Production Debugging in AWS ElasticBeanstalk

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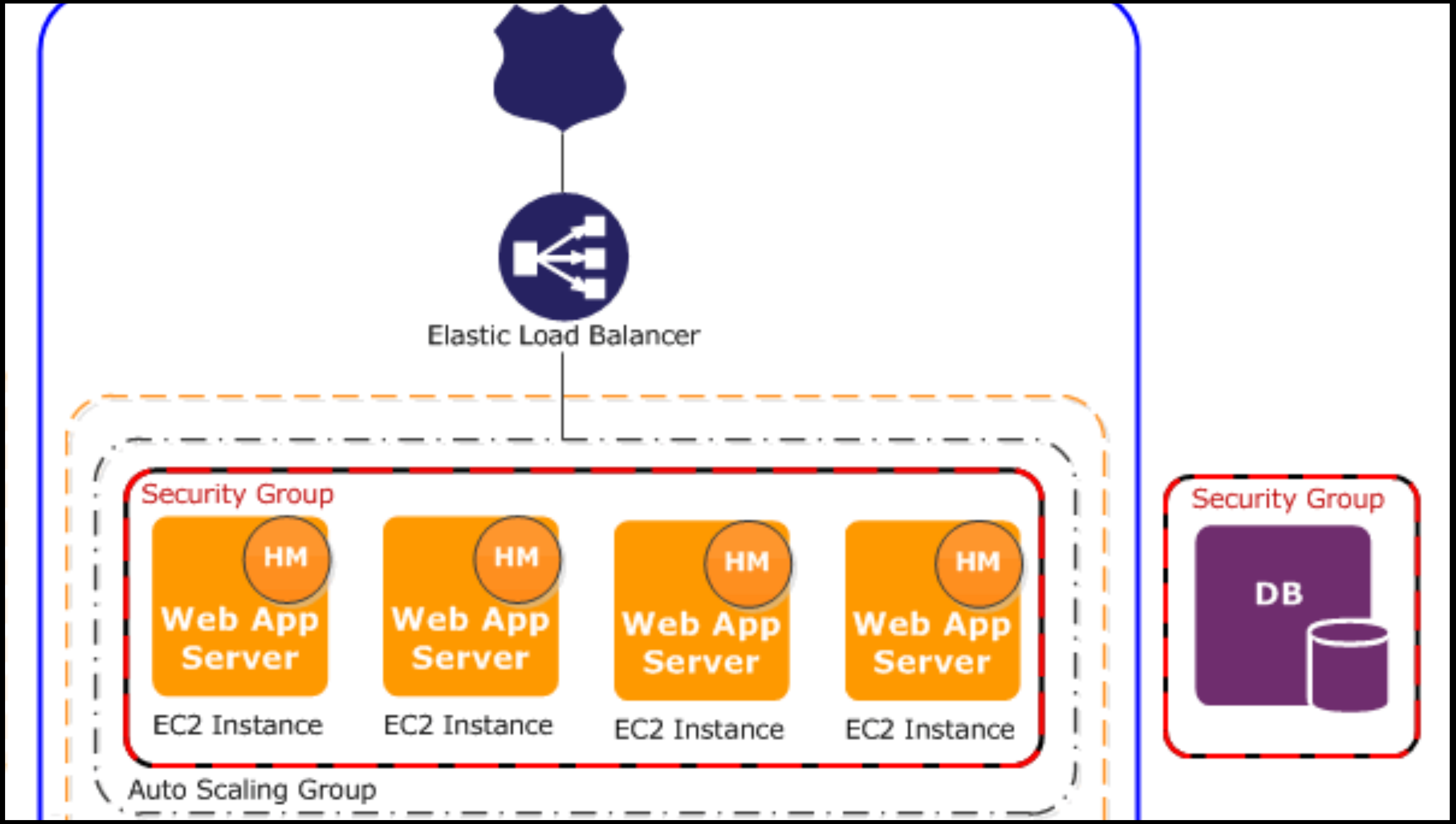
Talk Goals

- Touch on some AWS technologies
- Operation of a system versus development
- Touch on web and rails debugging

