

Microservices at the Heart of BBC iPlayer

Cem Staveley

Software Engineer, BBC

B B C

iPlayer

LIVE



SPORT

The FA Cup

2016/17: Fifth Round Replay: Manchester City v Huddersfield...

BOX SET



DRAMA

Taboo

Full series. Conspiracy, murder, betrayal. With Tom Hardy



COMEDY

This Country

4/6 King of Nerds. Kerry and Kurtan attend a jobs seminar

NEW SERIES



CRIME DRAMA

SS-GB

1/5 In Nazi-occupied London, who can you trust?

TODAY'S

Most Popular

DRAMA

1 EastEnders

28/02/2017

DRAMA

2 The Replacement

Series 1: Episode 1

DOCUMENTARY

3 Stacey Dooley Investig..

Young Sex for Sale in Japan

DRAMA

4 EastEnders

27/02/2017



DOCUMENTARY

OJ: Made In America

1/3 The Oscar-winning story of the trial of the century



CURRENT AFFAIRS

Panorama

Life in Immigration Town



October 2nd

2014

Error 500 - Internal Error

This might be because:

- We are experiencing abnormal traffic to our network or
- the service or servers it is on is not currently available.

Please try the following options instead:

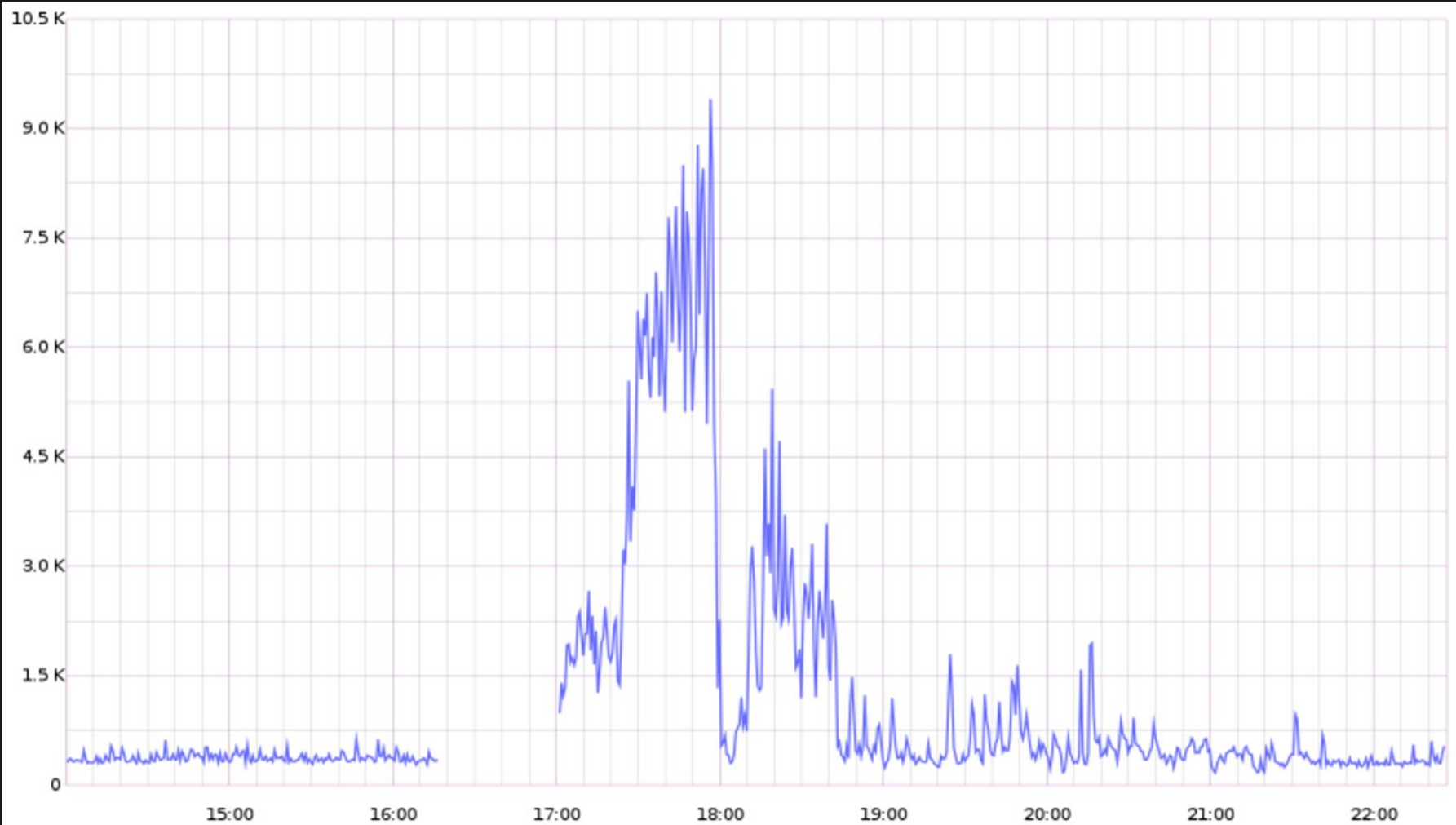
- Try again later once we have solved the problem.
- Use our [site index](#)



[17:23] RobinM Our live boxes seem to be struggling to work through requests

[17:23] RobinM Restarts not helping

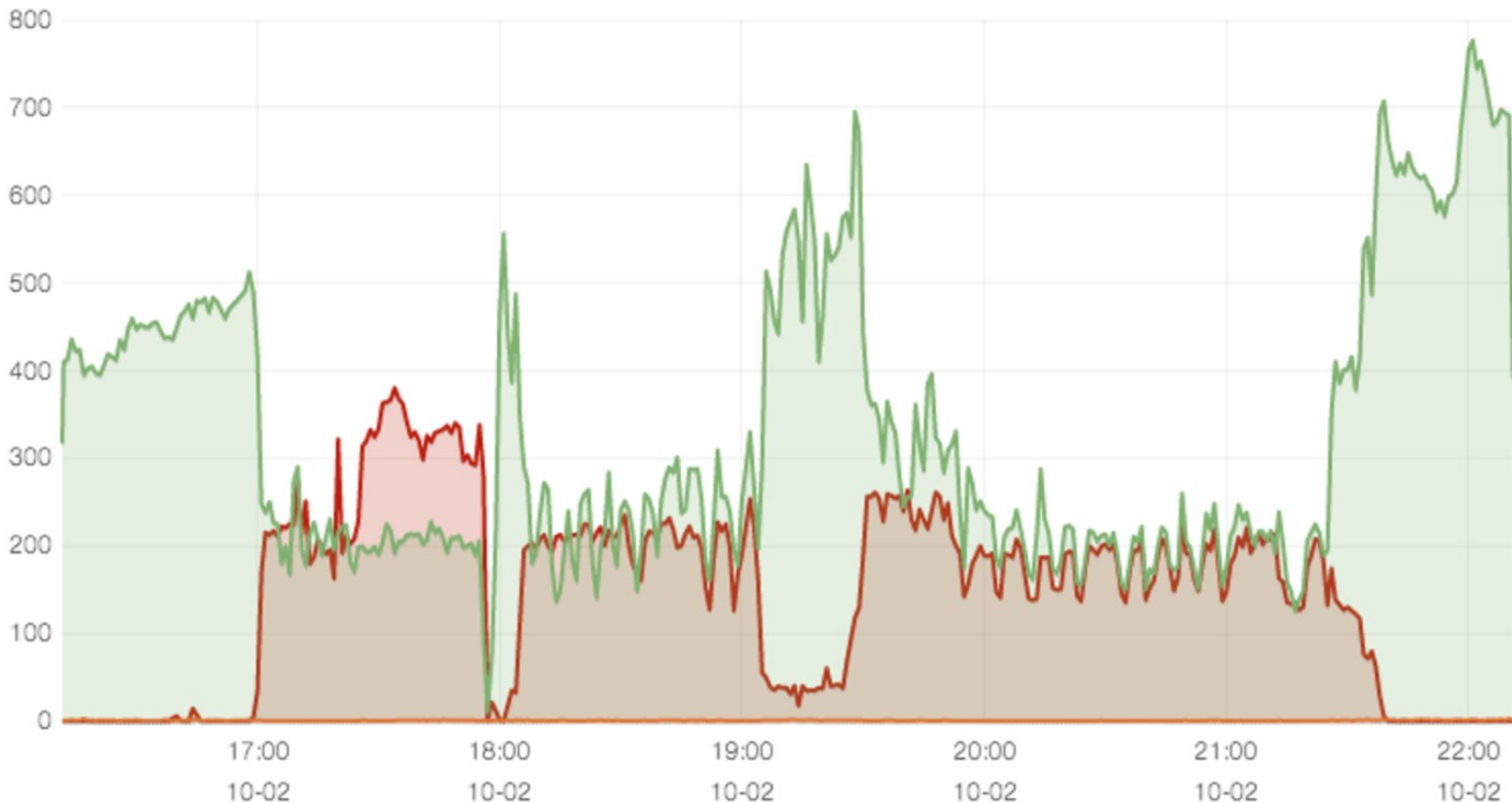
[17:24] RobinM We're scaling up the number of instances now in case it's a load issue



RESPONSES BY STATUS CODE



[View](#) | [Zoom Out](#) | ● 5XX (3156897) ● 200 (7064509) ● 404 (8104) count per 1s | (10229510 hits)



5 hours

the one time I really need iPlayer it goes down... like really?!

23 PM - 2 Oct 2014

2

BBC iPlayer @BBCiPlayer

...mab afraid we're having some technical issu

Follow

Roszie @RosieHodson

iPlayer is down so I decided to search twitter to see if its just me. Turns out everyone wants to do the same. Let me watch Bake Off!

