monitoring on a budget

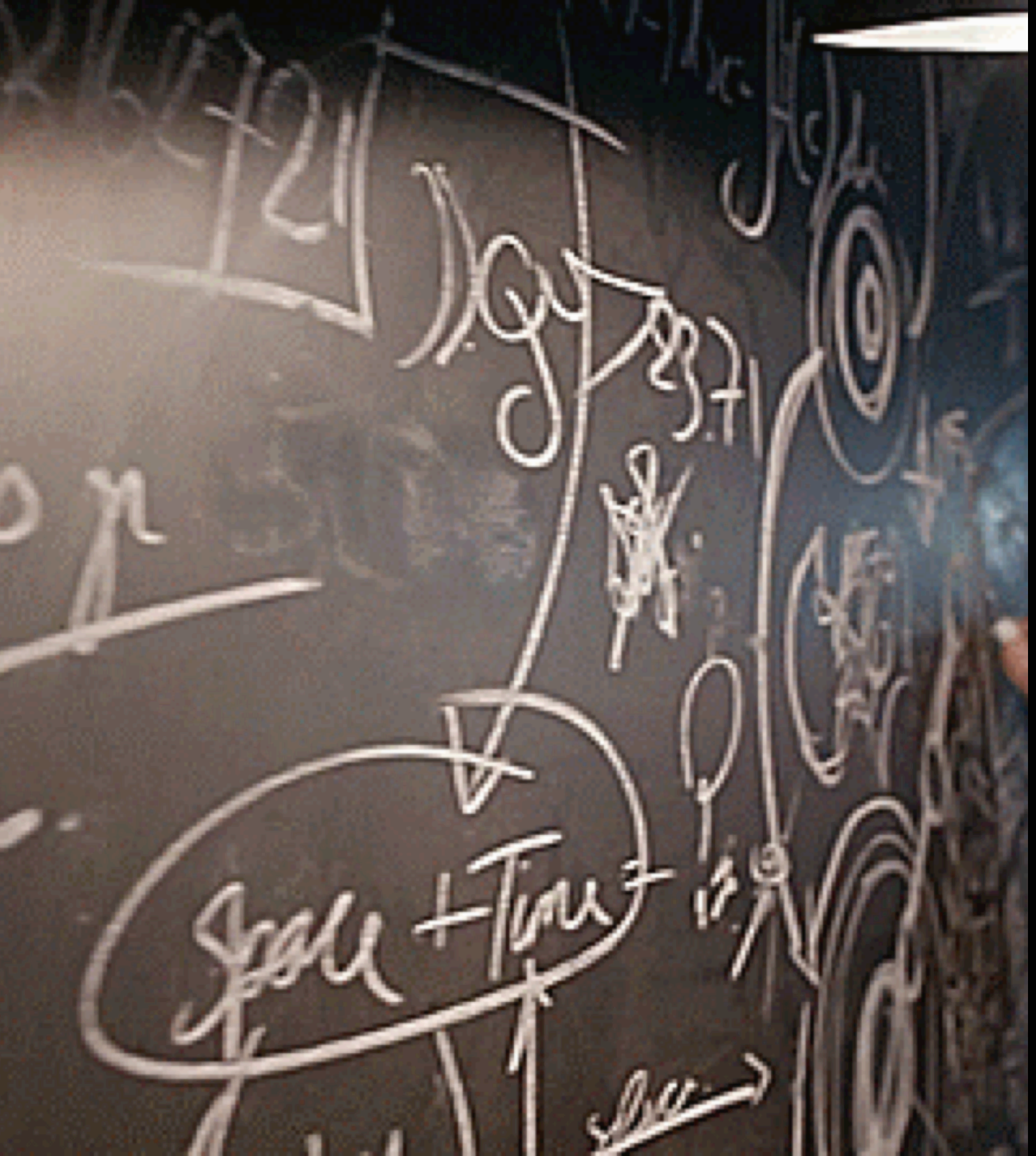
a few animated gifs

with the Twelfth Doctor (0 cats)

C J Silverio

vp of engineering, npm

@ceejbot



let's talk npm by the numbers

205 million packages Tuesday

10K requests/sec

npm is 25 people

4 of us run the registry

when the company was formed

5 people total

you outsource many services

when you're tiny

you pull them back in-house

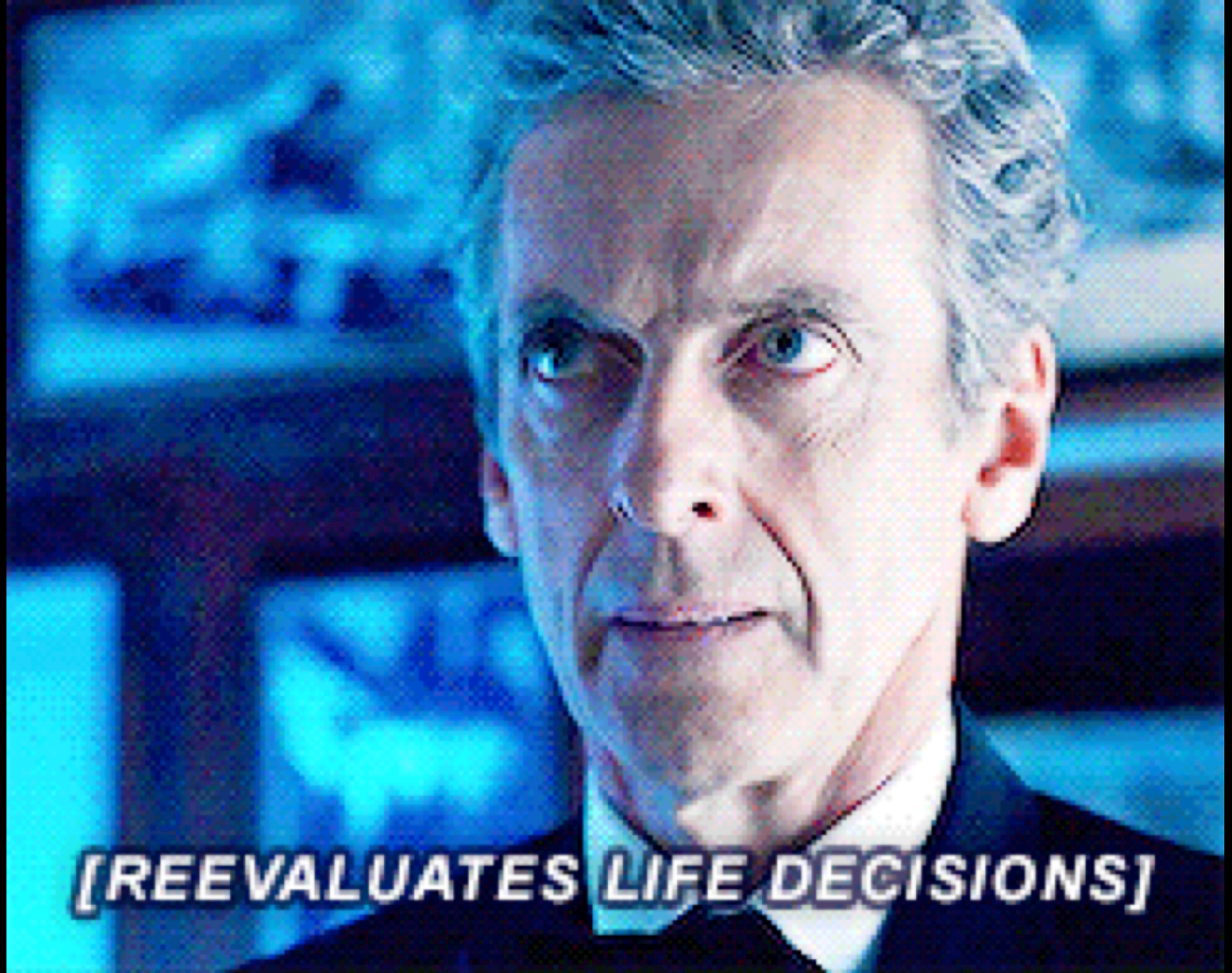
when you succeed

success is sometimes a catastrophe

npm's scale: runaway success

npm's staff: wouldn't this be neat

mission: know this on a budget


[REEVALUATES LIFE DECISIONS]

2 questions:

is the registry up?

how well is it performing?

is the registry up?

monitoring

how well is it performing?

metrics

monitoring

monitoring == pull

ask questions that you know the right answers for

Is this host up?