AWS ElasticBeanstalk Architecture



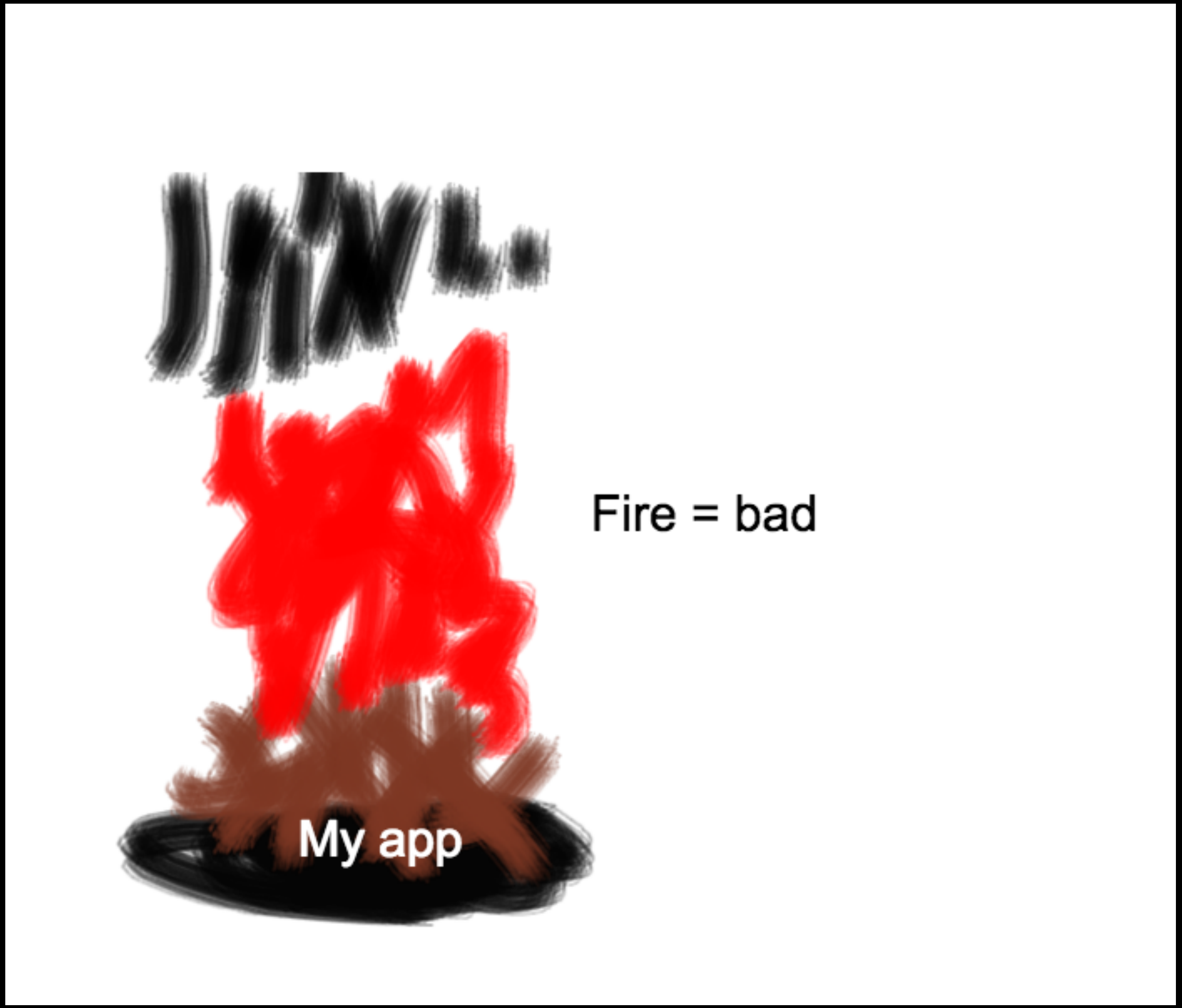
Application Design

- Two Ruby on Rails apps (hosted with EB)
- JSON API secured by HTTPS and HTTP basic authentication
  - We'll talk about this later