6:41 PM - 2 Oct 2014

Heidi Masters @heidi_masters

...can't catch up on bake off

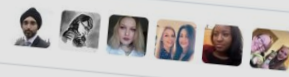
Follow

Great British Bake Off fans distraught as BBC iPlayer goes down due to 'technical problem'

Philippa Perry @Philippa_Perry

"BBC iplayer temporarily unavailable due to a technical error." I WANNA WATCH BAKE OFF NOW. WHAAAAAAH. #weeps

RETWEETS 3 LIKES 4



10:38 AM - 2 Oct 2014

Follow

mol. @molinnit

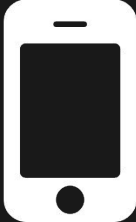
I JUST WANT TO WATCH BAKE OFF BUT IPLAYER IS DOWN I'M SO STRESSED

6:28 PM - 2 Oct 2014

1 3

Follow

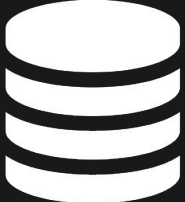
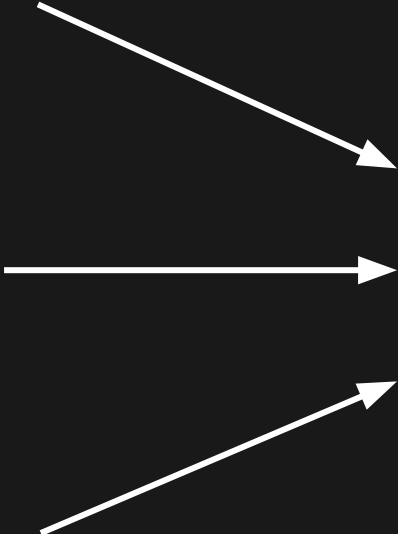
Mobile



