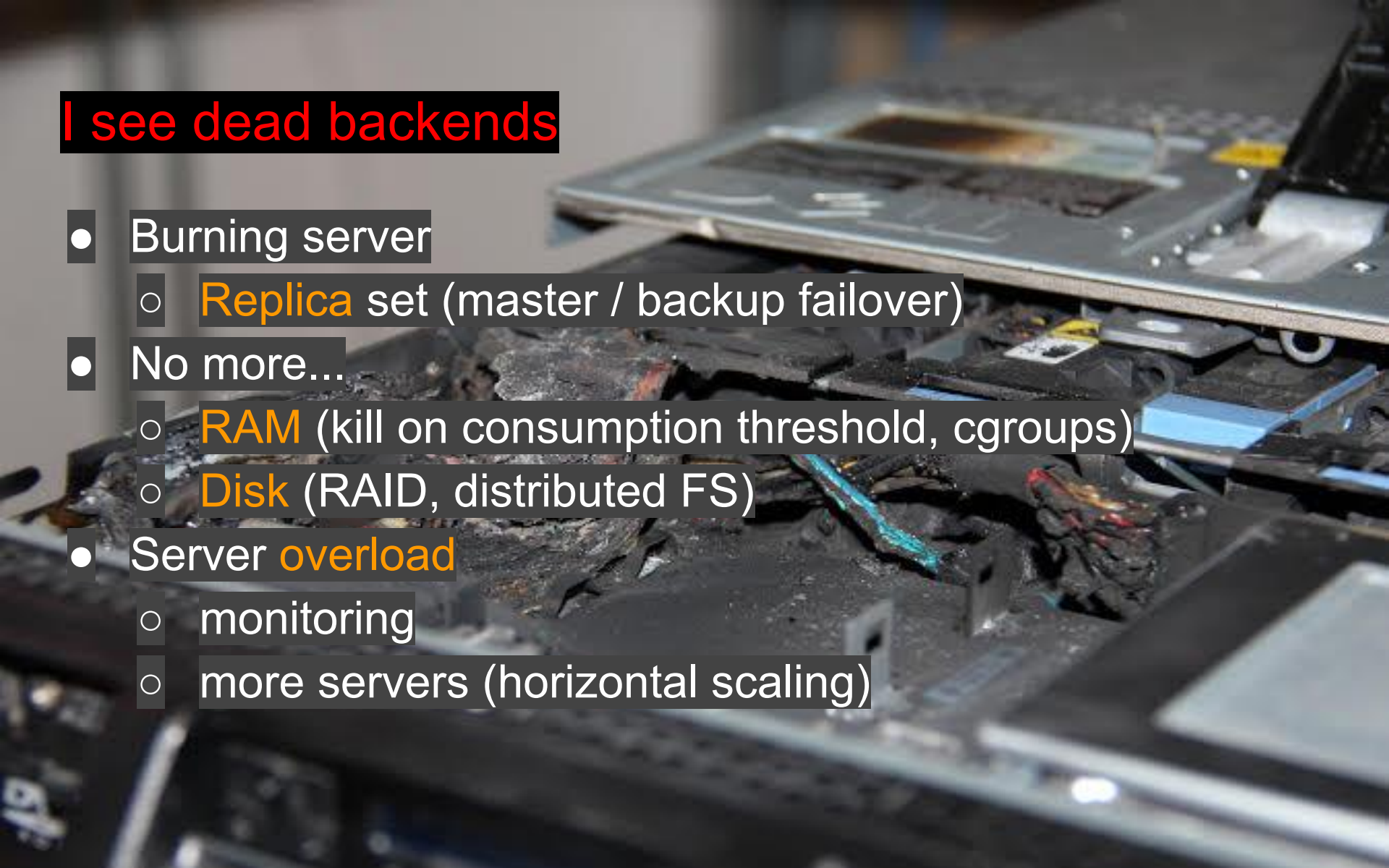
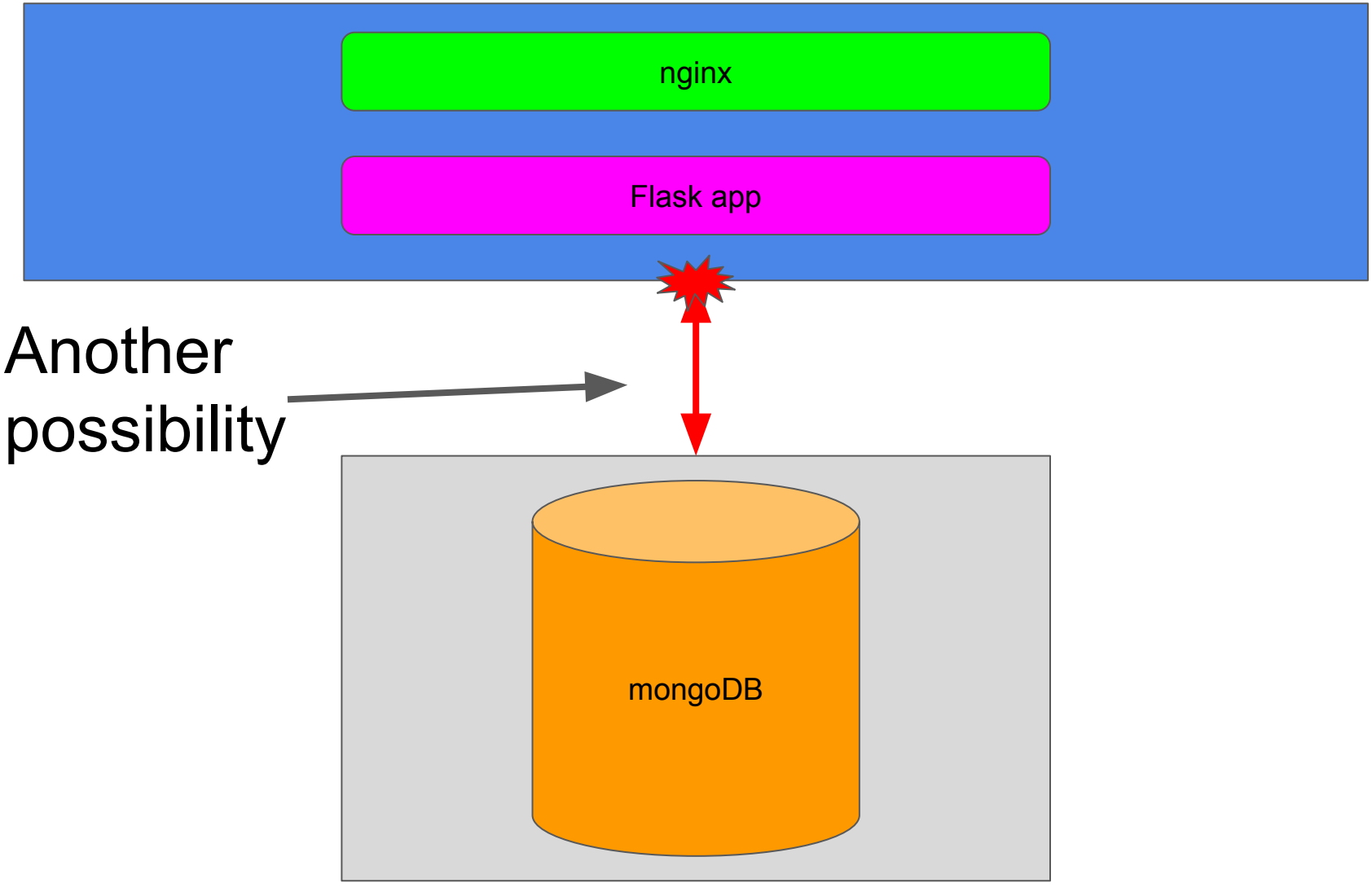
