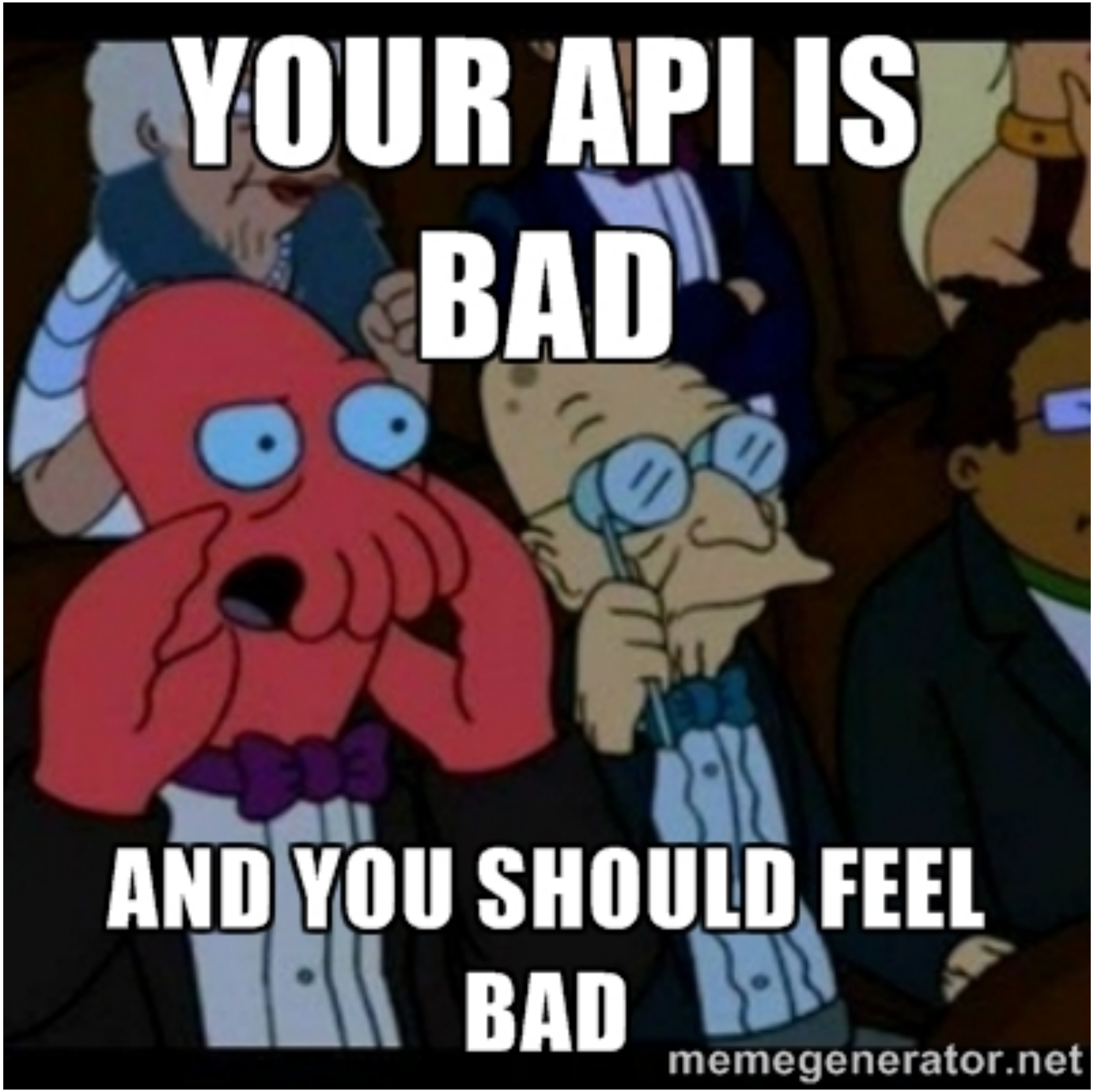

YOUR API IS BAD
AND YOU SHOULD FEEL BAD
memegenerator.net

Who is this guy?

Ben Edmunds

Open Source
Author
PHP Town Hall Podcast
CTO at Mindfulware

Who is this guy?