Web



TV



iBL
Metadata
API

Fast

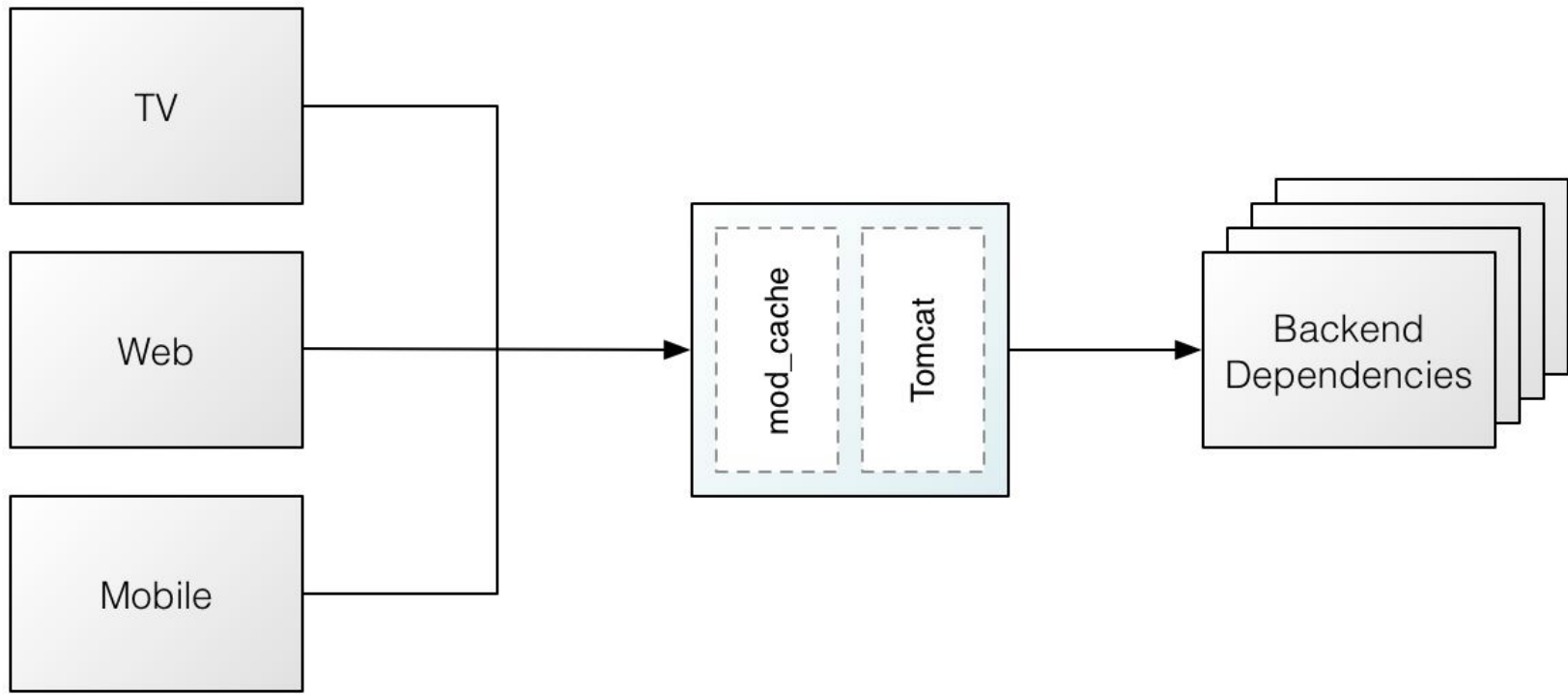
Resilient

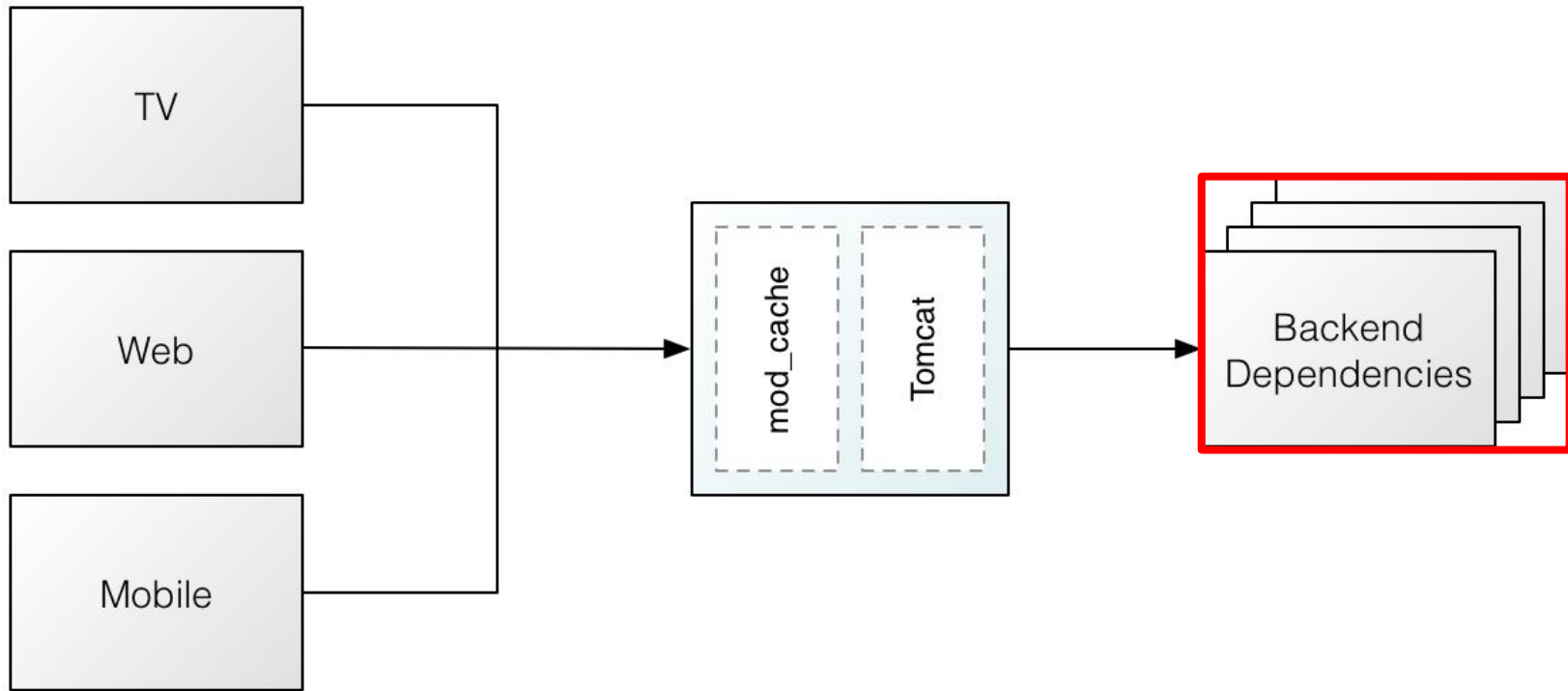
Scalable

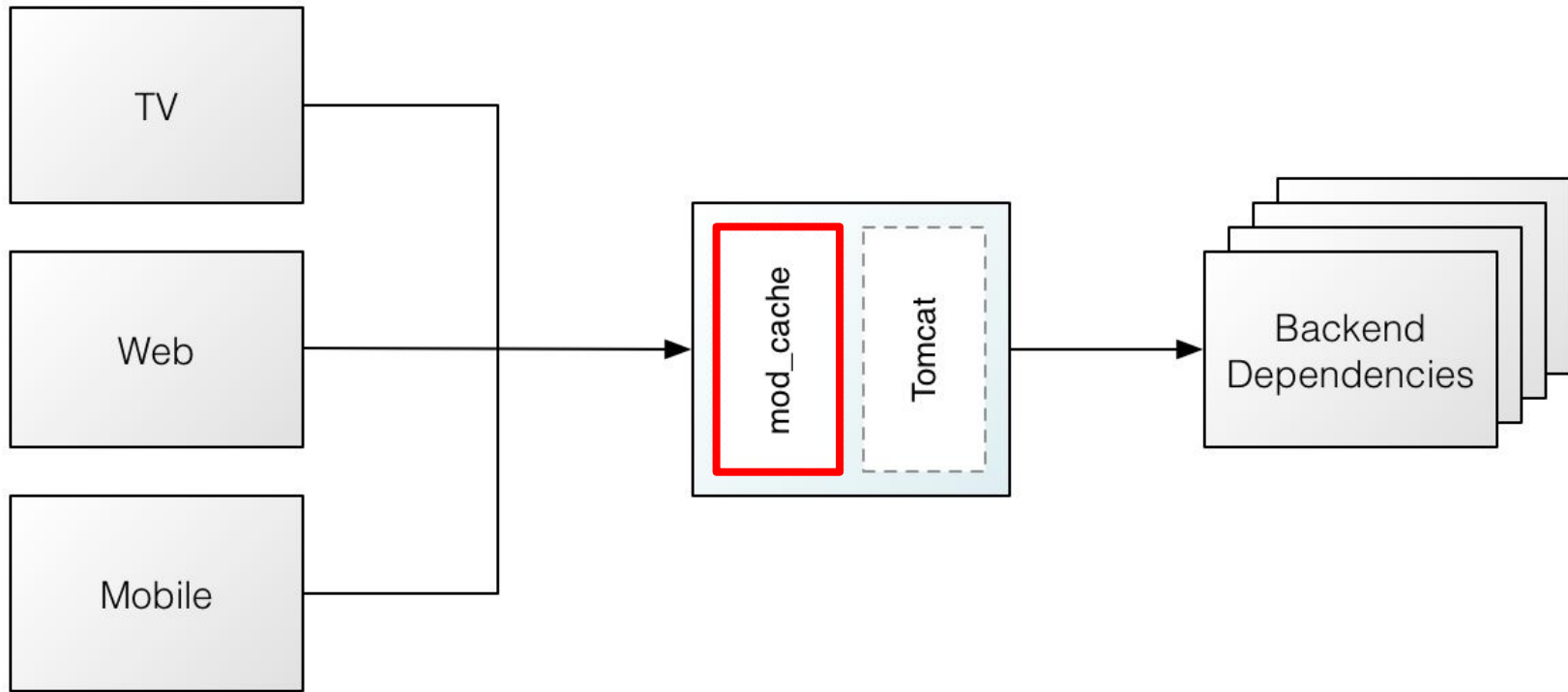
~~Fast~~

~~Resilient~~

~~Scalable~~







Unbalanced Capacities



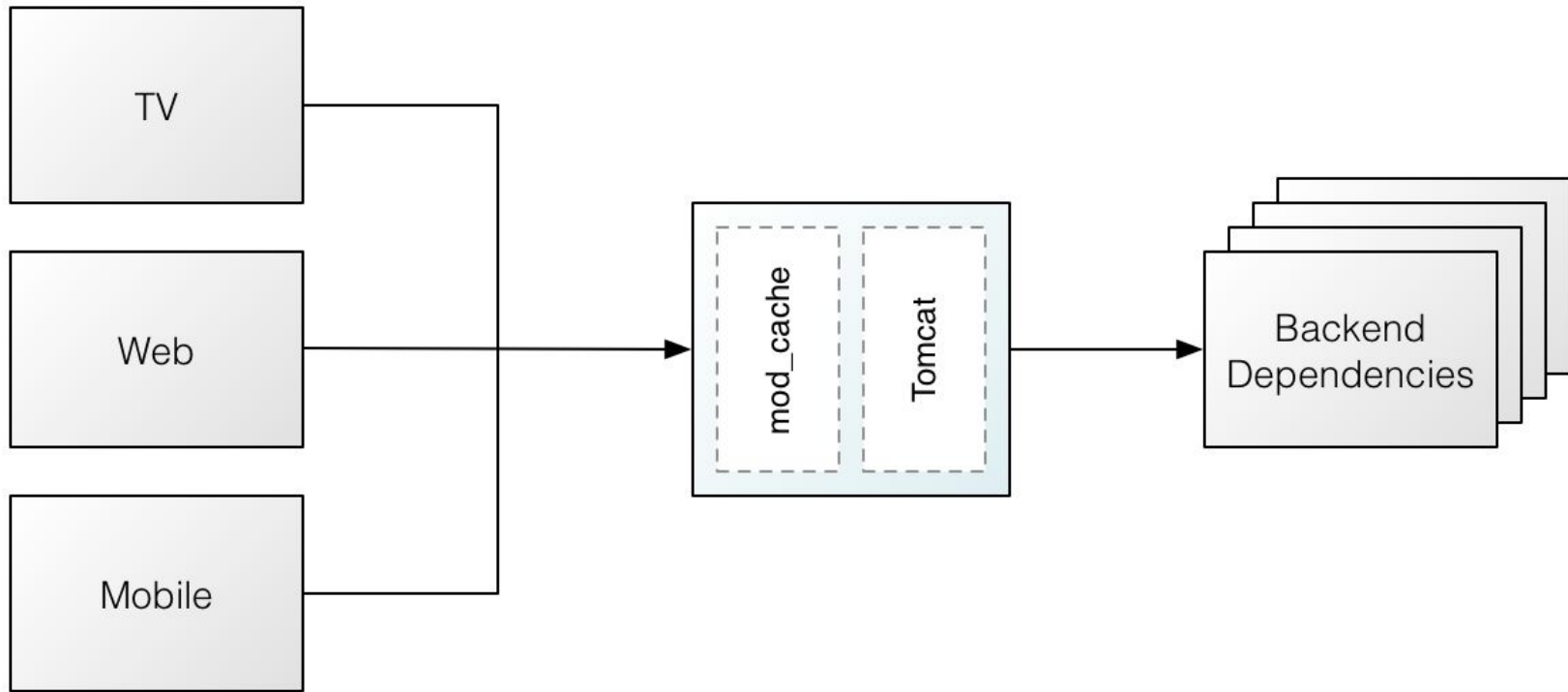
1-5 second response times

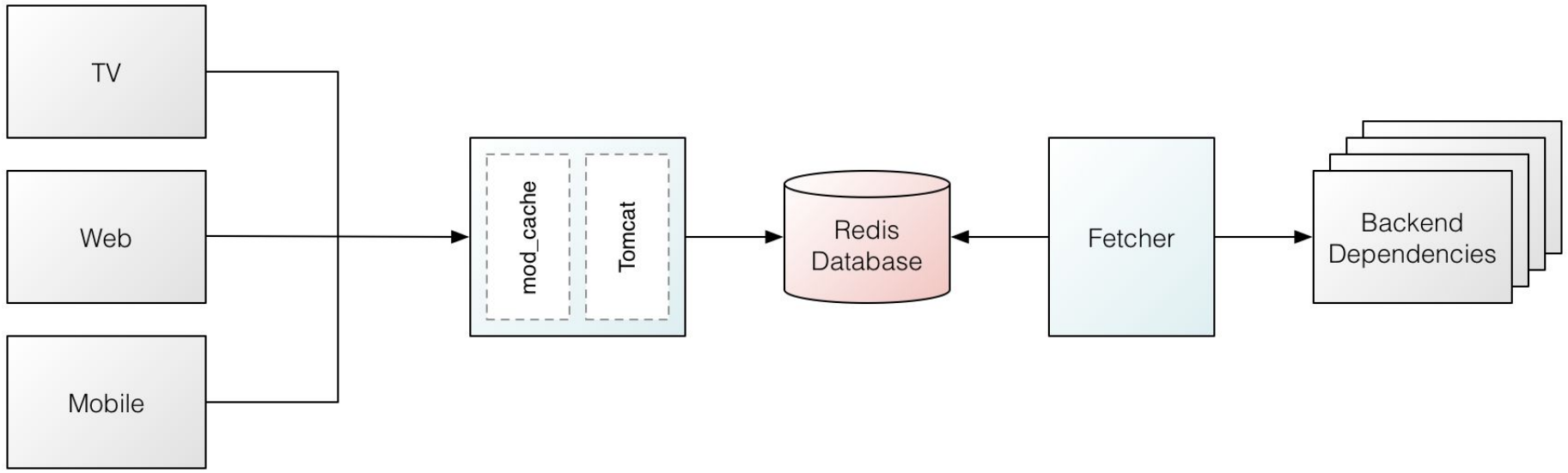
Dependency on HTTP caching

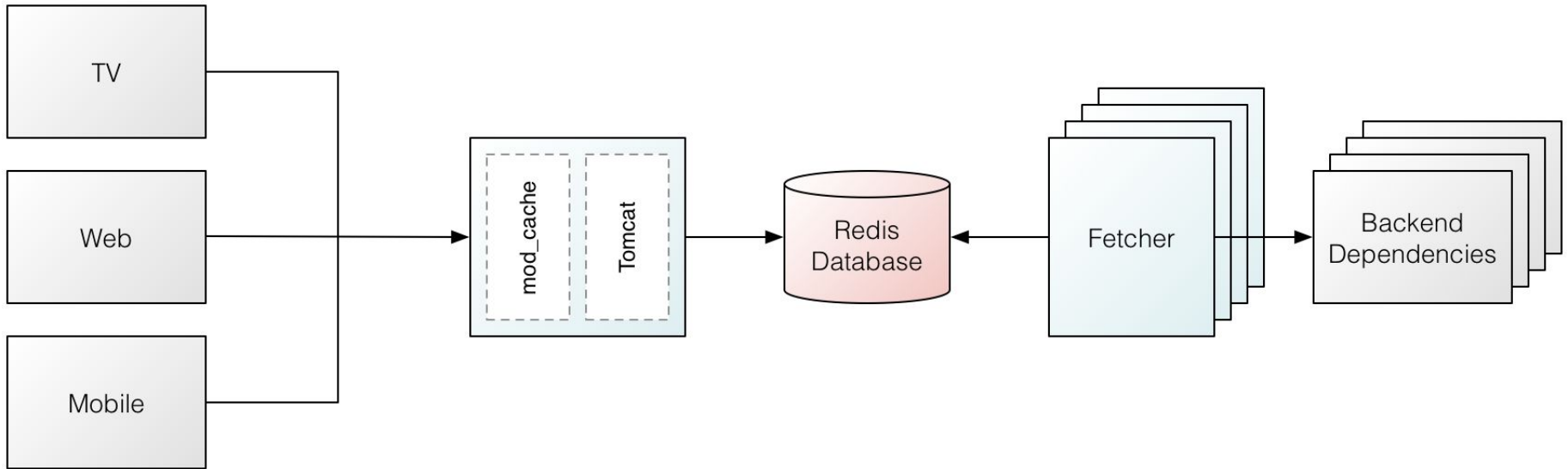
Re-Architect

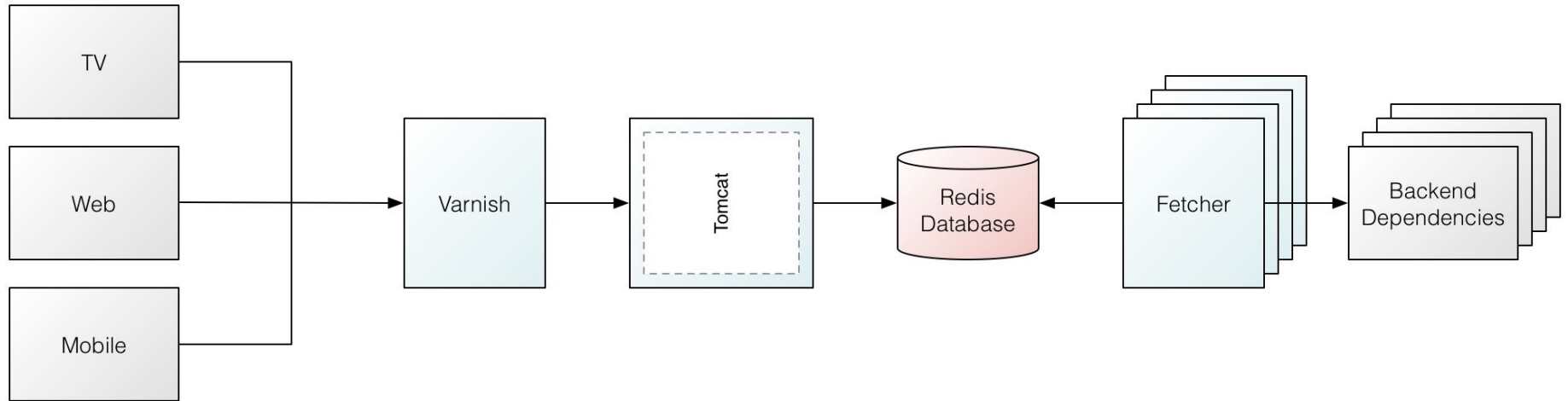