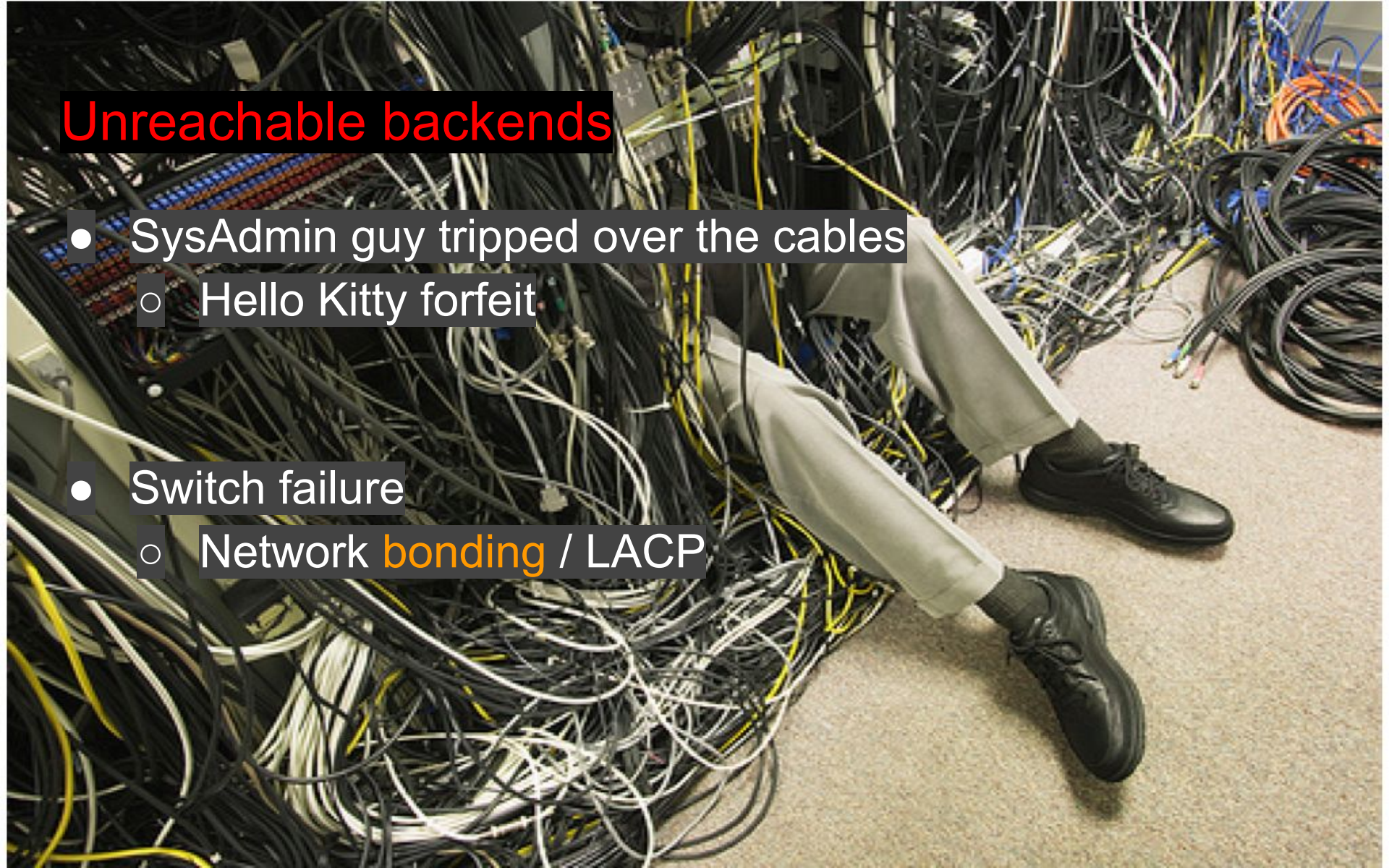