Ben Edmunds

@benedmunds
http://benedmunds.com

What Will We Cover?

Slim PHP Framework

RESTful API Basics

API Design

Implementing your API

Versioning, Auth, & Rate Limiting

Slim PHP

Simple

Similar to Sinatra

FastRoute

Testable

Workshop

WALKTHROUGH 1

RESTful API Basics

What is REST?

Representational **S**tate **T**ransfer

HTTP Methods

GET, POST, PUT, PATCH, DELETE

Expressive

Real-World Usage

What is REST?

Formats

JSON*

XML

Anything

What is REST?

Most widely used data format is JSON

Javascript **O**bject **N**otation

```
{
  key:  ‘value’,
  anotherKey: ‘value2’
}
```

What is REST?

JSON usage in Javascript = familiar

```
var object = {
  key: ‘value’,
  anotherKey:‘value2’
};
```

What is REST?

JSON encoding is supported natively in most languages

PHP

```
echo json_encode(array(
    ‘key’ => ‘value’
));
```

Outputs

```
{key:‘value’}
```

What is REST?

JSON decoding is just as simple

PHP

```
$json_data = “{key:‘value’}”;
print_r(json_decode($json_data));
```

Outputs

```
array(
    ‘key’ => ‘value’
)
```

Warning
This will be Opinionated

API Design

Simple

Expressive

Intuitive

API Design

Simple

Expressive

Intuitive

STABLE

API Design

Simple

Expressive

Intuitive

STABLE

CONSISTENT

API Design

Use the Facebook API

DO THE OPPOSITE

API Design

Document!

Document!

Document!

API Design

To ADD or not to ADD

API
Driven
Development

API Design

HTTP Status Codes

HTTP Status Cats
to the Rescue!