Is this cert about to expire?

Is the DB replication keeping up?

if you get the wrong answer somebody gets paged

nagios

state of the art in free

Nagios®

General

- Home
- Documentation

Current Status

- Tactical Overview
- Map
- Hosts
- Services
- Host Groups
  - Summary
  - Grid
- Service Groups
  - Summary
  - Grid
- Problems
  - Services (Unhandled)
  - Hosts (Unhandled)
  - Network Outages

Quick Search:

Reports

- Availability
- Trends
- Alerts
  - History
  - Summary
  - Histogram
- Notifications
- Event Log

System

- Comments
- Downtime
- Process Info
- Performance Info
- Scheduling Queue
- Configuration

Current Network Status
Last Updated: Thu Feb 11 23:53:07 UTC 2016
Updated every 90 seconds
Nagios® Core™ 4.0.6 - www.nagios.org
Logged in as *nagiosadmin*

View Service Status Detail For All Host Groups
View Status Overview For All Host Groups
View Status Summary For All Host Groups
View Status Grid For All Host Groups

Host Status Totals

Up	Down	Unreachable	Pending
78	0	0	0

All Problems	All Types
0	78

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
598	0	0	0	0

All Problems	All Types
0	598

Host Status Details For All Host Groups

Limit Results: 100

Host	Status	Last Check	Duration	Status Information
access-cache-1-west	UP	02-11-2016 23:52:42	13d 6h 5m 25s	PING OK - Packet loss = 0%, RTA = 1.20 ms
apex-redirector	UP	02-11-2016 23:52:34	13d 6h 4m 47s	PING OK - Packet loss = 0%, RTA = 0.87 ms
billing-api-1-west	UP	02-11-2016 23:52:12	13d 6h 5m 24s	PING OK - Packet loss = 0%, RTA = 0.40 ms
db-loadbalancer-1-east	UP	02-11-2016 23:52:45	13d 6h 5m 44s	PING OK - Packet loss = 0%, RTA = 85.28 ms
db-loadbalancer-2-west	UP	02-11-2016 23:52:59	13d 6h 5m 23s	PING OK - Packet loss = 0%, RTA = 0.84 ms
docs-2-west	UP	02-11-2016 23:52:15	13d 6h 5m 22s	PING OK - Packet loss = 0%, RTA = 0.33 ms
downloads-3-west	UP	02-11-2016 23:52:52	13d 6h 5m 22s	PING OK - Packet loss = 0%, RTA = 0.26 ms
enterprise-4-west	UP	02-11-2016 23:52:26	13d 6h 5m 21s	PING OK - Packet loss = 0%, RTA = 0.41 ms
etcd-1-west	UP	02-11-2016 23:52:24	13d 6h 5m 21s	PING OK - Packet loss = 0%, RTA = 0.38 ms
fastly	UP	02-11-2016 23:52:04	13d 6h 2m 50s	PING OK - Packet loss = 0%, RTA = 0.04 ms
fastly-purge-2	UP	02-11-2016 23:51:56	13d 6h 5m 20s	PING OK - Packet loss = 0%, RTA = 1.22 ms
fastlylogs-4-east	UP	02-11-2016 23:52:55	13d 6h 5m 20s	PING OK - Packet loss = 0%, RTA = 72.60 ms
frontdoor-1-eu	UP	02-11-2016 23:52:41	13d 6h 5m 19s	PING OK - Packet loss = 0%, RTA = 156.68 ms
frontdoor-10-east	UP	02-11-2016 23:52:21	8d 4h 13m 43s	PING OK - Packet loss = 0%, RTA = 83.70 ms
frontdoor-11-east	UP	02-11-2016 23:52:09	2d 20h 7m 29s	PING OK - Packet loss = 0%, RTA = 78.93 ms
frontdoor-12-west	UP	02-11-2016 23:52:42	7d 4h 15m 2s	PING OK - Packet loss = 0%, RTA = 0.30 ms
frontdoor-13-west	UP	02-11-2016 23:52:56	7d 4h 15m 1s	PING OK - Packet loss = 0%, RTA = 1.15 ms
frontdoor-6-west	UP	02-11-2016 23:51:58	13d 6h 5m 45s	PING OK - Packet loss = 0%, RTA = 1.27 ms
frontdoor-7-east	UP	02-11-2016 23:52:06	0d 3h 25m 47s	PING OK - Packet loss = 0%, RTA = 69.81 ms
frontdoor-8-west	UP	02-11-2016 23:51:56	9d 1h 25m 23s	PING OK - Packet loss = 0%, RTA = 0.42 ms
frontdoor-9-east	UP	02-11-2016 23:52:51	9d 0h 22m 29s	PING OK - Packet loss = 0%, RTA = 74.75 ms
frontdoor-canary-2	UP	02-11-2016 23:52:29	13d 6h 6m 1s	PING OK - Packet loss = 0%, RTA = 0.82 ms

It's okay. We never look at it.

It just triggers Pager Duty.

nagios's virtues:

reliability & custom checks

goal: never page anybody

self-healing checks

automate the fix if you can!

monitoring == unit tests

a ratchet for continuous improvement

external monitoring

ping services

you must monitor
but that's just the start

monitoring tells you what
it doesn't tell you why

metrics

Q: What's a metric?