I see dead backends

- Burning server
  - Replica set (master / backup failover)
- No more...
  - RAM (kill on consumption threshold, cgroups)
  - Disk (RAID, distributed FS)
- Server overload
  - monitoring
  - more servers (horizontal scaling)

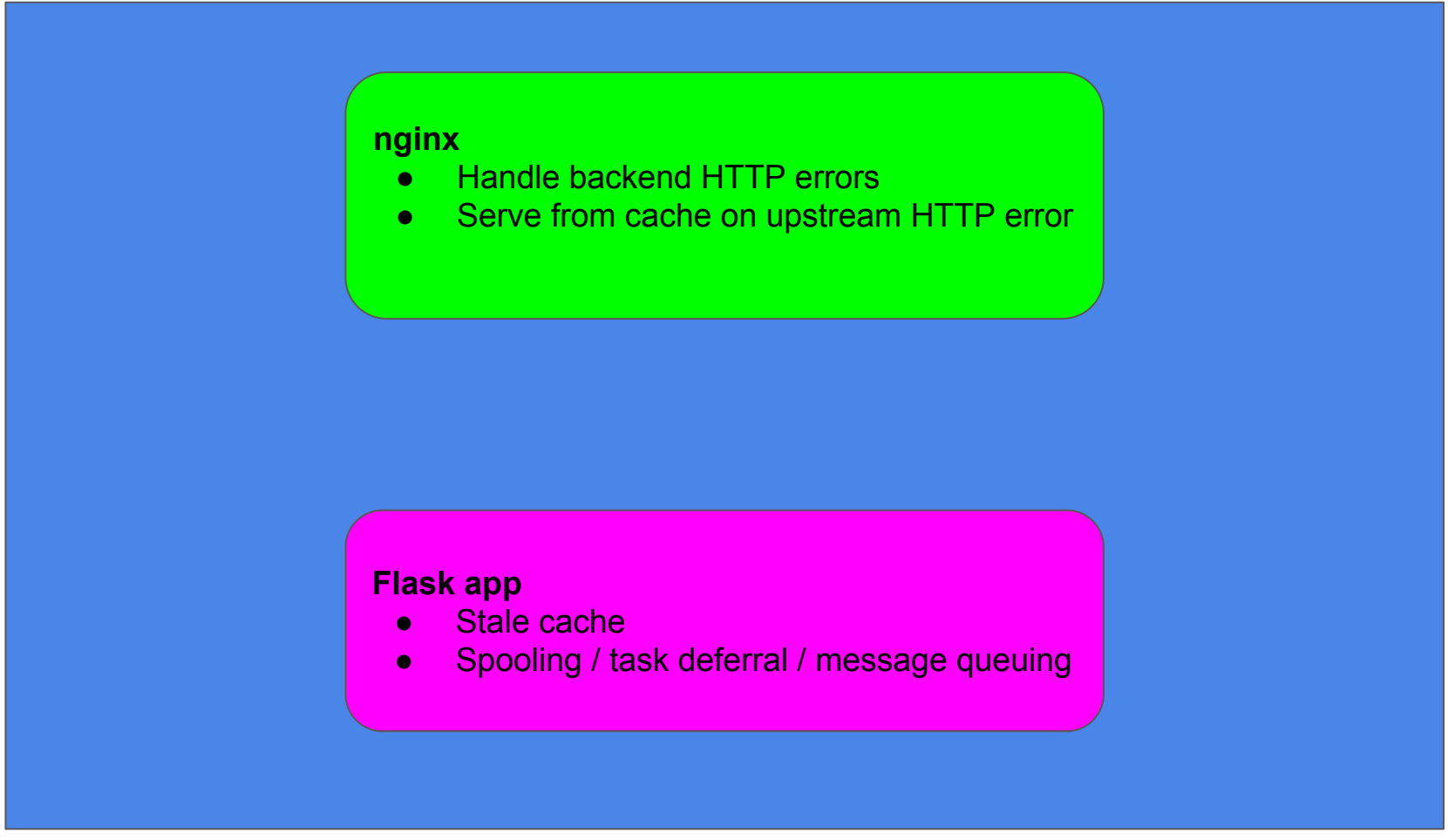