6,500 episodes
1,200 programmes

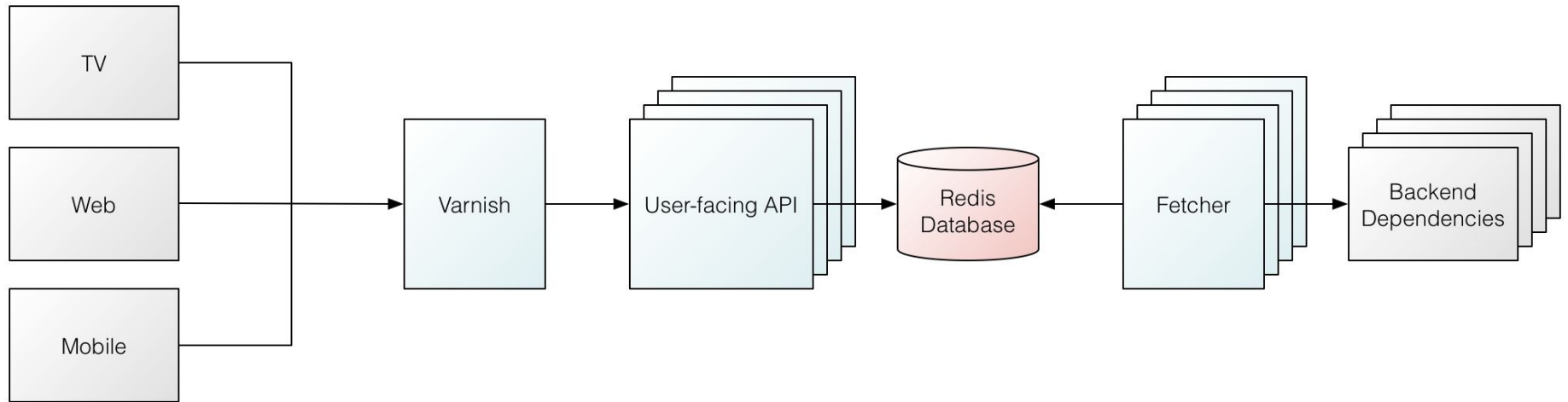
30 days of availability

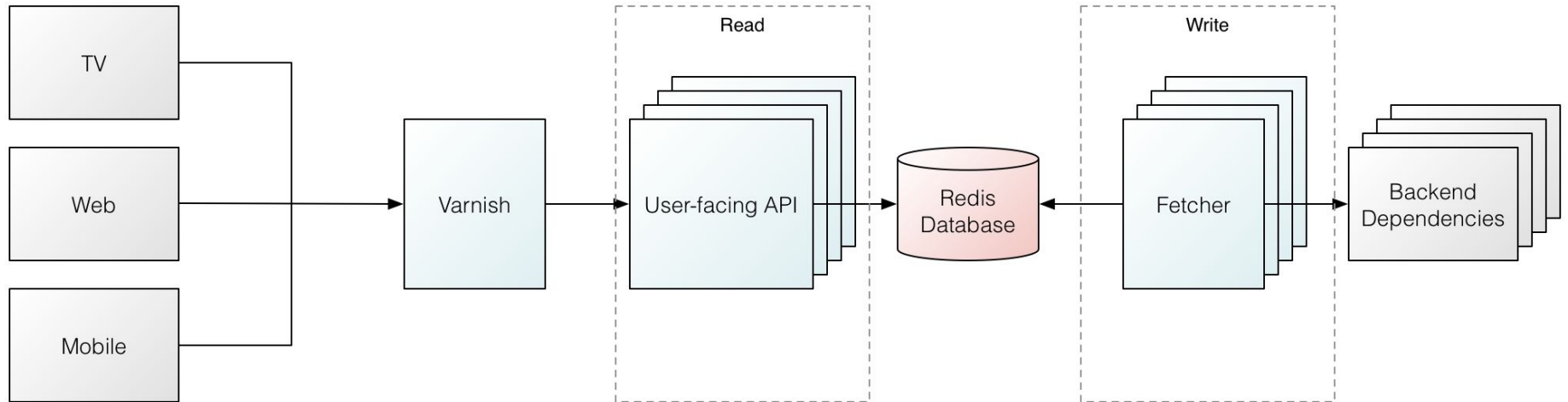














BBC

iPlayer



What went right

Before

5 seconds

After

~10 milliseconds

Independently Deployable
Independently Scalable
Independently Failable

Team Workflow

TDD Pairing



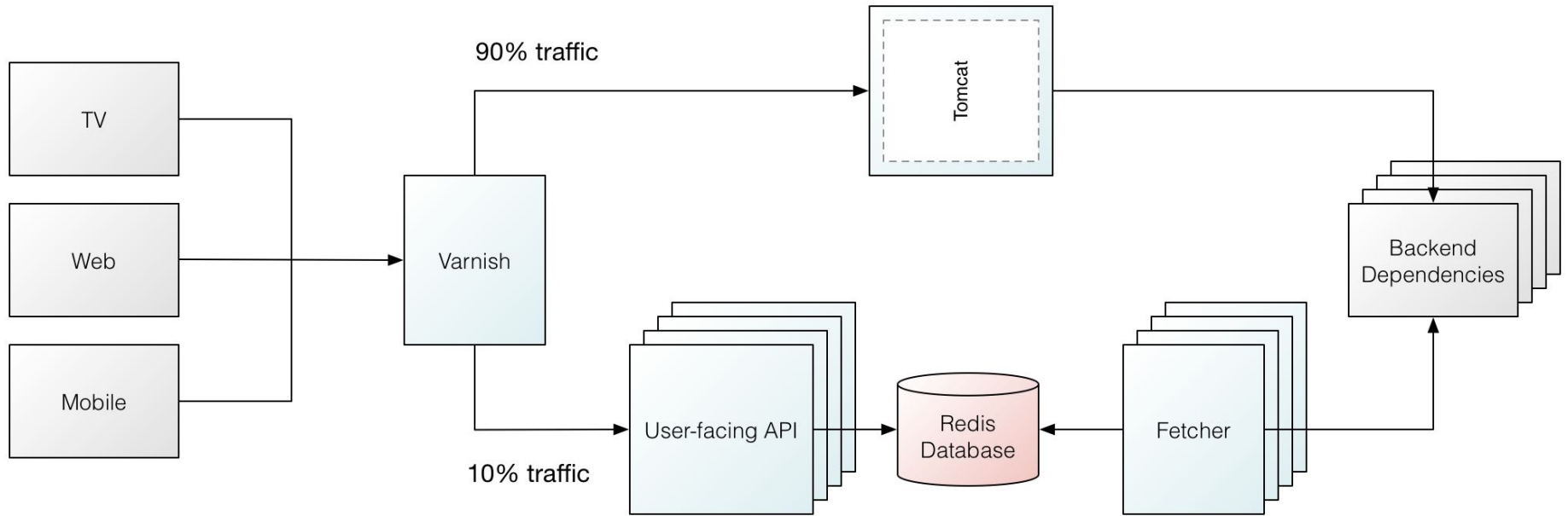
```
'use strict';

const port = process.env.PORT || 7080;

const server = require('@ibl/server').createServer({