'Simple' problem

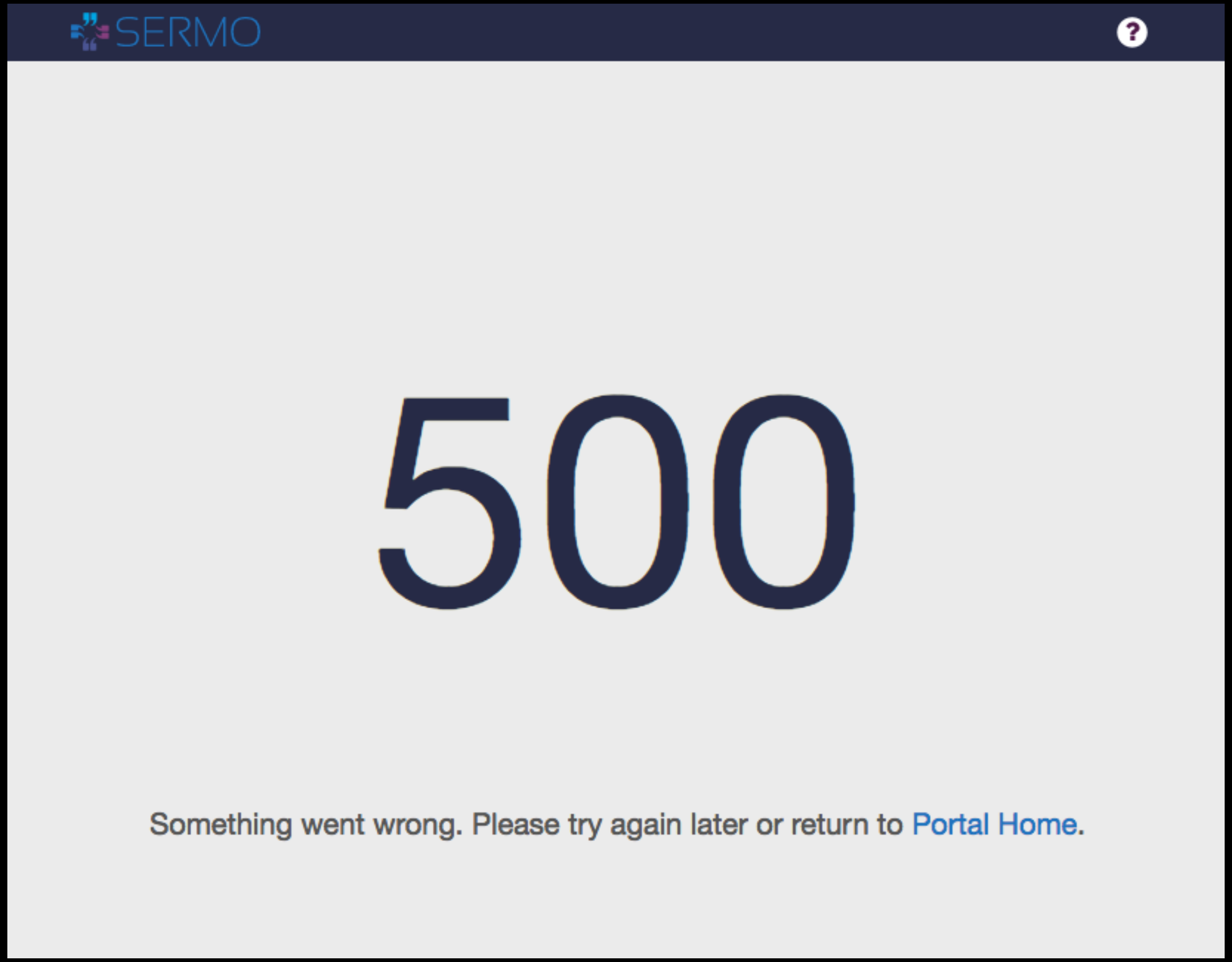
Smoke testing the app before releasing it to users resulted in a lot of smoke.