nginx
Flask app
Another
possibility
mongoDB



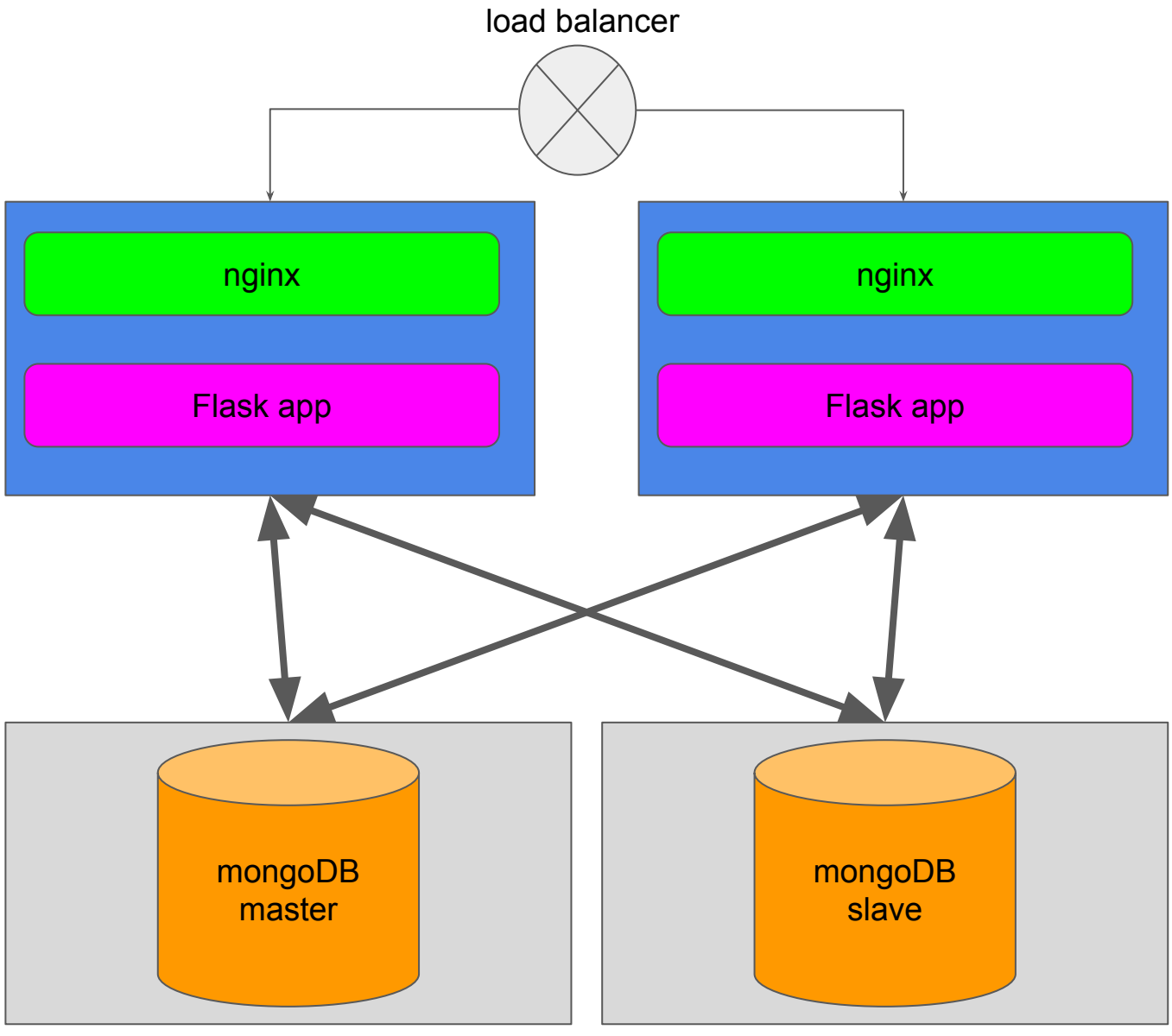
Unreachable backends

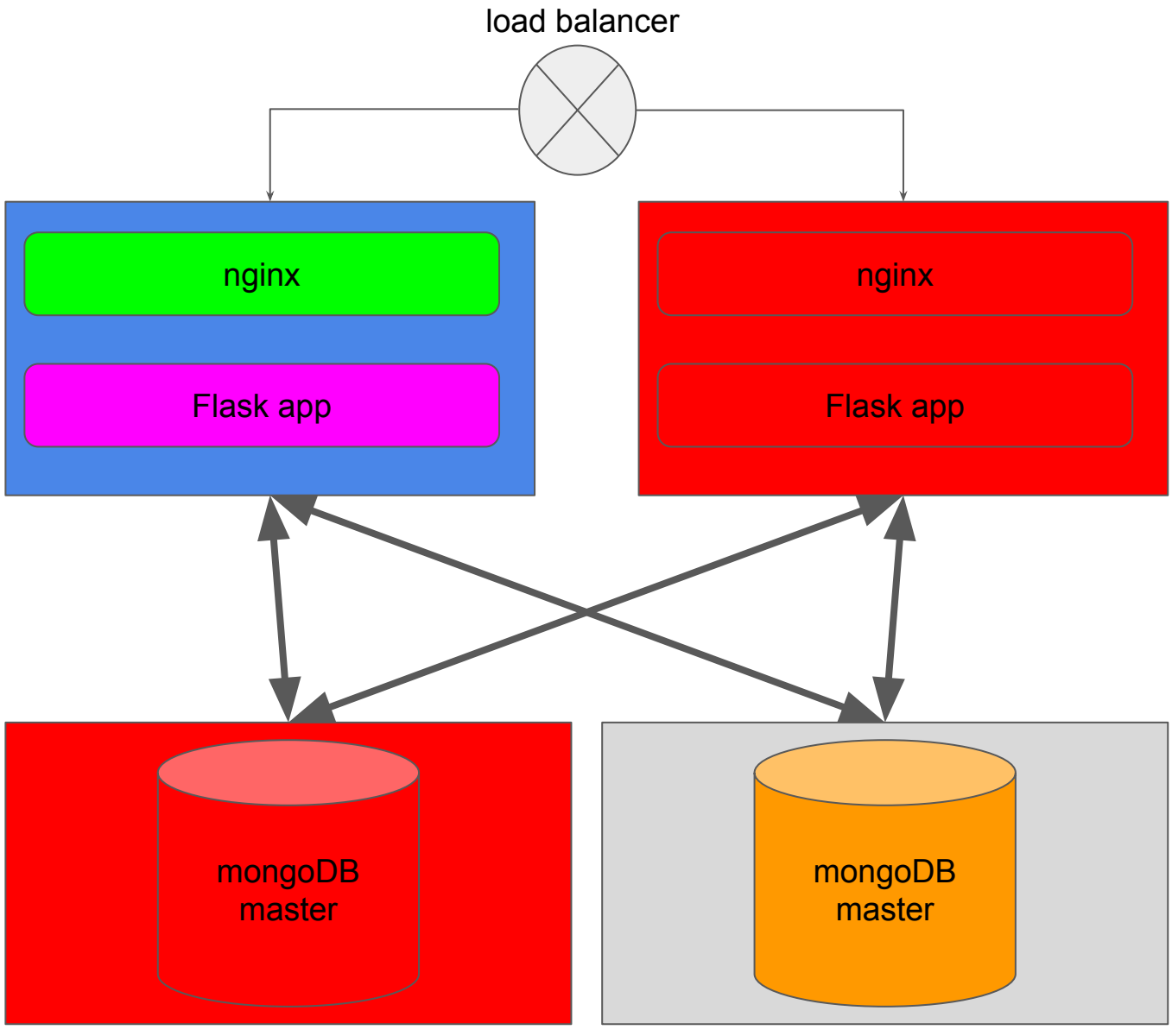
- SysAdmin guy tripped over the cables
  - Hello Kitty forfeit
- Switch failure
  - Network bonding / LACP