  name: 'ibl-user-activity',
  routesFolder: __dirname + '/routes/',
  cacheConfig: require('./config/cache.json'),
  stats: require('@ibl/stats'),
  logger: require('@ibl/logger'),
  accessLogPath: config.get('accessLogPath')
});

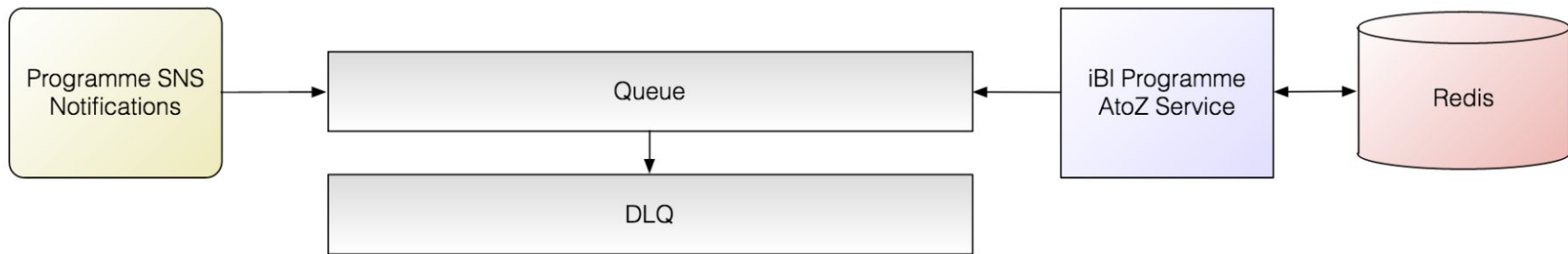
server.useDefaultErrorHandler();

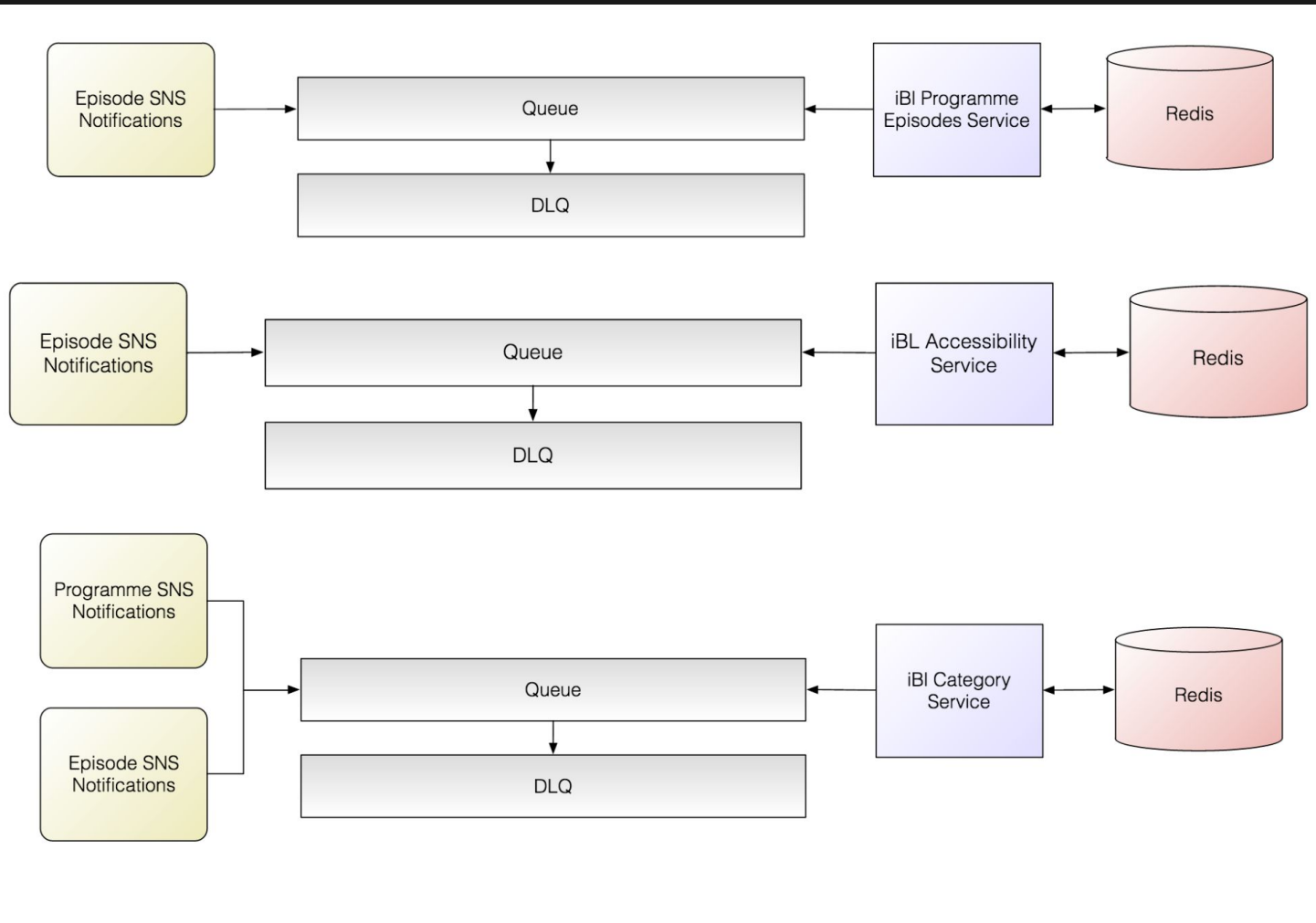
server.listen(port, () => {
  logger.info('Server running at http://127.0.0.1:%d', port);
});
```