API Design

Status 2xx = Success

API Design

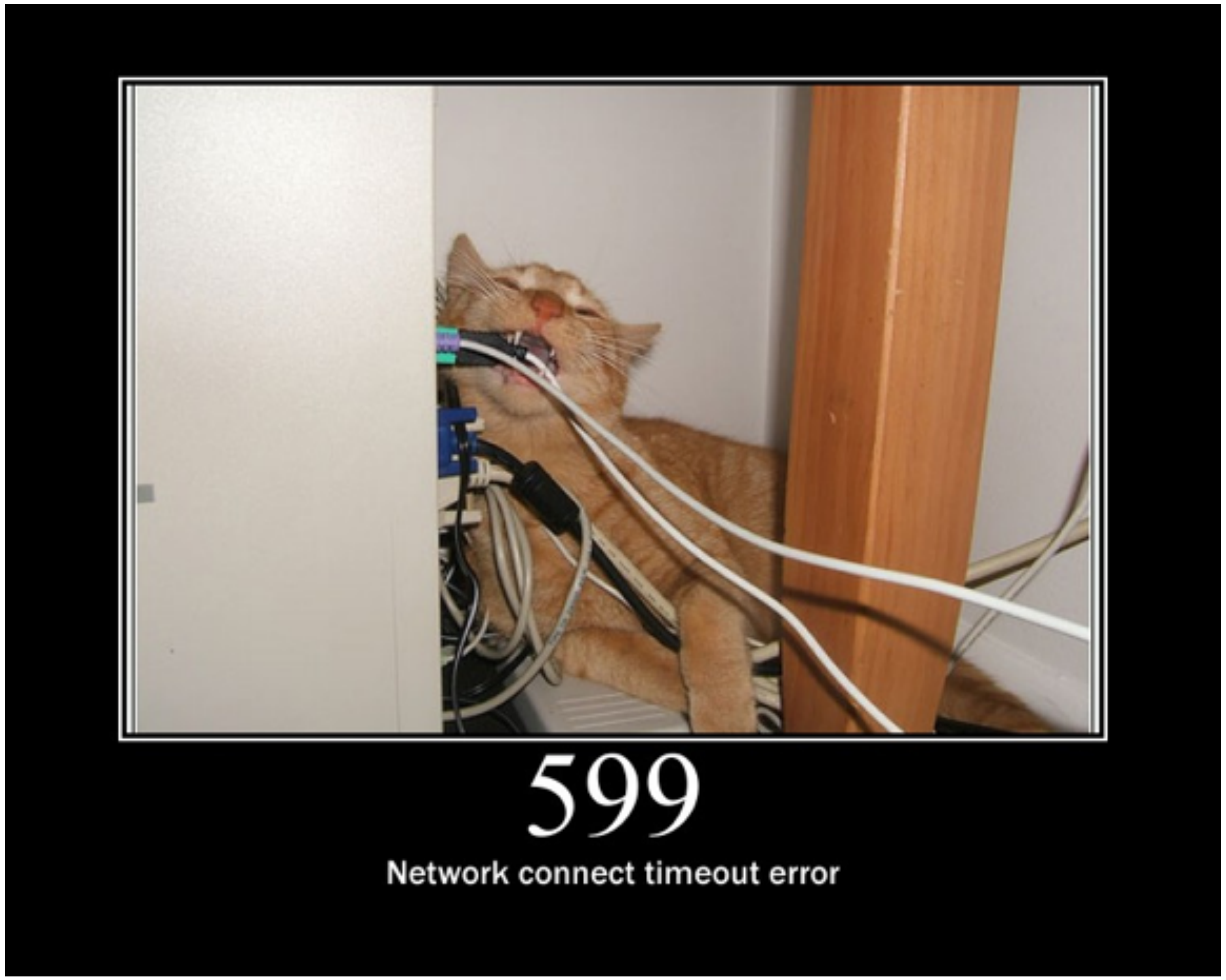
Status 3xx = Redirect

API Design

Status 4xx = Client Errors

API Design

Status 5xx = Service Errors



API Design

VERBS

API Design

HTTP Methods

POST/PUT	=	Create
GET	=	Read
PUT/PATCH	=	Update
DELETE	=	Delete

API Design

POST/PUT = Create

PUT if all values are known

api.domain.com/user

API Design

GET = READ

api.domain.com/user/**2**

API Design

PUT = IDEMPOTENT

Needs all info

Basically, include the ID

API Design

Put vs Post

Different Opinions

PUT   = create (idempotent)
POST = create (unknown resource)

PUT/PATCH = update (resource is known)

API Design

PUT = UPDATE

```
api.domain.com/user/2
{
  id: 2,
  first_name: ‘bob’,
  last_name: ‘cat’
}
```

API Design

PATCH = IDEMPOTENT

Needs all identifying info

Basically, include the ID

Does not need all info

Series of changes

API Design

PATCH = UPDATE

```
api.domain.com/user/2
[{
  id: 2,
  first_name: ‘bob’
}]
```

API Design

PATCH = UPDATE

```
api.domain.com/user/2
[
  {id: 2,first_name:'bob'}
  {id: 2,first_name:'bobby'}
]
```

API Design

DELETE = DELETE

api.domain.com/user/**2**

API Design

CONSISTENCY

API Design

URL endpoints represent data

/user	=	user
/company	=	company

API Design

A single Object maps to a singular URL

api.domain.com/user/**2**

api.domain.com/company/**3**

API Design

Objects map to plural URLs

api.domain.com/users

api.domain.com/companies

API Design

Common actions across most objects

```
GET /user/2
GET /company/3

DELETE /user/2
DELETE /company/3
```

Everybody chill the fuck out
I got this

API Design

https://site.com/api/statuses

Maps to all of the statuses

“Statuses” could be:

- SQL table
- NoSQL collection
- Aggregate Data

API Design

https://site.com/api/status/1234

Maps to a single status with the ID of 1234

API Design

Creating

If you know all of the data
(including the ID)

PUT https://site.com/api/status/1234

API Design

Creating

If you know all of the data
(including the ID)

PUT https://site.com/api/status/1234

Idempotent

No matter how many times you send this data only one resource should ever be created

API Design

Creating

If you know all of the data (including the ID)

PUT https://site.com/api/status/1234

```
{
id: 1234,
retweeted: false,
active: true
}
```