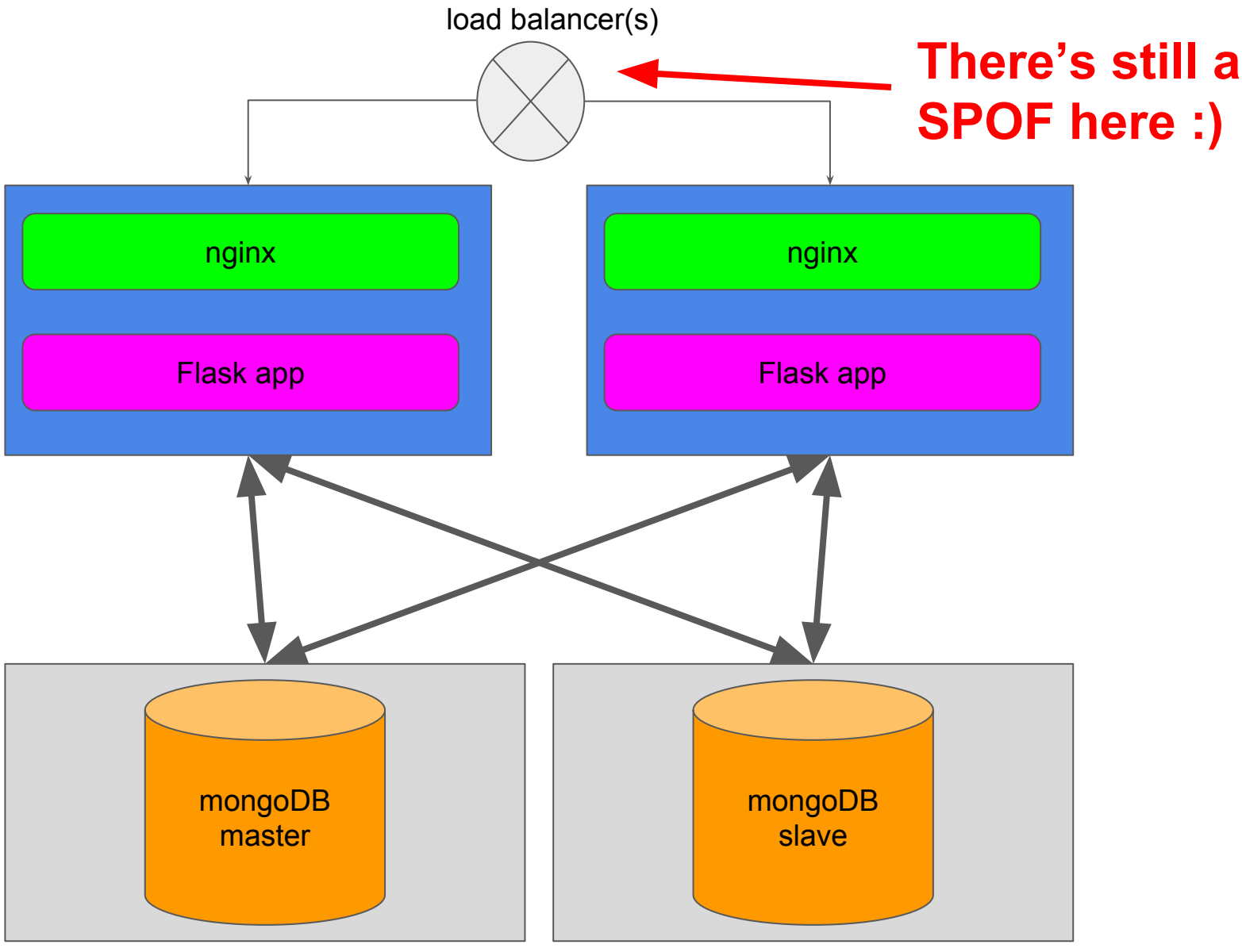
Fail proof stack & code

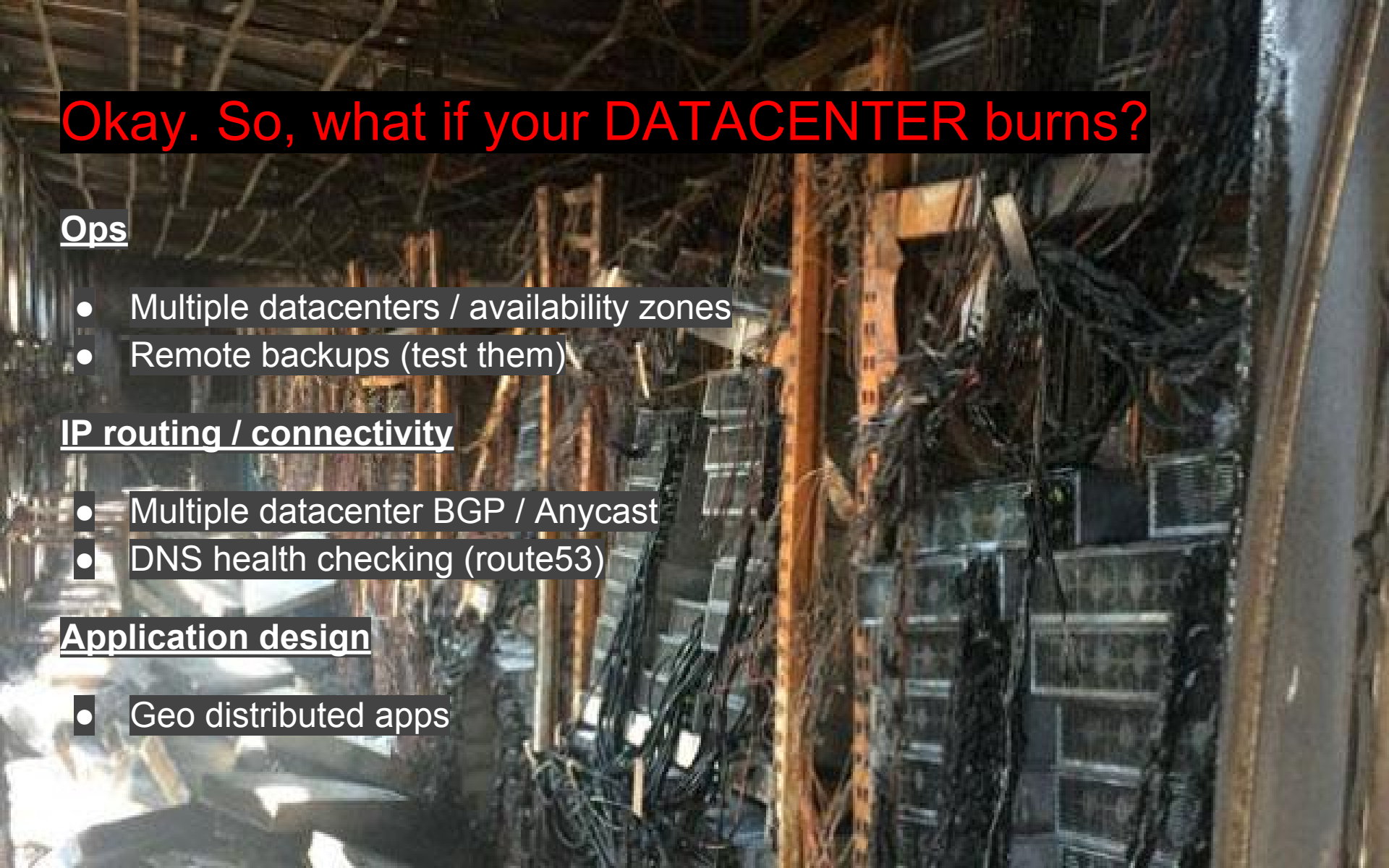



Clustering!


load balancer
nginx
Flask app
nginx
Flask app
mongoDB
master
mongoDB
slave


load balancer
nginx
Flask app
nginx
Flask app
mongoDB
master
mongoDB
master


load balancer(s)
There's still a SPOF here :)
nginx
Flask app
nginx
Flask app
mongoDB master
mongoDB slave



Okay. So, what if your DATACENTER burns?