Lit AF is somehow not good



Symptoms

Log in. Go to projects. User see '500' page:



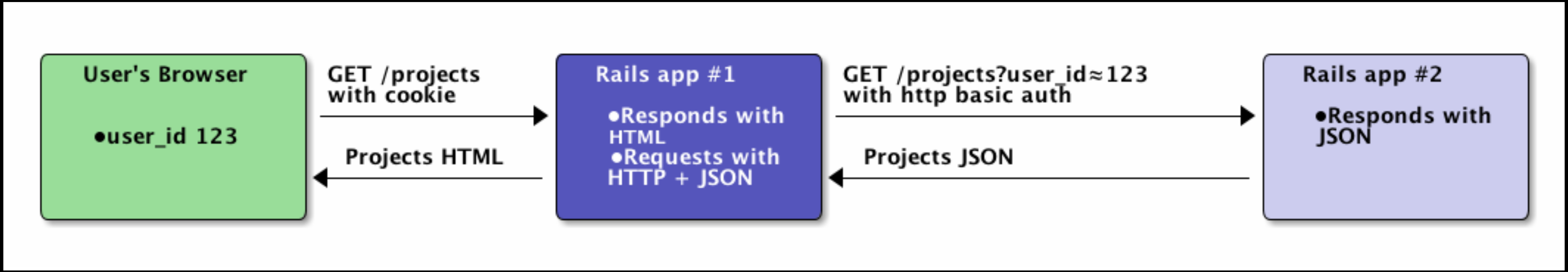
SERMO

500

Something went wrong. Please try again later or return to Portal Home.

Request flow

Mental model is critical for debugging!



Common Tools

- SSH for logging in
- Rails and nginx logs for history
- Rails console to interact with the app
- curl to easily replay requests

Debugging

- Recreating the error
- Exception tracker
- Logs

Exception tracker

Caveat: some classes of exceptions are completely ignored.

Exception tracker clients (`gem sentry-raven`) have default lists.

Logs

Caveat: logs don't have all data you could want.

Rule: logs will always lack the specific data you need at that point in time.

Example: *usernames and passwords*

Log Locations

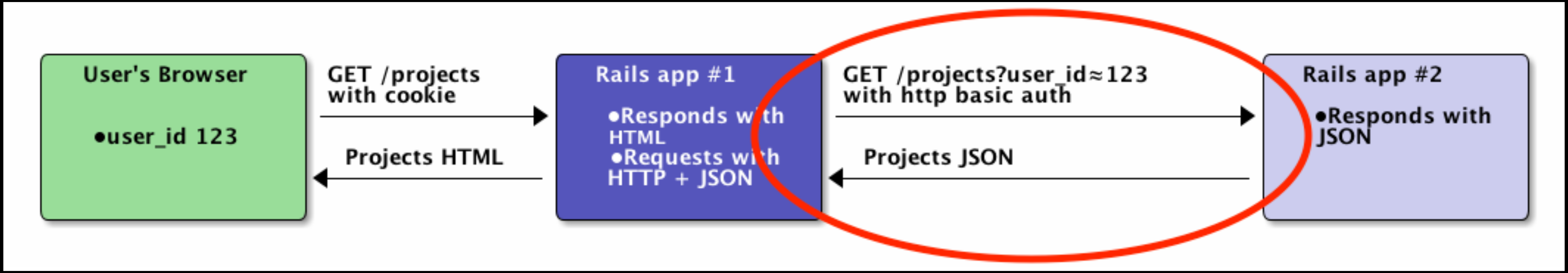
AWS ElasticBeanstalk default 'interesting' log locations:

- Rails: `/var/app/current/log`
- NGINX: `/var/log/nginx`
- Puma: `/var/log/puma`