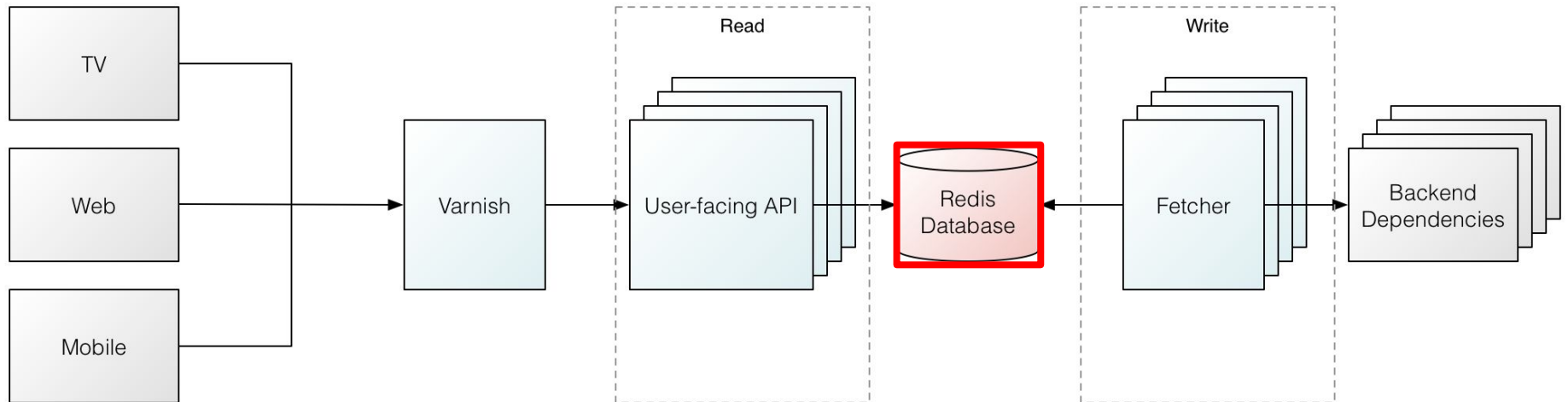


What went wrong

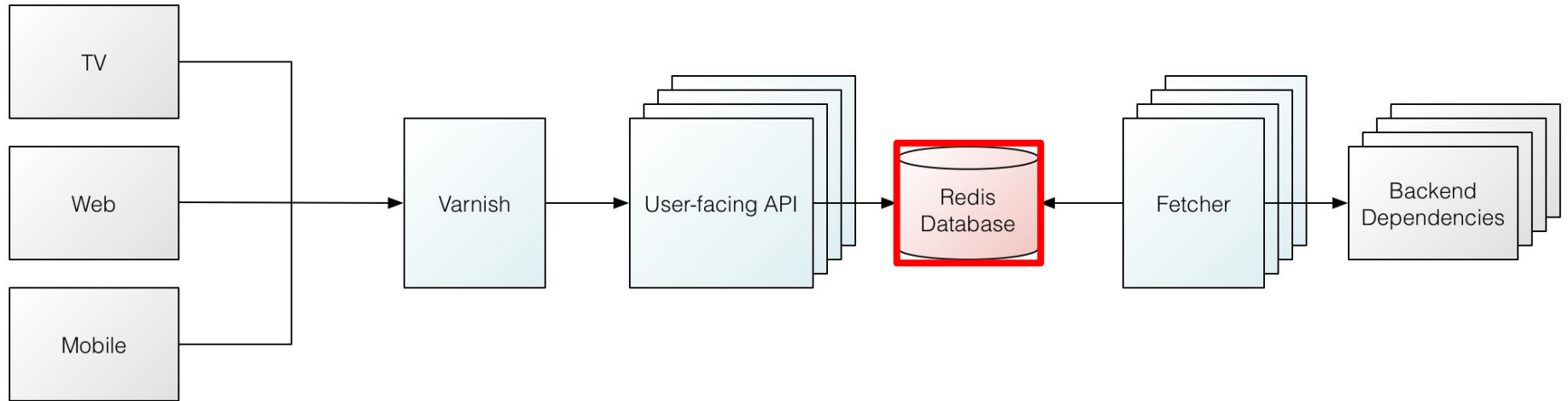
Unnecessary services

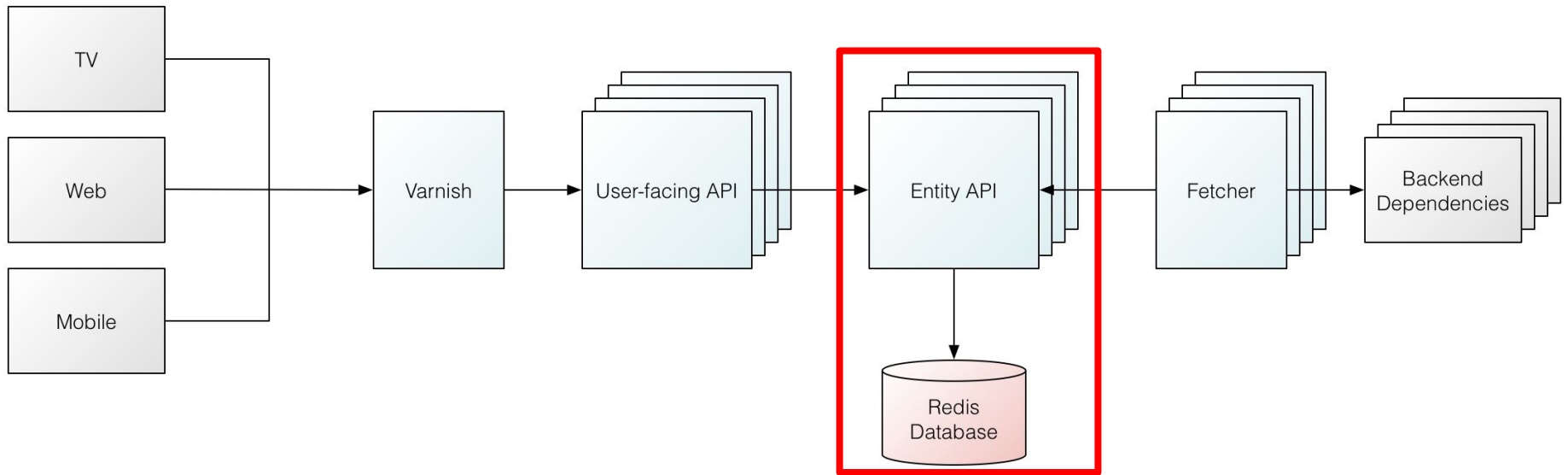


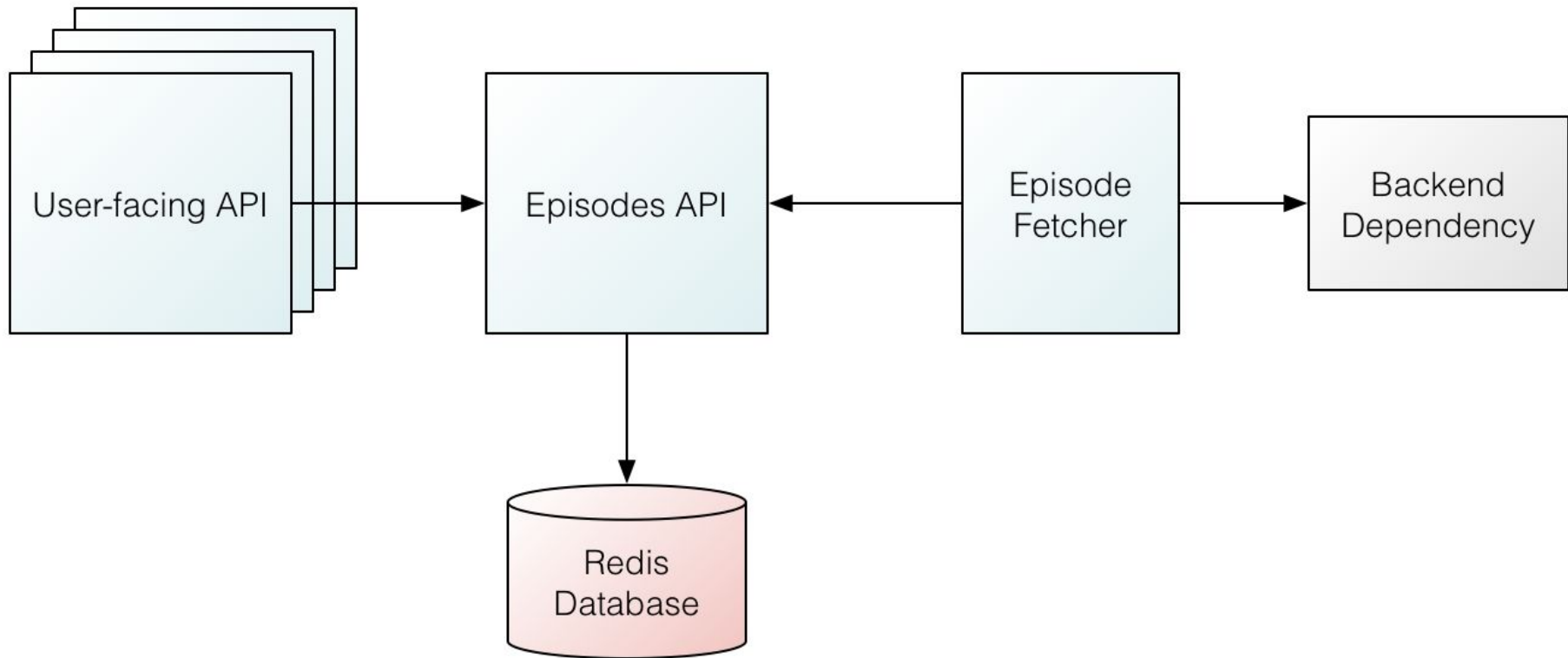


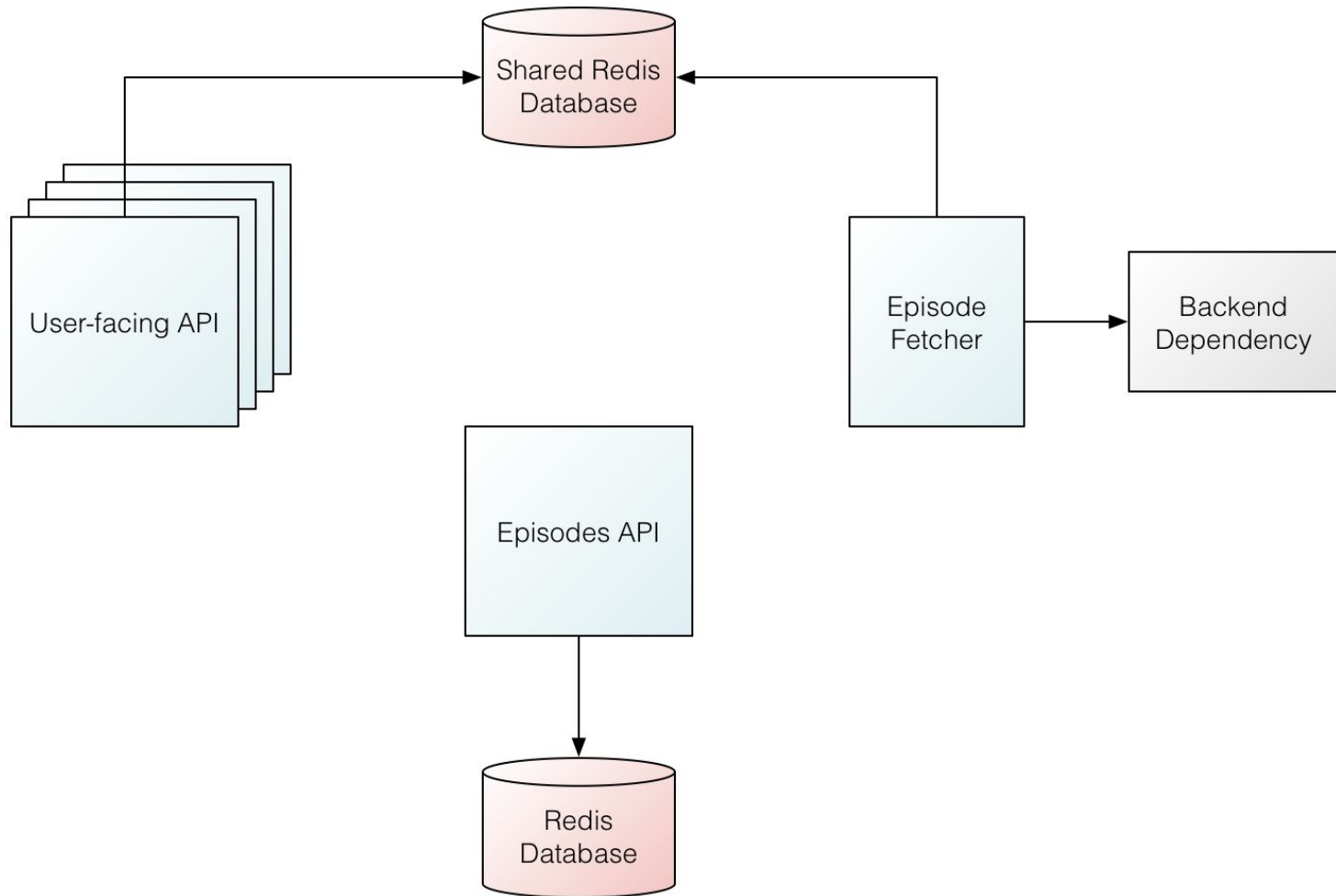


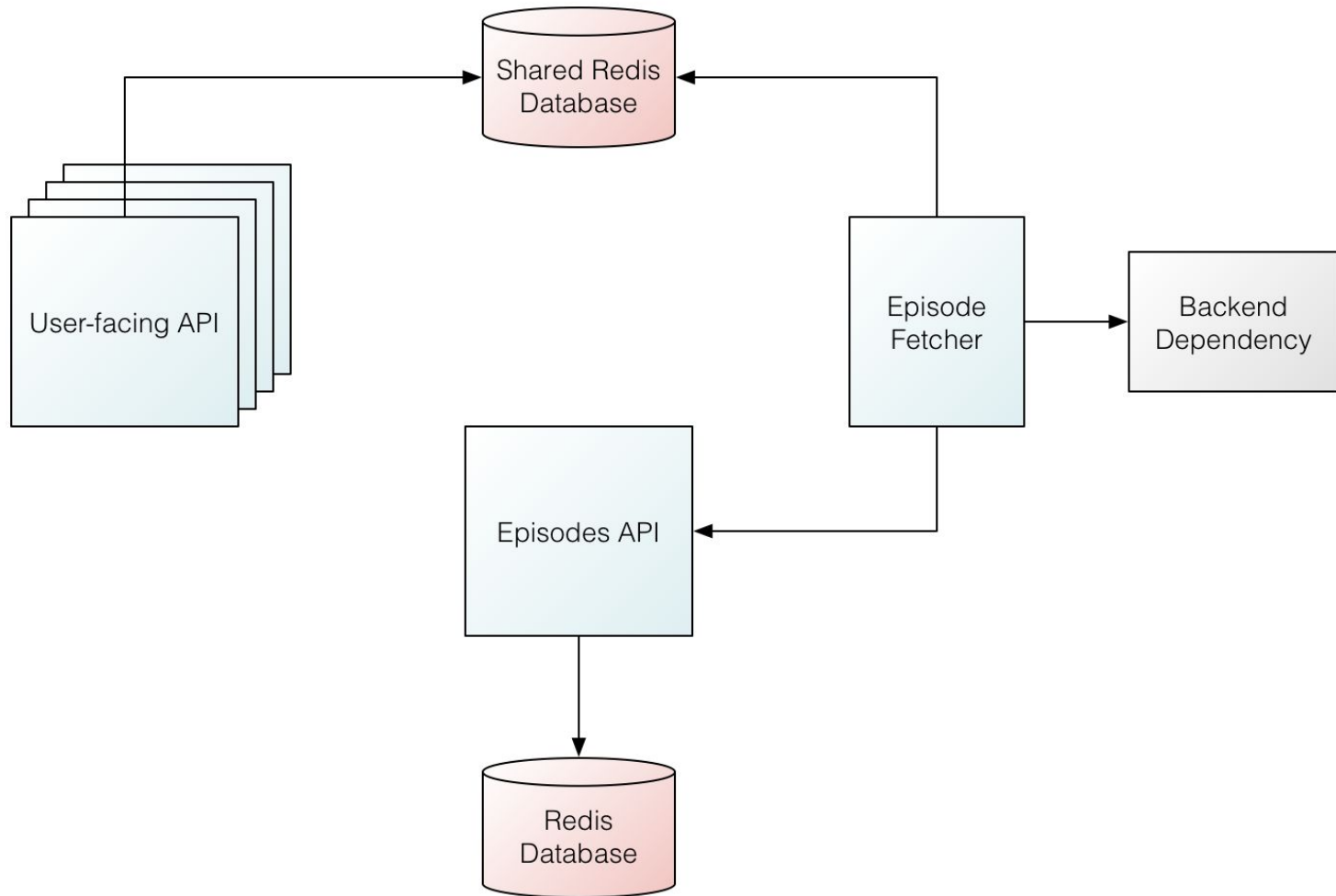
Distributed Monolith

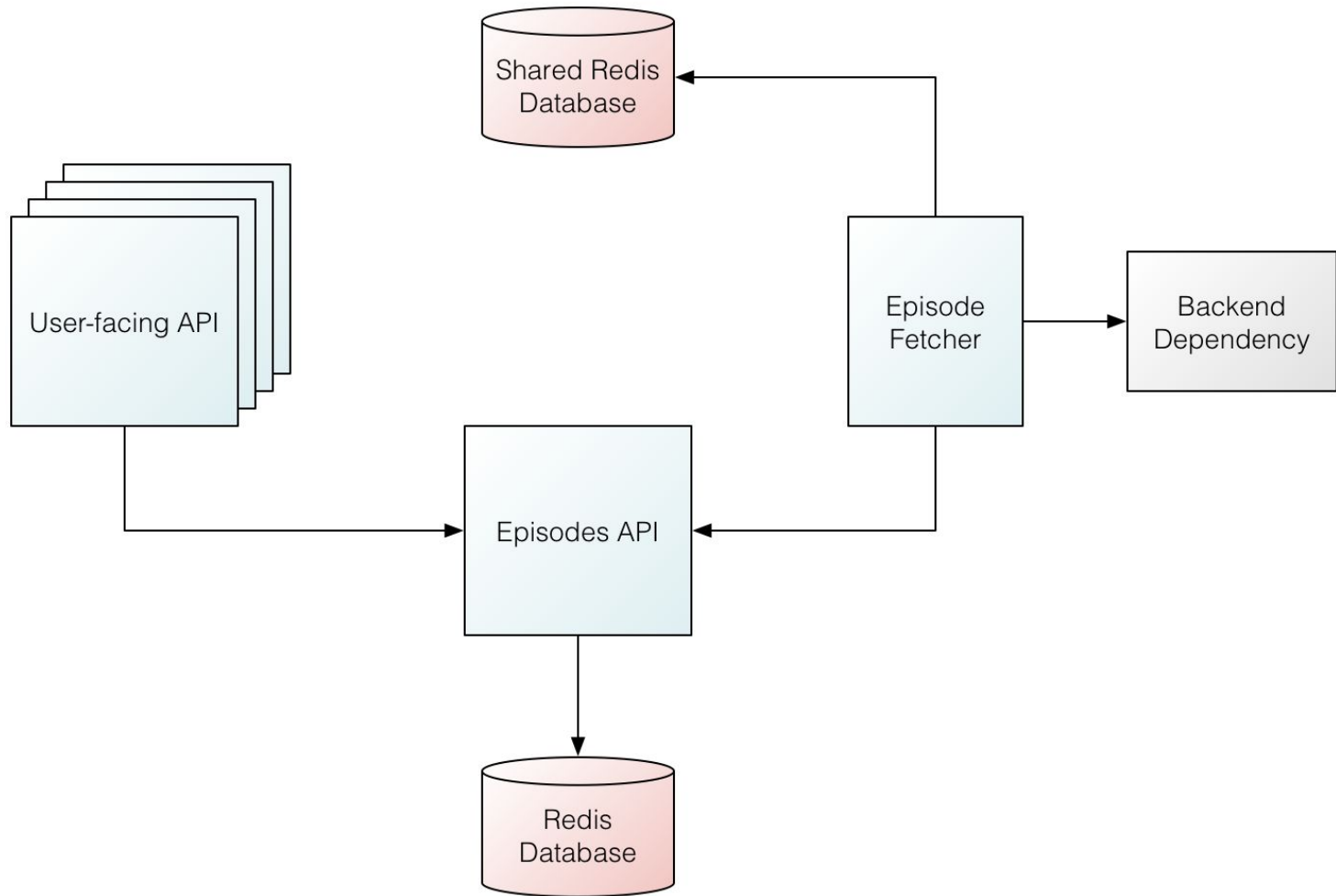


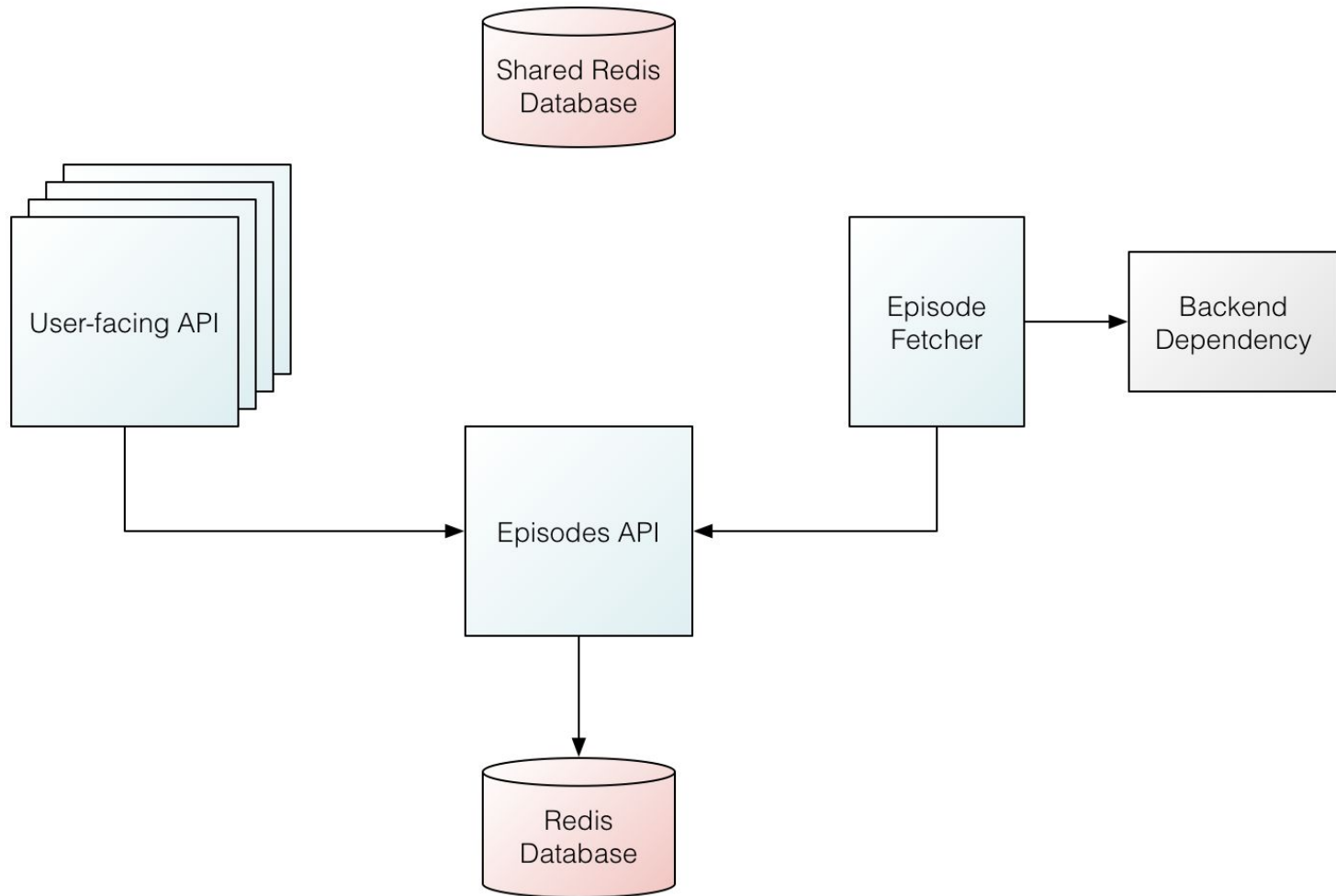












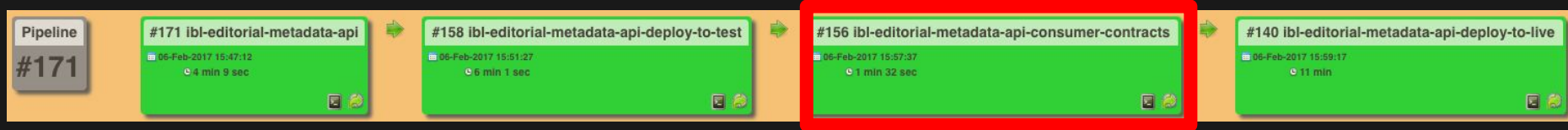
What went right

No more single point of failure

Formalised Data Model

Independently Deployable
Independently Scalable
Independently Failable

Consumer Contracts



bbc/consumer-contracts

```
'use strict';

const config = require('config');

const episodesClient = require('@ibl/episodes-client').createClient({
  host: config.get('episodesAPI.host'),
  stats: require('@ibl/stats'),
  logger: require('@ibl/logger'),
  cacheHost: config.get('cache.host'),
  cachePort: config.get('cache.port')
});

episodesClient.get('episodeId', (err, episode) => {
  if (err) return cb(err);

  console.log(episode);

  // { "id": "episodeId", ... }
});
```



Yeoman

```
workspace|= yo @ibl/api
```



```
Welcome to the iBL Node  
API generator! There's  