A: A name + a value + a time.

counter: it happened **N** times

gauge: it's **Y**-sized right now

rate: it's happening **N** times/second

timing: it took **X** milliseconds

metrics == push

the app gives you numbers

emit from a service
store in timeseries db
query & graph

the usual stack

statsd → graphite → grafana

Big Dashboard

Zoom Out

Oct 4, 2015 11:29:09 to Oct 4, 2015 14:13:23

Logins

172

Sign ups

263

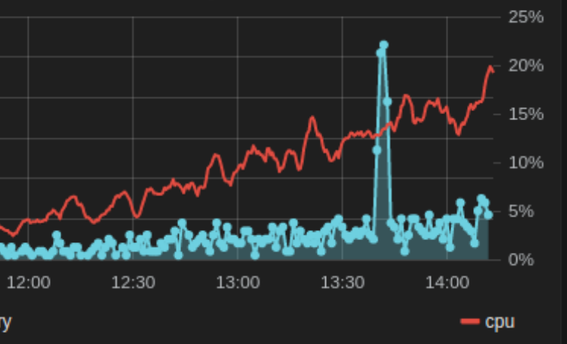
Sign outs

268

Support calls

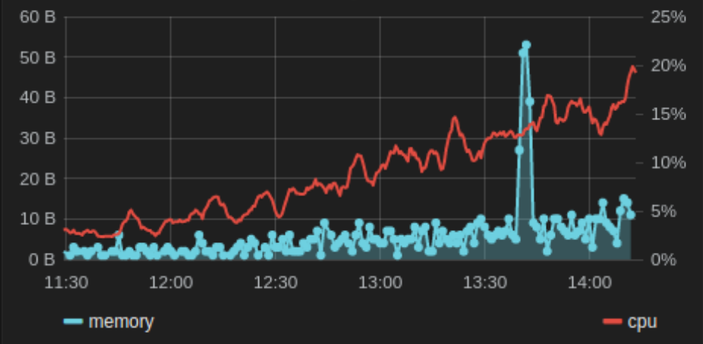
80

Memory / CPU



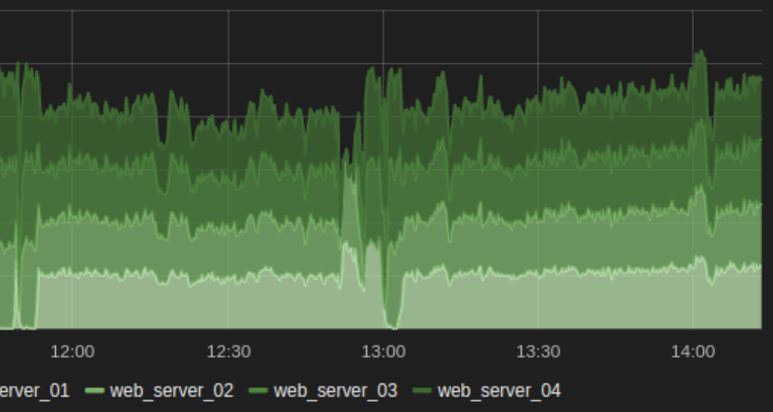
logins

Memory / CPU

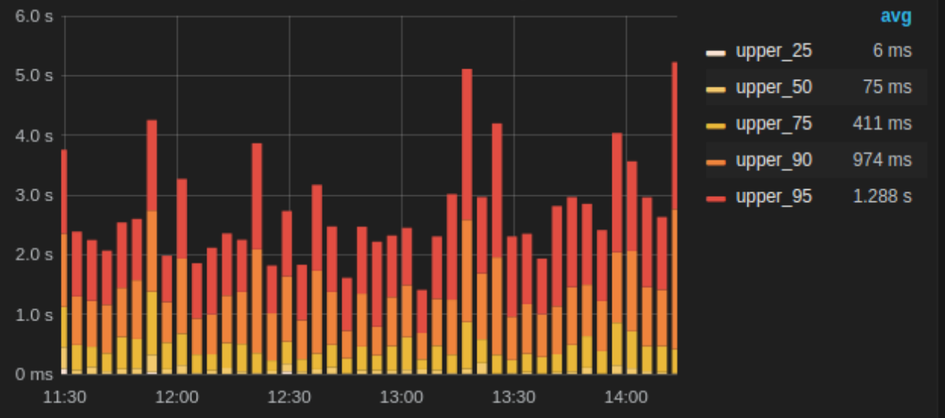


logins

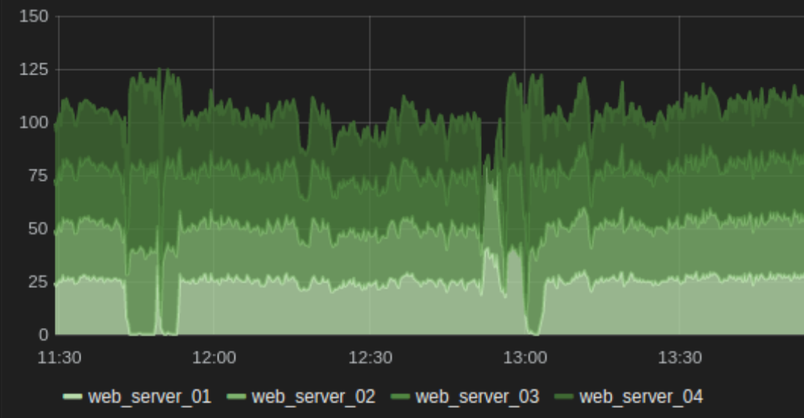
server requests

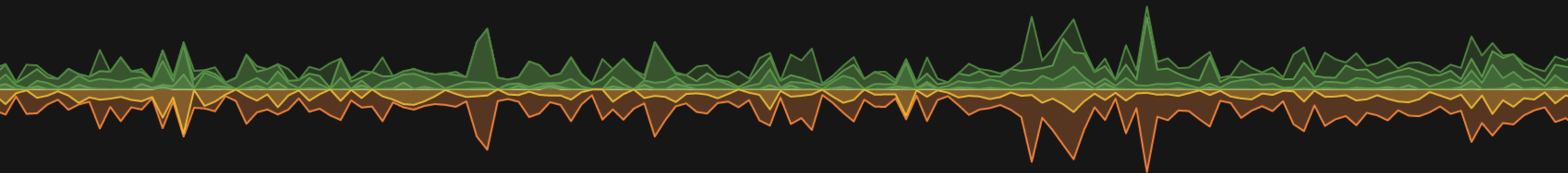


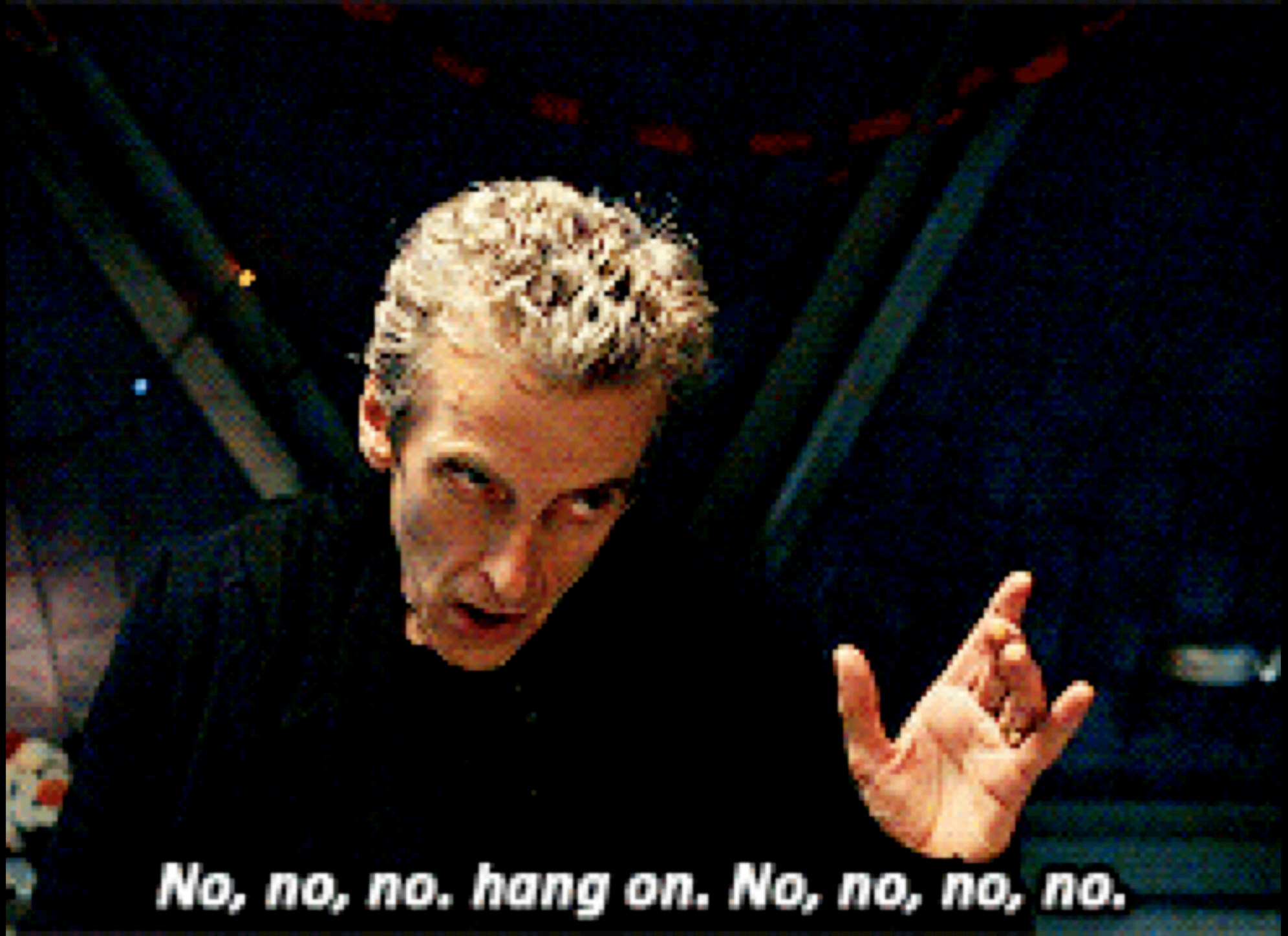
client side full page load

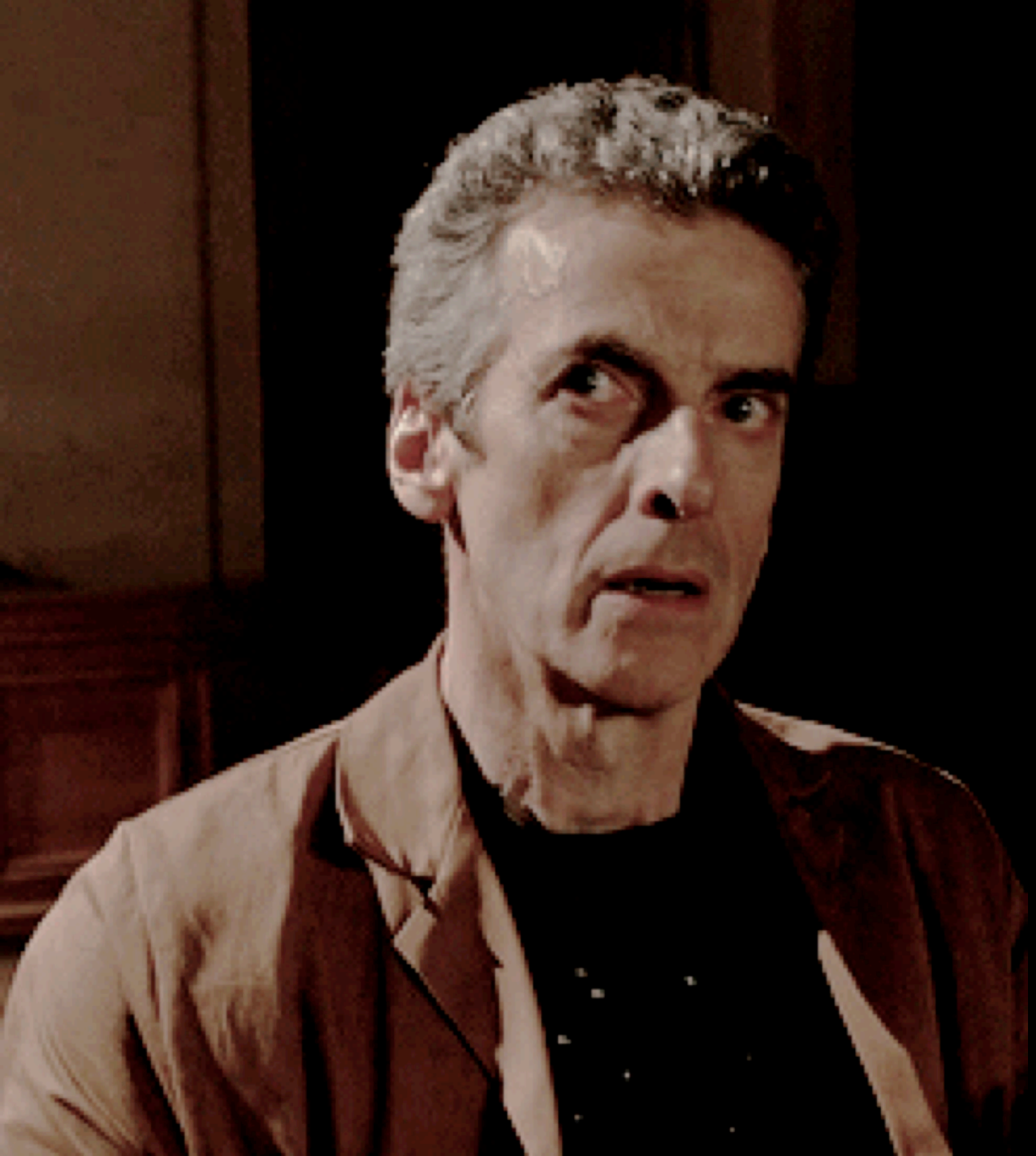


server requests





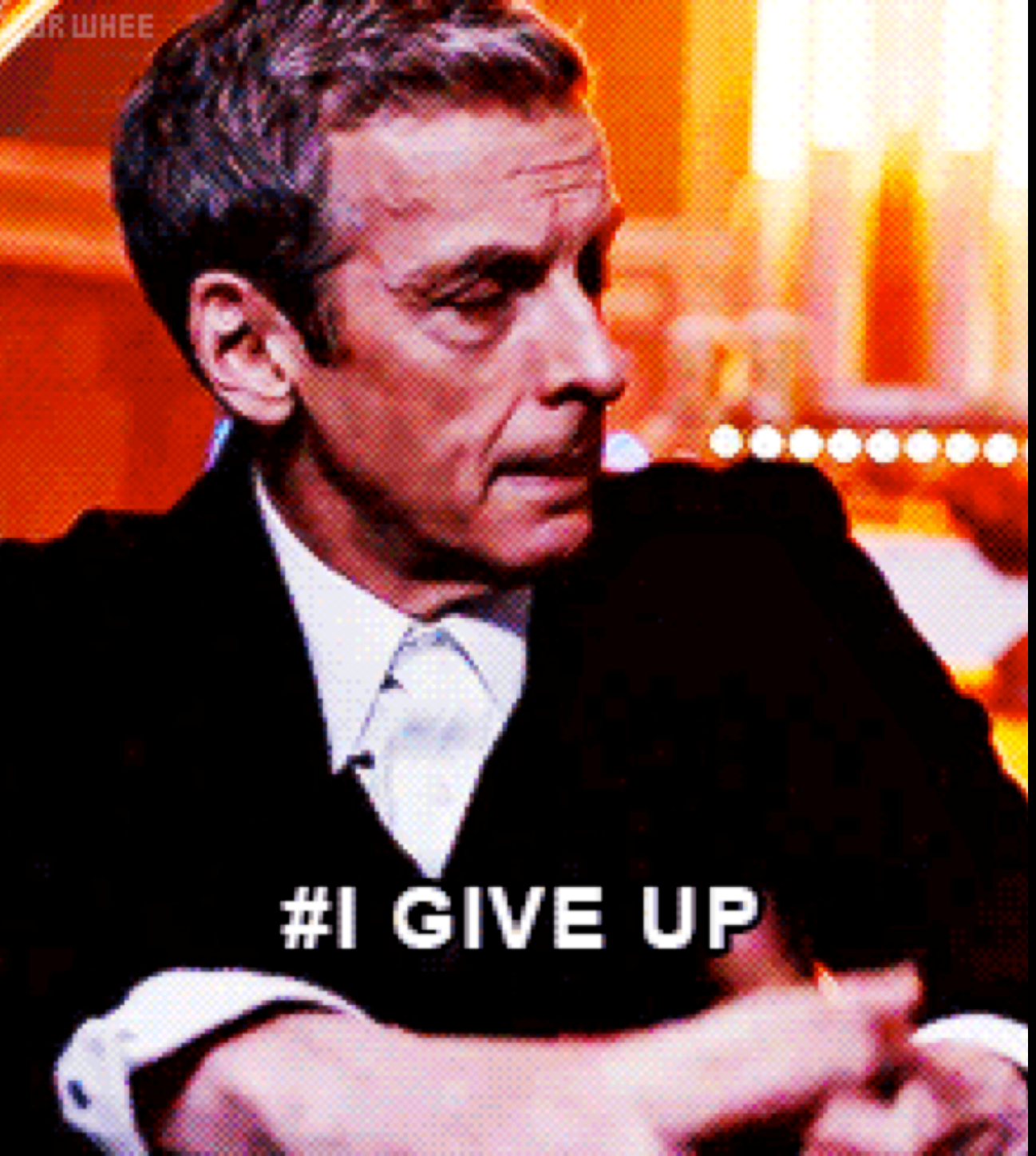

No, no, no. hang on. No, no, no, no.



statsd uses UDP

Q: Why not send metrics over UDP?

A: You care about receiving them.



just try to install graphite

for-pay/SAAS services exist but I can't afford them

monitoring 400 processes right now

12+ GB of log data a day

interlude:
when should you pay?

convert the £$€ cost into engineer hours/month

pay when it's cheaper than investing an engineer (be honest about the cost)

numbat was born

“How hard can it be?” I said.


#COME AT ME BRO!