Exception that was raised

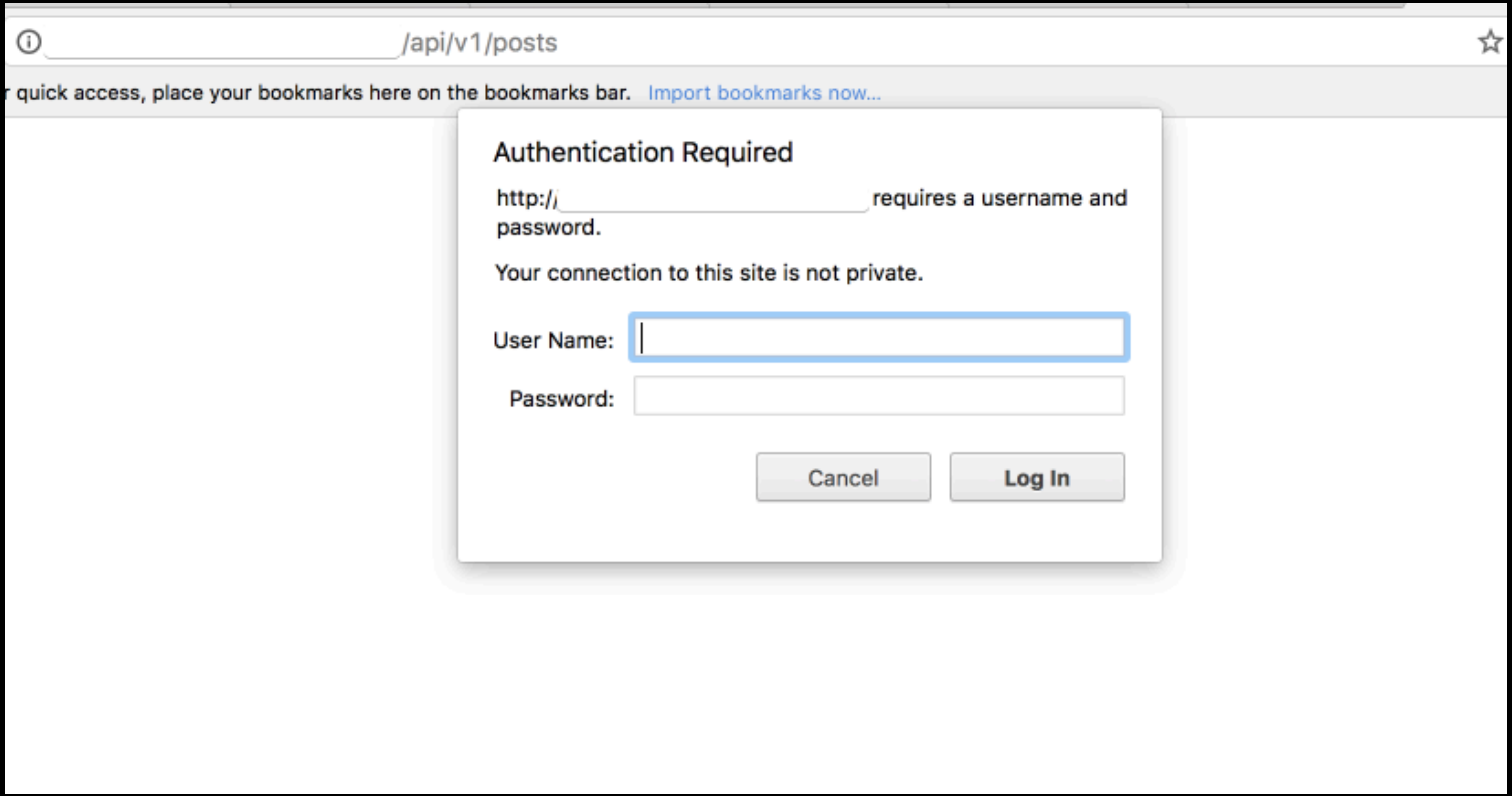
Class: `JsonApiClient::Errors::NotAuthorized`

Where from: `json_api_client` gem.



HTTP 401 Unauthorized

HTTP Basic Authentication



/api/v1/posts

quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...

Authentication Required

http:// requires a username and password.

Your connection to this site is not private.

User Name:

Password:

HTTP Basic Authentication (cont.)

Username and password are base64 encoded like this:

```
Base64.encode64(username + ':' + password)
```

In JavaScript: `btoa(username + ':' + password)`

HTTP Basic Authentication (cont.)

Username: `Aladdin`

Password: `OpenSesame`

HTTP header generated:

```
Authorization: Basic QWxhZGRpbjpPcGVuU2VzYW1l
```

Test with alternative methods!

Using `curl` to test makes reproducing this much easier to reproduce.

See `-u, --user <user:password>` in `man curl`

`curl`ing works, wtf?

Investigate other server

Dead end. Logs in Rails and NGINX don't have full credentials logged by default.

We also already know that it works!