Implementation

Creating

If you don’t know all of the data

POST https://site.com/api/status

Implementation

Creating

If you don't know all of the data

POST https://site.com/api/status

Unique

Each time you post this data a new resource should be created

Implementation

Creating

If you don't know all of the data

POST https://site.com/api/status

```
{user_id: 1,
 text: 'Test Status'
}
```

Implementation

Creating

If you don’t know all of the data

POST https://site.com/api/status

```
{user_id: 1,
 text: ‘Test Status’
}
```

Response

```
{succes: true,
 id: 123
}
```

API Design

Reading

Get all statuses

GET https://site.com/api/statuses

API Design

Reading

Complex requests that require additional data

GET https://site.com/api/statuses

API Design

Reading

Get all of the statuses that have been retweeted and are active

GET https://site.com/api/statuses?retweeted=1&active=1

API Design

Updating

We know all of the identifying information so we PUT updates

Implementation

Updating

We know all the data

PUT https://site.com/api/status/123

```
{id: 123,
user_id: 1,
 text: 'Test Status 2'
}
```

Implementation

Updating

We know some of the data

PATCH https://site.com/api/status/123

```
{id: 123,
text: 'Test Status 3'
}
```

API Design

Delete

Just pass the identifying information

DELETE https://site.com/api/status/123

```
{id: 123}
```

API Design

Relationships

Get the user that posted a status

GET https://site.com/api/status/1234/user

Workshop

WALKTHROUGH 1

SETUP

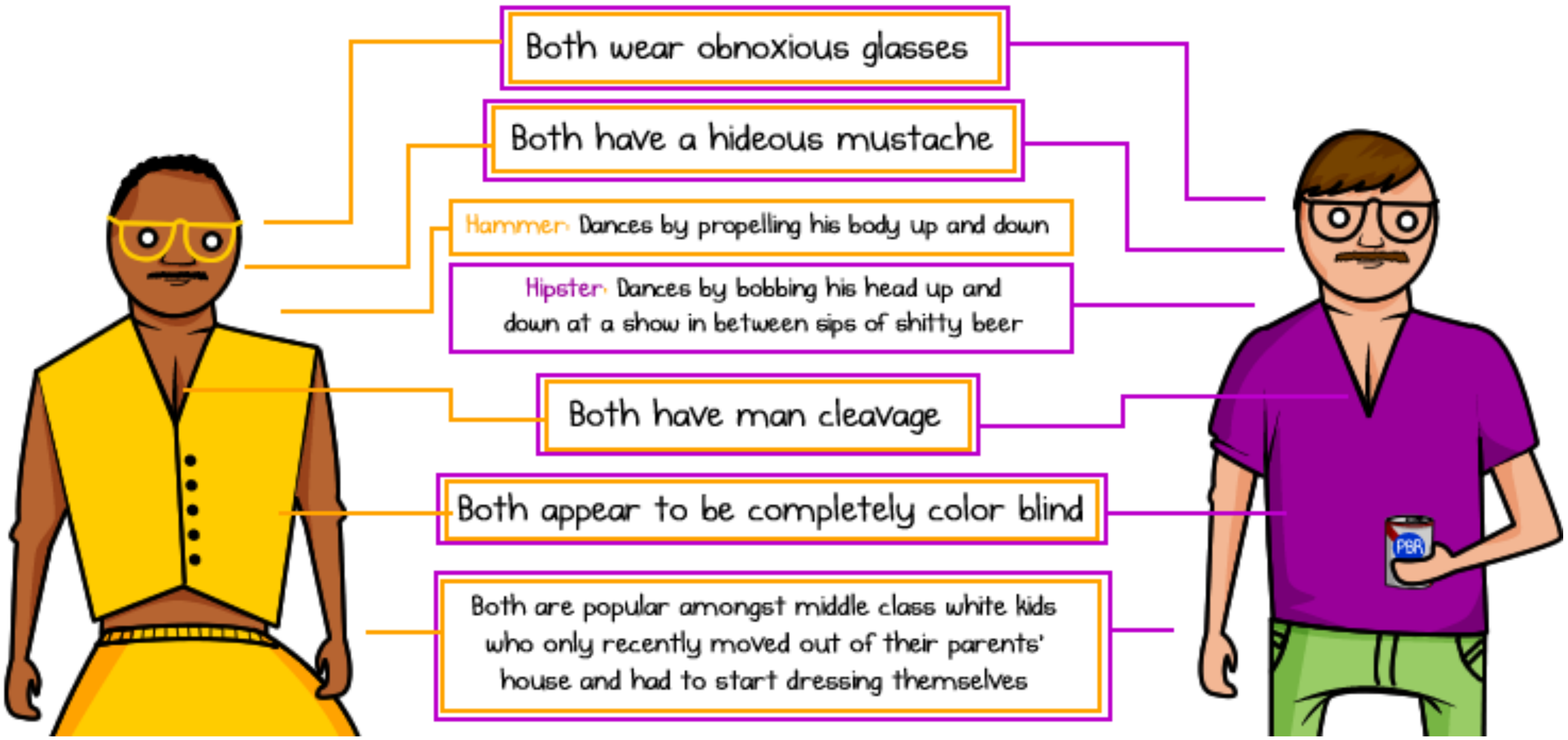
Workshop

WALKTHROUGH 2

TESTS

Hammer Pants VS Hipsters

A visual comparison


Both wear obnoxious glasses
Both have a hideous mustache
Hammer: Dances by propelling his body up and down
Hipster: Dances by bobbing his head up and down at a show in between sips of shitty beer