https://github.com/numbat-metrics

numbat - powered metrics

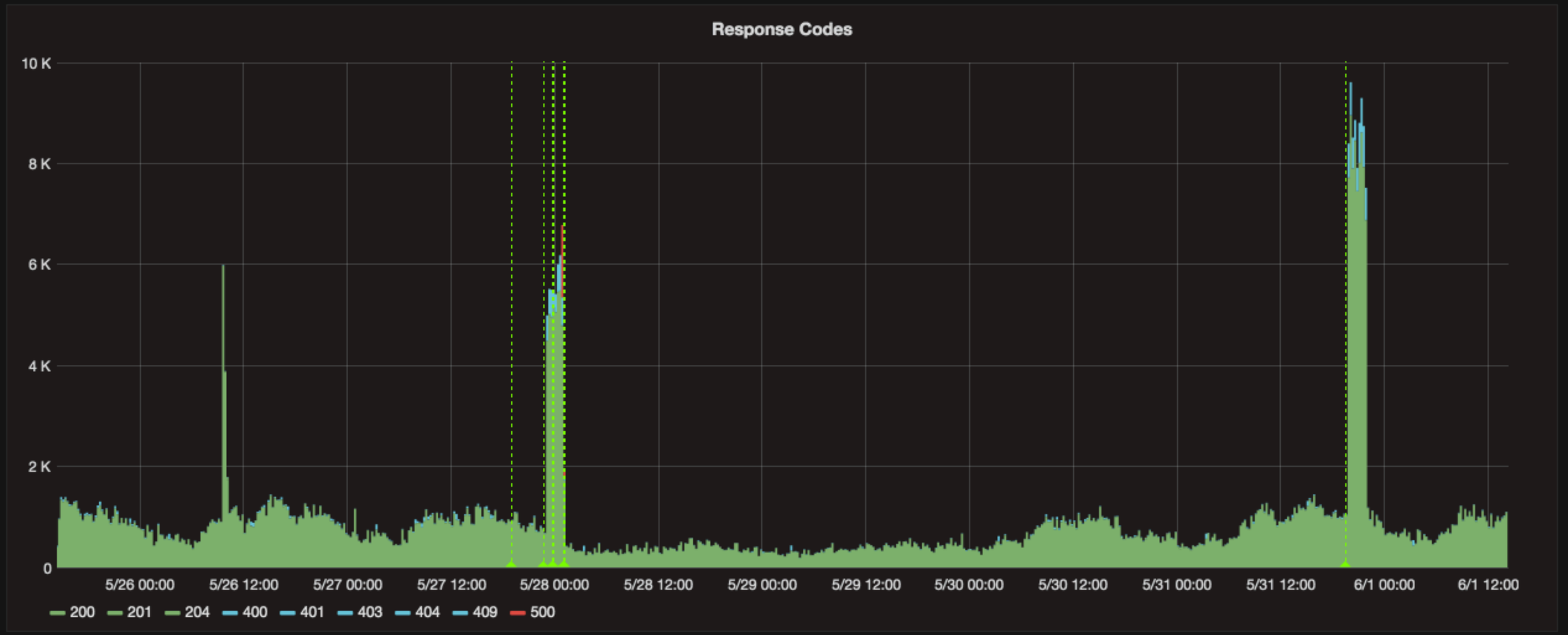
npm's stack

numbat → influxdb → grafana

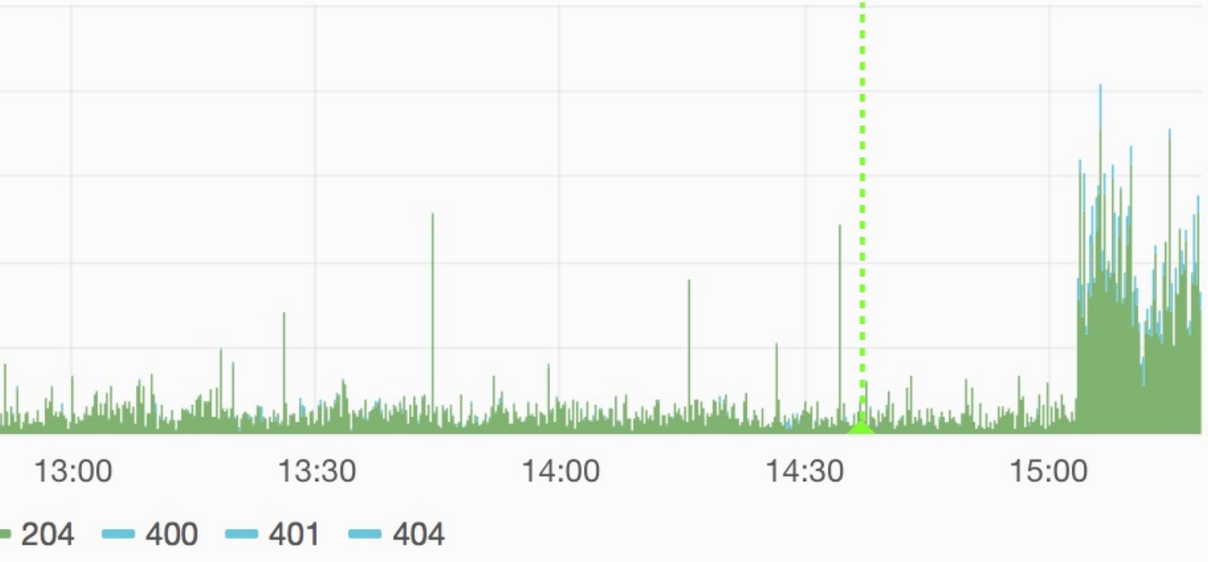
```
var Emitter = require('numbat-emitter');

var emitter = new Emitter({
    uri: 'tcp://localhost:3333',
    app: 'www',
});

process.emit('metric', { name: 'request.latency', value: 30 });
process.emit('metric', { name: 'disk.used.percent', value: 36 });
process.emit('metric', { name: 'login' });
```

so easy to emit a metric that we just do it any time something interesting happens

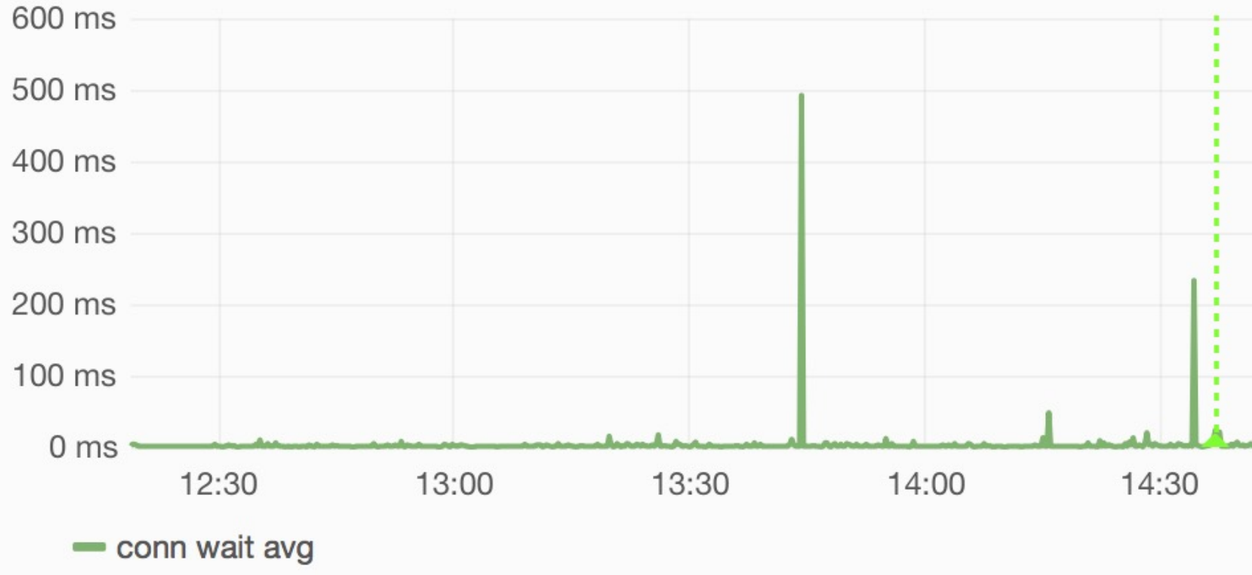
4000 metrics/sec from the registry


Response Codes
10 K
8 K
6 K
4 K
2 K
0
5/26 00:00
5/26 12:00
5/27 00:00
5/27 12:00
5/28 00:00
5/28 12:00
5/29 00:00
5/29 12:00
5/30 00:00
5/30 12:00
5/31 00:00
5/31 12:00
6/1 00:00
6/1 12:00
200
201
204
400
401
403
404
409
500