always money in the  
banana stand.
```

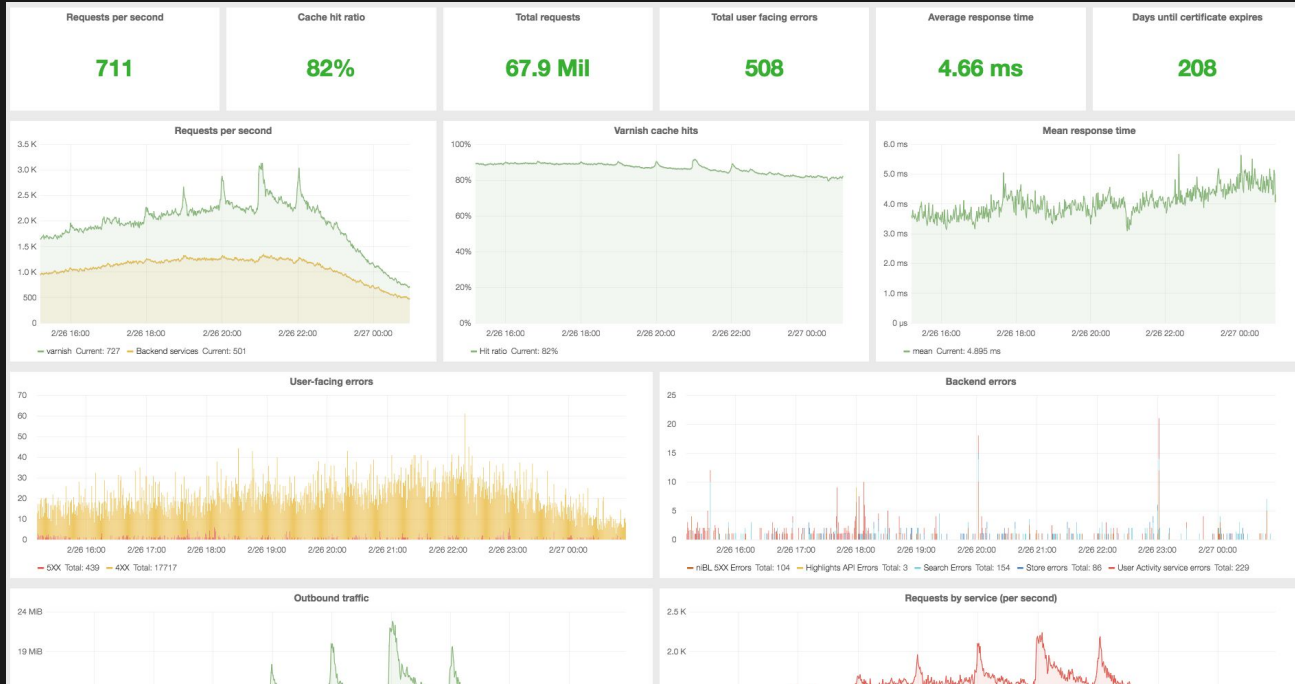
```
? What is your service's name? ibl-new-api  
? Provide a short description for your service: A new entity API  
? What should the StatsD prefix be? bbc.ibl.api  
? What should the CNAME entry be? new.api.bbc.co.uk  
? What is your GitHub repository? bbc/ibl-new-api  
? Would you like me to Create a Cosmos component for you? No  
create package.json  
create .eslintignore  
create .jsbeautifyrc  
create .gitignore  
create server.js  
create config/cache.json  
create lib/href.js  
create test/routes/status.js  
create test/routes/index.js  
create public/favicon.ico  
create project.json  
create README.md  
create index.js  
create config/default.json  
create config/dev.json  
create config/test.json  
create config/live.json  
create routes/status.js  
create routes/index.js  
create bake-scripts/create-node-opts.js  
create bake-scripts/remove-crl-cron.sh  
create infrastructure/component.json  
create infrastructure/dns.json  
create infrastructure/.cosmos  
create test/mocha.opts  
create docs/index.md
```

Shared HTTP Cache



Caching
Logging
Stats
Circuit Breaking
Rate Limiting

[bbc/flashheart](https://github.com/bbc/flashheart)