Both have man cleavage
Both appear to be completely color blind
Both are popular amongst middle class white kids who only recently moved out of their parents' house and had to start dressing themselves
PBR

Versioning

How to handle versioning?

Each version has a separate route -

GET https://site.com/api/v1/statuses

GET https://site.com/api/v2/statuses

Versioning

How to handle versioning?

Route newest API through
https://api.site.com

GET https://site.com/api/statuses
=
GET https://site.com/api/v2/statuses

Versioning

How to handle versioning?

Accept Headers
(HATEOAS)

Accept: application vnd.github.user.v4+json

Workshop

WALKTHROUGH 3

VERSIONING

HATEOAS

Hypermedia

as the

Engine

of

Application State

-OAS

HATEOAS

Content Negotiation

Hypermedia Controls

HATEOAS

Content Negotiation

Request "Accept" Header
(JSON, XML, YAML, etc)

Accept: application/x-yaml
Accept: application/json

HATEOAS

Content Negotiation

OPTIONS Http Request

Allow: GET, PUT, POST

HATEOAS

Hypermedia Controls

Links to Related Content

```
{  success: true,
   id: 123,
   links:
       {
          “rel”: ‘self’
          “url”: ‘/status/123’
       },
       {
          “rel”: ‘user’
          “url”: ‘/status/123/user’
       }
}
```

HATEOAS

Hypermedia Controls

Links to Related Content

```
{  success: false,
   error: {
     “code”:‘errorFail’
      “message”:‘You have Failed!’
       “url”:‘http://domain.com/docs/errorFail’
   }
}
```

Workshop

WALKTHROUGH 4

HATEOAS

PERMISSION
DENIED
quickmeme.com

Authentication

Who's the Consumer?

User Service

Internal Service

Authentication

Consumer = User

OAuth

Client **Server**

Request Token ->

<- Access Token

Authentication

Consumer = User

OAuth 2

Standard

Many Diff “Flows”