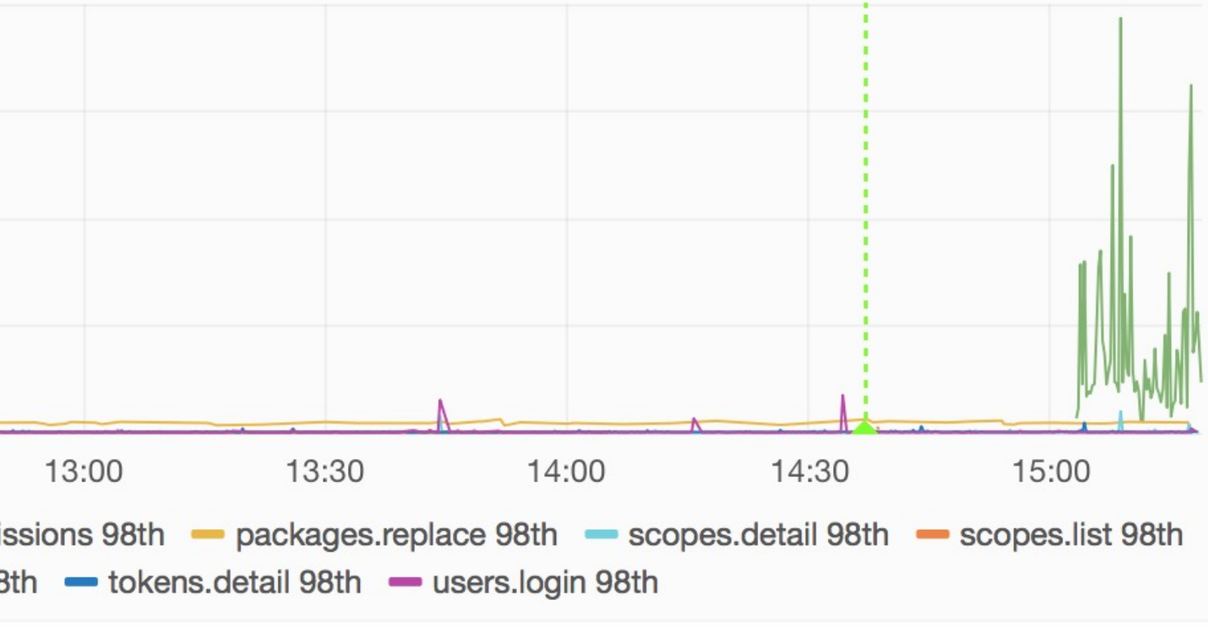
Response Codes



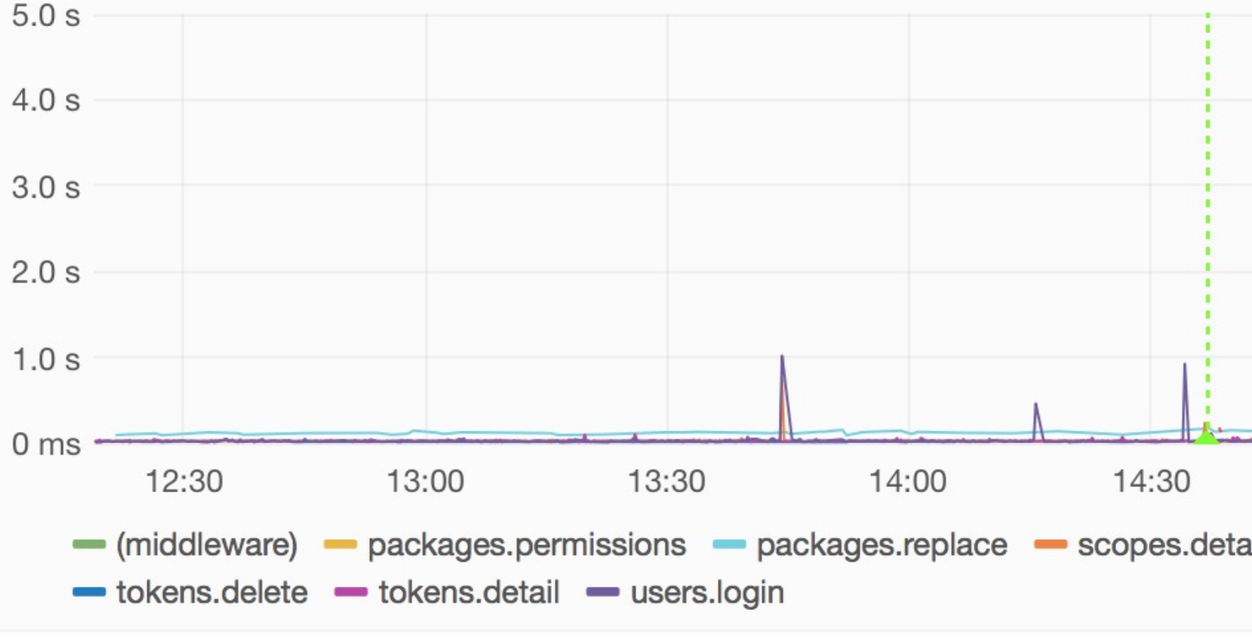
connection wait



transaction duration (by view)

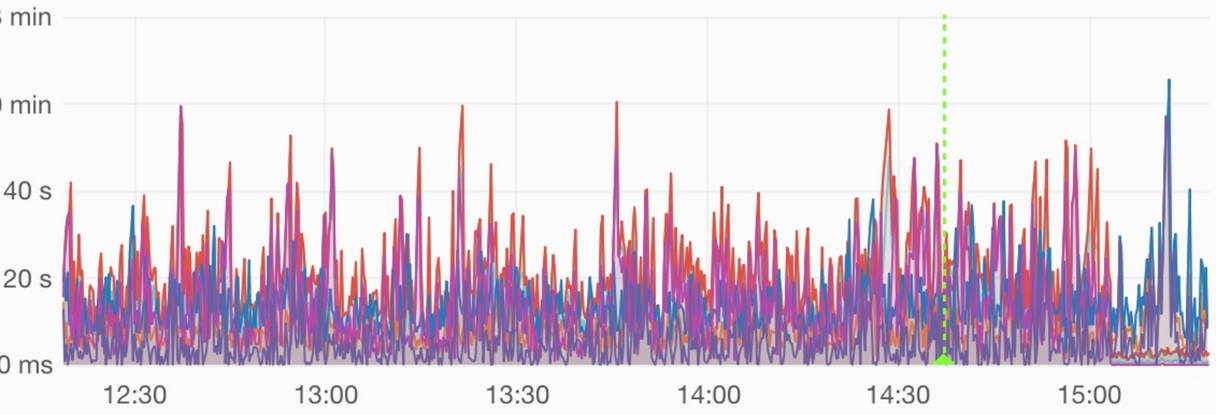


latency (by route)



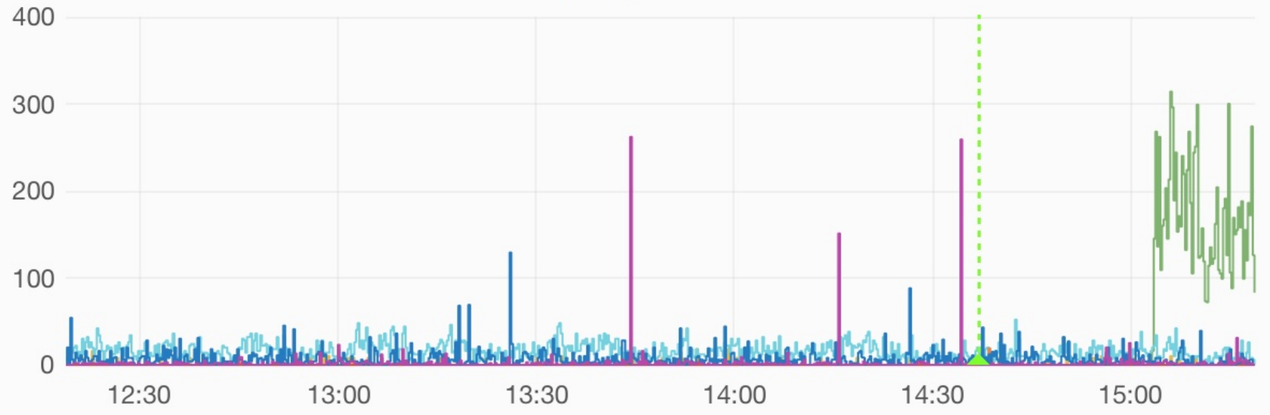

Oh, that can't
be good.

idletime



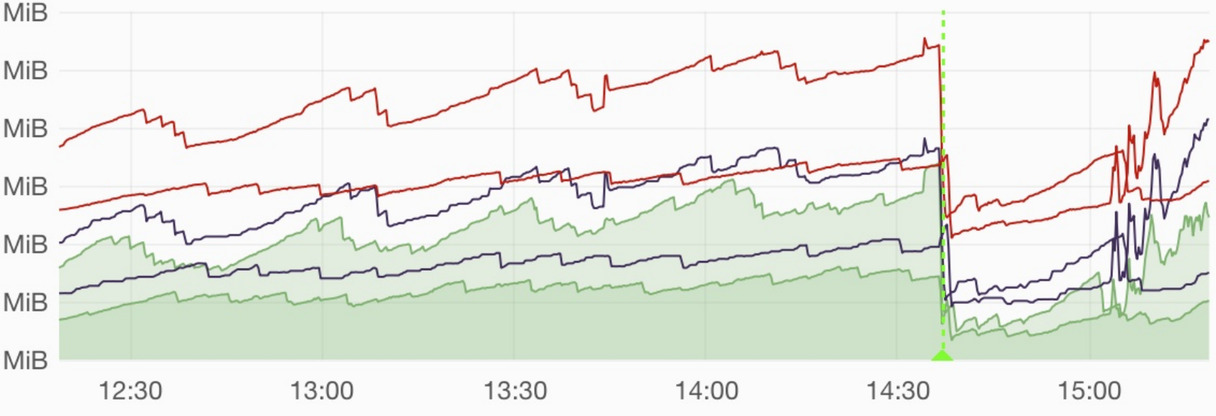
98th user-acl-3-west.internal.npmjs.com
98th user-acl-4-west.internal.npmjs.com
mean user-acl-3-west.internal.npmjs.com
mean user-acl-4-west.internal.npmjs.com
max user-acl-3-west.internal.npmjs.com
max user-acl-4-west.internal.npmjs.com
min user-acl-3-west.internal.npmjs.com
min user-acl-4-west.internal.npmjs.com