StatsD Graphite Grafana

Checks in an unhealthy state

No checks in an unhealthy state

Recent alerts

Timestamp	Time ago	Name	Value	Warn	Error	From	To
2017-03-01 22:43:18	15 hours ago	iBL Groups API 5XX errors	0	5	15	WARN	OK
2017-03-01 22:42:17	15 hours ago	iBL Groups API 5XX errors	10.666666666666666	5	15	WARN	WARN
2017-03-01 22:41:18	15 hours ago	iBL Groups API 5XX errors	10.666666666666666	5	15	OK	WARN
2017-03-01 20:37:18	17 hours ago	iCS Lists Service 5XX	0.3	0.5	5	WARN	OK
2017-03-01 20:36:18	18 hours ago	iCS Lists Service 5XX	0.5	0.5	5	OK	WARN
2017-03-01 10:14:19	a day ago	Master Brands Fetcher Failures	0	1	3	WARN	OK
2017-03-01 10:13:19	a day ago	Master Brands Fetcher Failures	1	1	3	WARN	WARN
2017-03-01 10:12:20	a day ago	Master Brands Fetcher Failures	1	1	3	WARN	WARN
2017-03-01 10:11:20	a day ago	Master Brands Fetcher Failures	1	1	3	WARN	WARN
2017-03-01 10:10:20	a day ago	Master Brands Fetcher Failures	1	1	3	WARN	WARN

Seyren

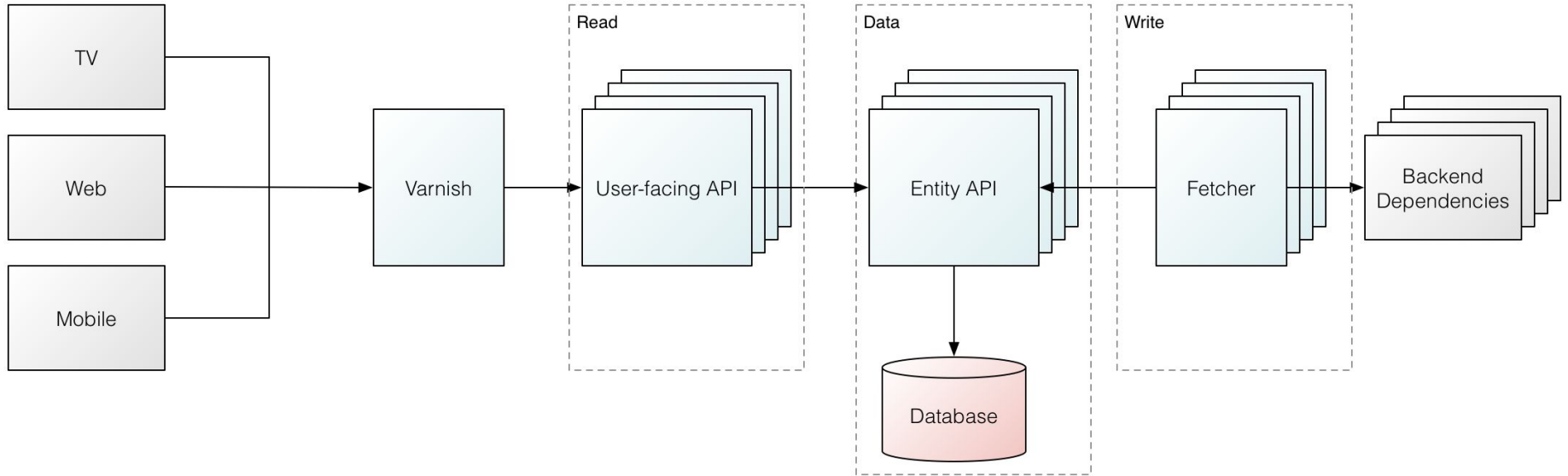
What went wrong

HTTPS and Keep-Alive

Deleted the database too early

Whoops!

Where we are now







redis



elastic



graphite



Varnish
StatsD
CollectD

Thank You

Cem.Staveley@bbc.co.uk