Investigate the header

How do we set the header in our code? Like this:

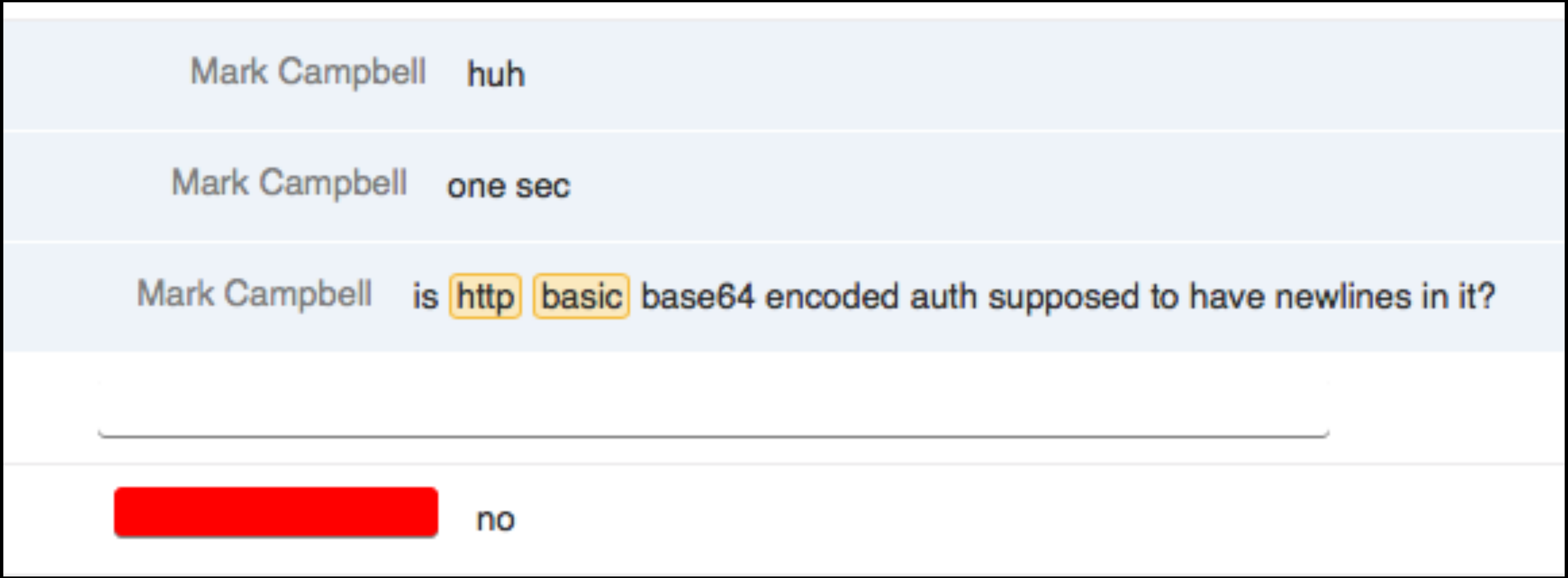
```
connection_options[:headers] = {
  'Authorization' => "Basic #{Base64.encode64(API_KEY + ':' + PASSWORD)}"
}
```

Spot the bug

```
irb(main):003:0> Base64.encode64('mysecretusername:TXlTZWNyZXRVc2VybmFt...')

=> "TEZ4OVJvSi9tc3R3V3BodXpUanNkTFFlTURheFJvcmtBTExCYVdOTUZSeFFw\nUlJSR3NUVW
55WGZwTENqYnFqVzpUWGxUWldOeVpYUlZjMlZ5Ym1GdFpUcE1S\nbmc1VW05S0wyMXpkSGRYY0do
MWVsUnFjMlJNVVdWTlJHRjRVbTl5YTBGTVRF\nSmhWMDVOUmxKNFVYQlNVbEpIYzFSVmJubFlabk
JNUTJwaWNXcFg=\n"
```

Realization



Mark Campbell huh

Mark Campbell one sec

Mark Campbell is http basic base64 encoded auth supposed to have newlines in it?

[redacted] no

Fix

```
Base64.strict_encode64('mysecretusername:TXlTZWNyZXRVc2VybmFt...')
```

Smoke test!

Checklists

Operation of a system is very complex.

Without a checklist, you're going to miss something.

New systems, feature, and bugs should have checklists!

Lessons learned

- Checklist before system is operational
- Smoke tests are great
- Reproduce the error as simply as possible
- Mental models are critical

The end.
Any Questions?