Complicated Spec

Authentication

Consumer = User

OAuth 2

Client **Server**

Request ->

w/AccessToken

Authentication

Consumer = Internal

Access Token = Service Key+Client Key

Client **Server**

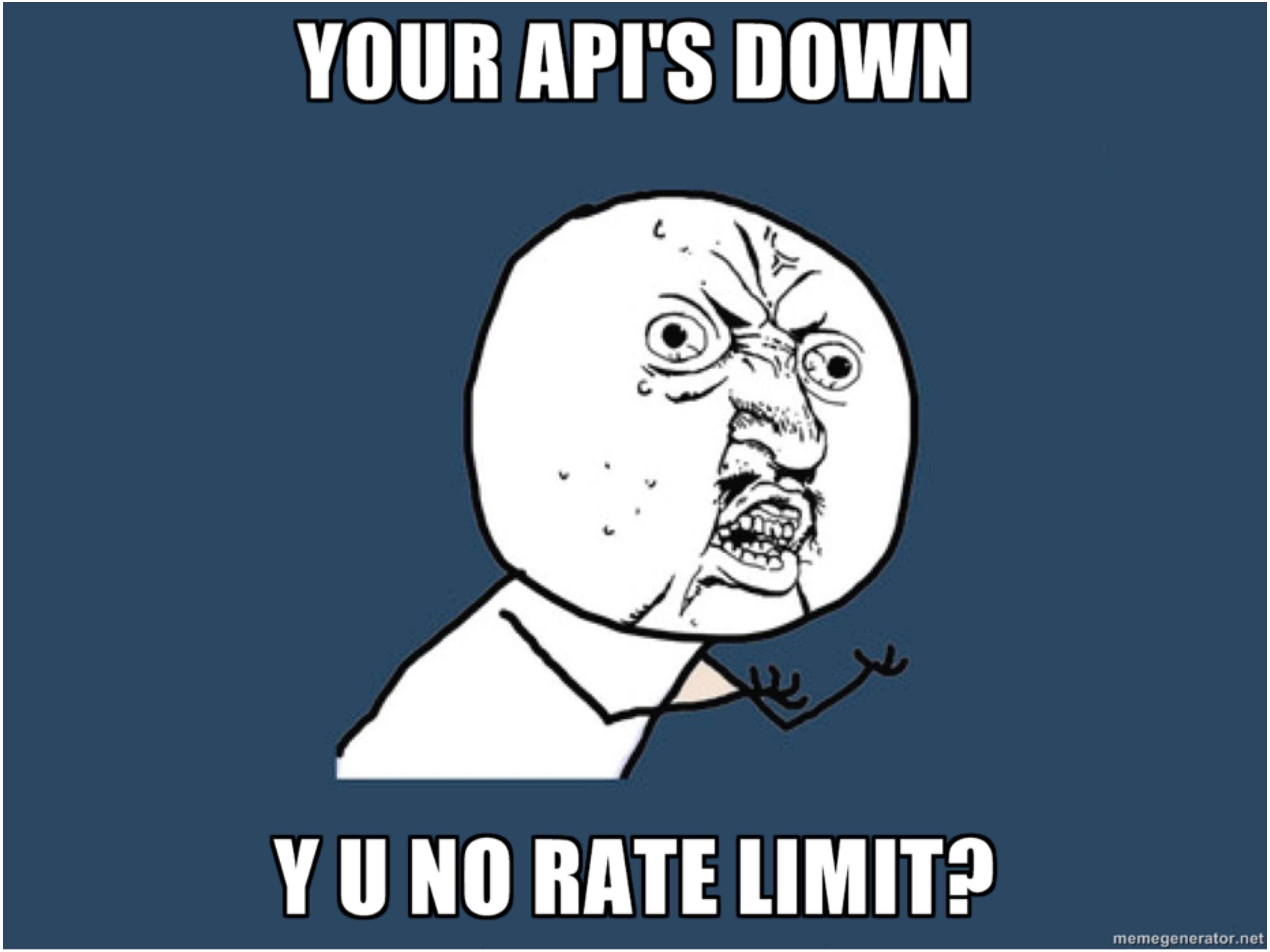
Request ->

w/Access Token

Authentication

Data Hash

SHA1 ($DATA)