query counts



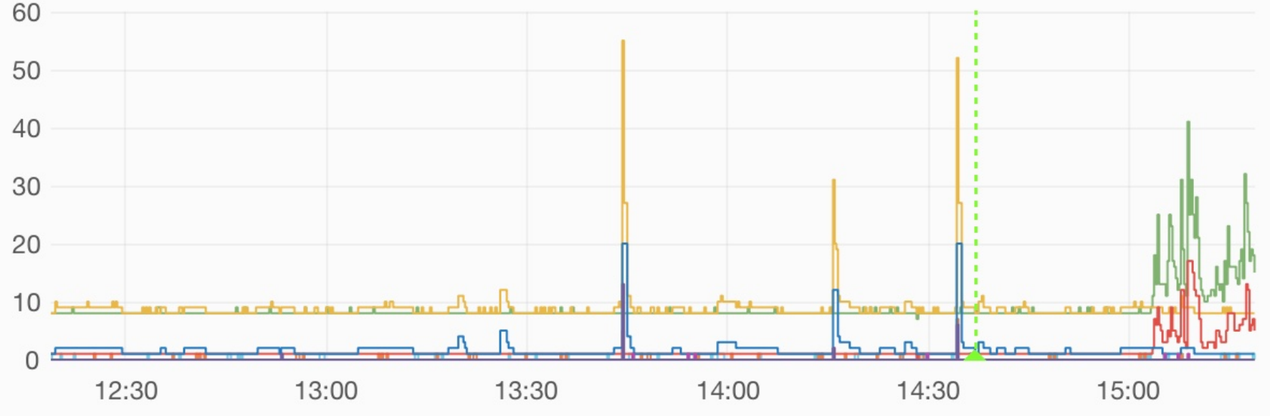
packages.permissions
packages.replace
scopes.detail
scopes.list
tokens.delete
tokens.detail
users.login

memory usage (by host)



user-acl-3-west.internal.npmjs.com used heap
user-acl-4-west.internal.npmjs.com used heap
user-acl-3-west.internal.npmjs.com total heap
user-acl-4-west.internal.npmjs.com total heap
user-acl-3-west.internal.npmjs.com resident set size
user-acl-4-west.internal.npmjs.com resident set size

uv handles / requests + pg waiting/avail



user-acl-3-west.internal.npmjs.com uv handles
user-acl-4-west.internal.npmjs.com uv handles
user-acl-3-west.internal.npmjs.com uv requests
user-acl-4-west.internal.npmjs.com uv requests
user-acl-3-west.internal.npmjs.com available pg connections
user-acl-4-west.internal.npmjs.com available pg connections
user-acl-3-west.internal.npmjs.com waiting for pg connections
user-acl-4-west.internal.npmjs.com waiting for pg connections

metrics → alerts

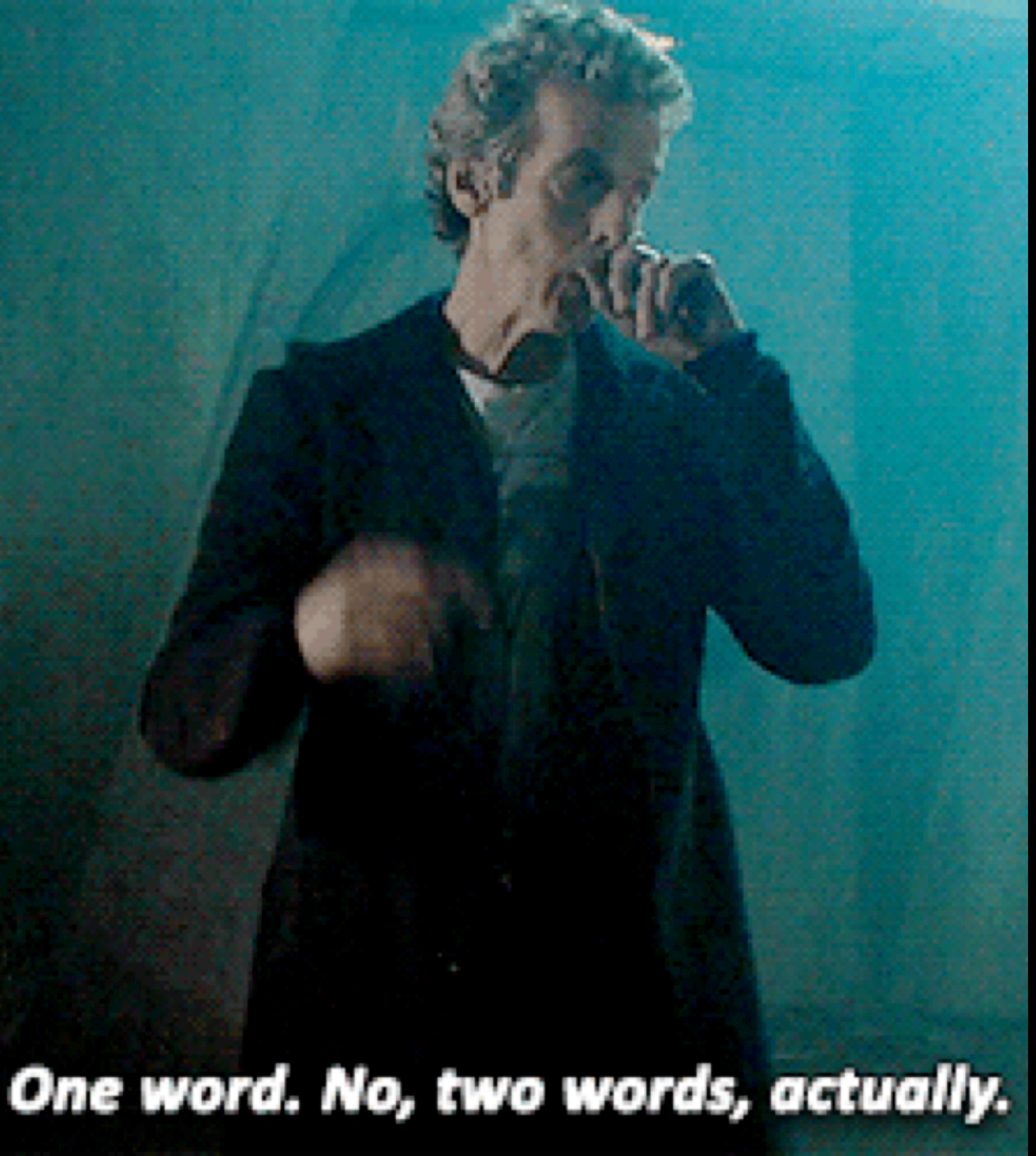
Server handling expected traffic?

Latency higher than normal?

Error rate higher than usual?

metrics comprise a data stream

send the stream to more than one place!



anomaly detection

recap time!

your web apps are backed by something

what's it up to?
how do you know?

get data on what your services are up to

what: monitoring yes/no questions

why: metrics

data changing over time

next: anomaly detection predictions & trends

automate

don't require humans

```
npm install -g npm@latest
```

@ceejbot on all the things

npm loves you