Ops

- Multiple datacenters / availability zones
- Remote backups (test them)

IP routing / connectivity

- Multiple datacenter BGP / Anycast
- DNS health checking (route53)

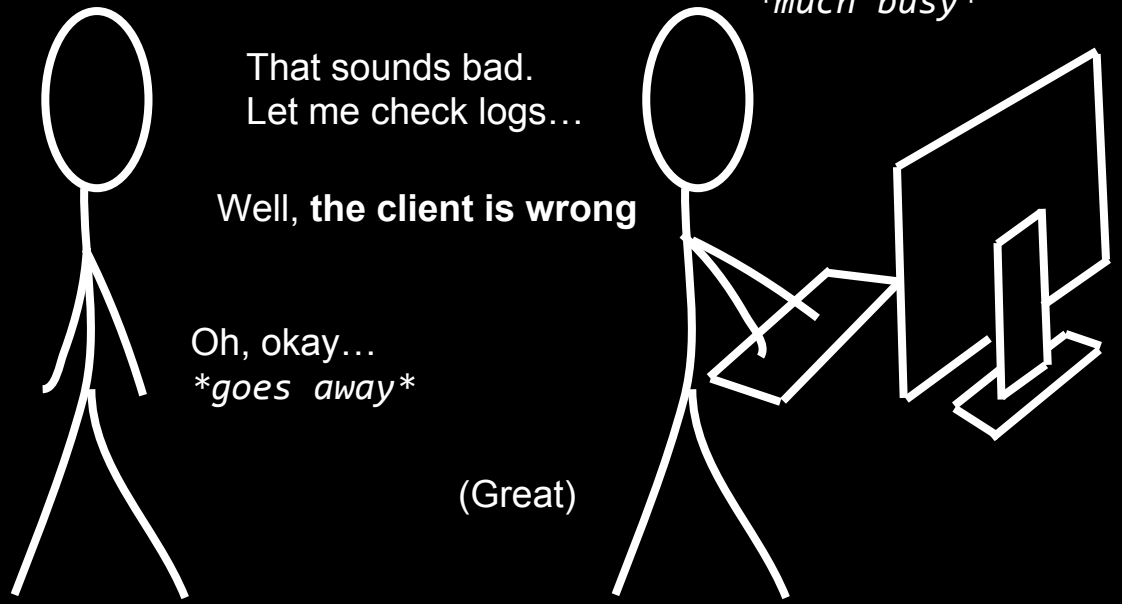
Application design

- Geo distributed apps


Real world
problems

Real world problem #1

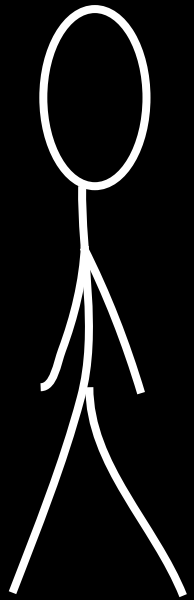
Hey ramnes, the client says he can't authenticate on the website! **Something's wrong!**



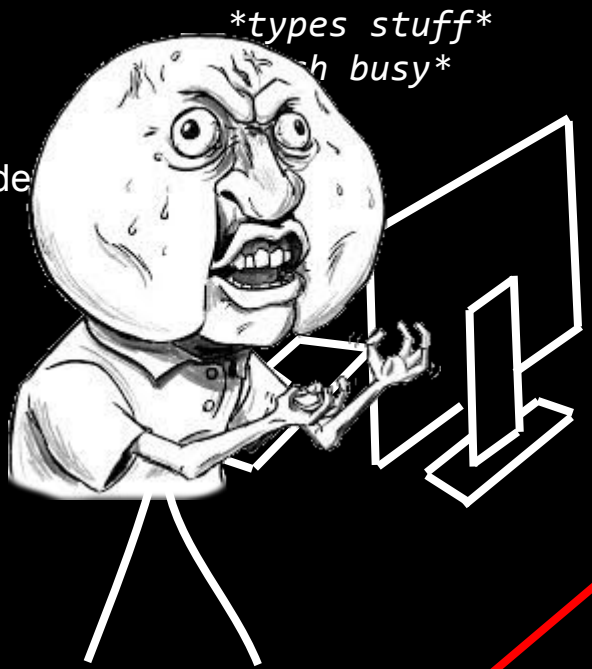

```
user@desktop$ ssh webserver
user@webserver$ cat app.log
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
[200 OK] GET /auth
```

Real world problem #1

Ramnes, **something's really wrong!** The client still can't connect!