YOUR API'S DOWN
Y U NO RATE LIMIT?
memegenerator.net

Rate Limiting

Prevent Abuse

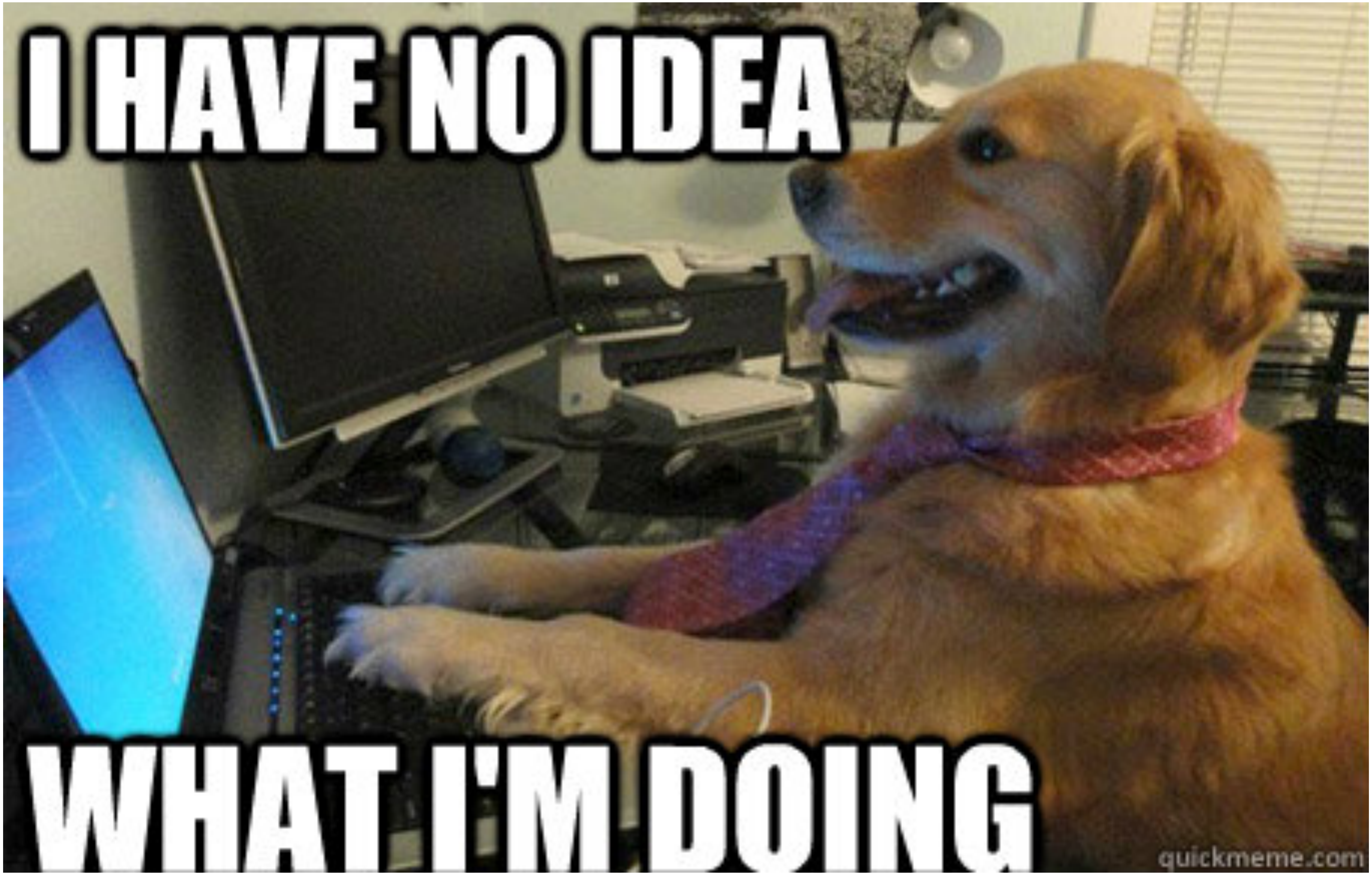
Maintain Availability

Client Key
IP Address
User ID

Workshop

WALKTHROUGH 5

AUTH & RATE LIMITING


I HAVE NO IDEA
WHAT I'M DOING
quickmeme.com

Debugging

How to debug as you develop?

CURL

Automated Tests

Rested on OSX

Workshop

WALKTHROUGH 6

BONUS - CLIENT

Go Make Cool Things

Resources

Book -
Build APIs You Won't Hate

https://leanpub.com/build-apis-you-wont-hate

Tutorial -
Demystifying REST

https://tutsplus.com/tutorial/demystifying-rest/

Resources

Blog - OAuth 2 Simplified

http://aaronparecki.com/articles/2012/07/29/1/oauth2-simplified

Book - OAuthello

https://leanpub.com/oauthello-a-book-about-oauth/

Resources

BuildSecurePHPapps.com

BUILDING SECURE PHP APPS

a practical guide

Ben Edmunds

Coupon Code:
phpoz
$3 off

http://buildsecurephpapps.com/?coupon=phpoz

Q/A TIME!

https://joind.in/

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http://buildsecurephpapps.com/?coupon=phpoz