Alright.
Let me check code




```
user@desktop$ cat app.py

...
@app.route("/auth")
def auth():
    """Old code.

    :author: Someone who left the
    company two years ago.
    """
    ...
    try:
        user.authenticate()
    except Exception as e:
        try:
            send_email(e)
            return 500, "ERROR!"
        except:
            pass
    return 200, "OK"
```

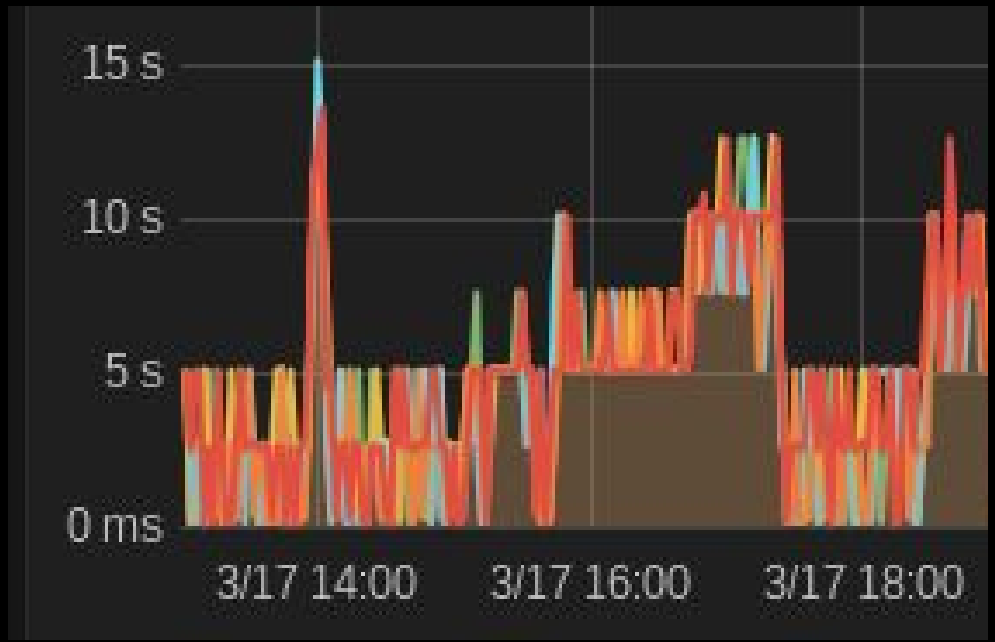
That function raises an Exception if the mail server is down.

conclusions
Real world problem #1

1. Know your code, refactorize when needed
   (even if someone else wrote it and that you don't like his coding style)
2. "Errors should never pass silently"
   (Zen of Python)

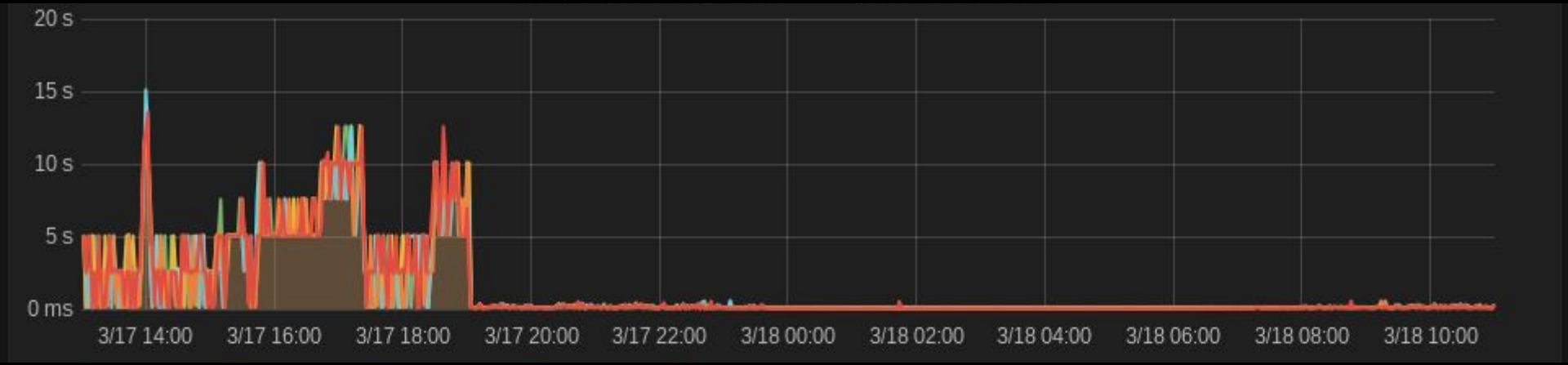
PS: Don't always blame ops guys.
The DevOps thing is great, you should try it.

Real world problem #2



Weird graph showing an abnormally high maximum processing time

Real world problem #2



And then one day…

solution

Real world problem #2

Local DNS resolution

```
root@server$ cat /etc/hosts
192.168.12.40 database-server-1
192.168.12.41 database-server-2
192.168.24.30 database-server-3
192.168.24.31 database-server-4
```

So it doesn’t overload your DNS server when your code tries to access your database with its domain name