You’re probably making an API client

Haroen Viaene - BucharestJS

Hi there!

Hi there!

Haroen

Hi there!

Haroen

(however you want)

Hi there!

Haroen

(however you want)

Hi there!

Haroen

(however you want)

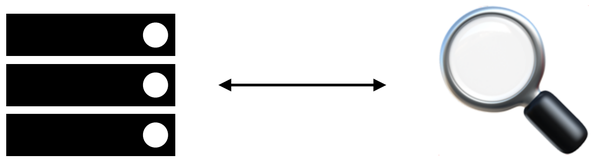
🔍

Hi there!

Haroen

algolia

(however you want)

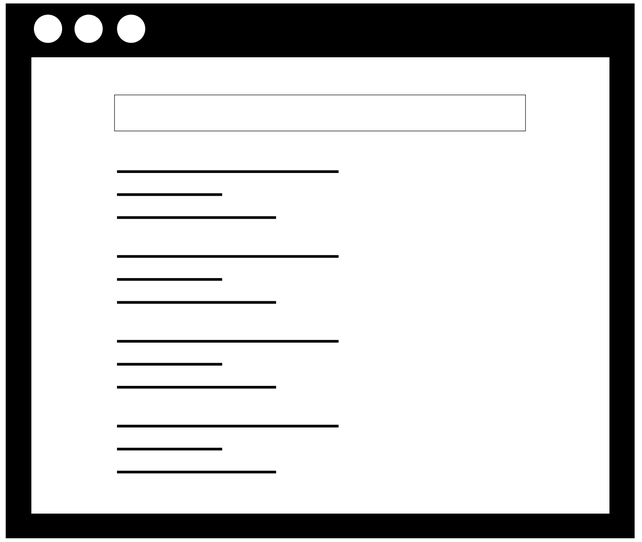


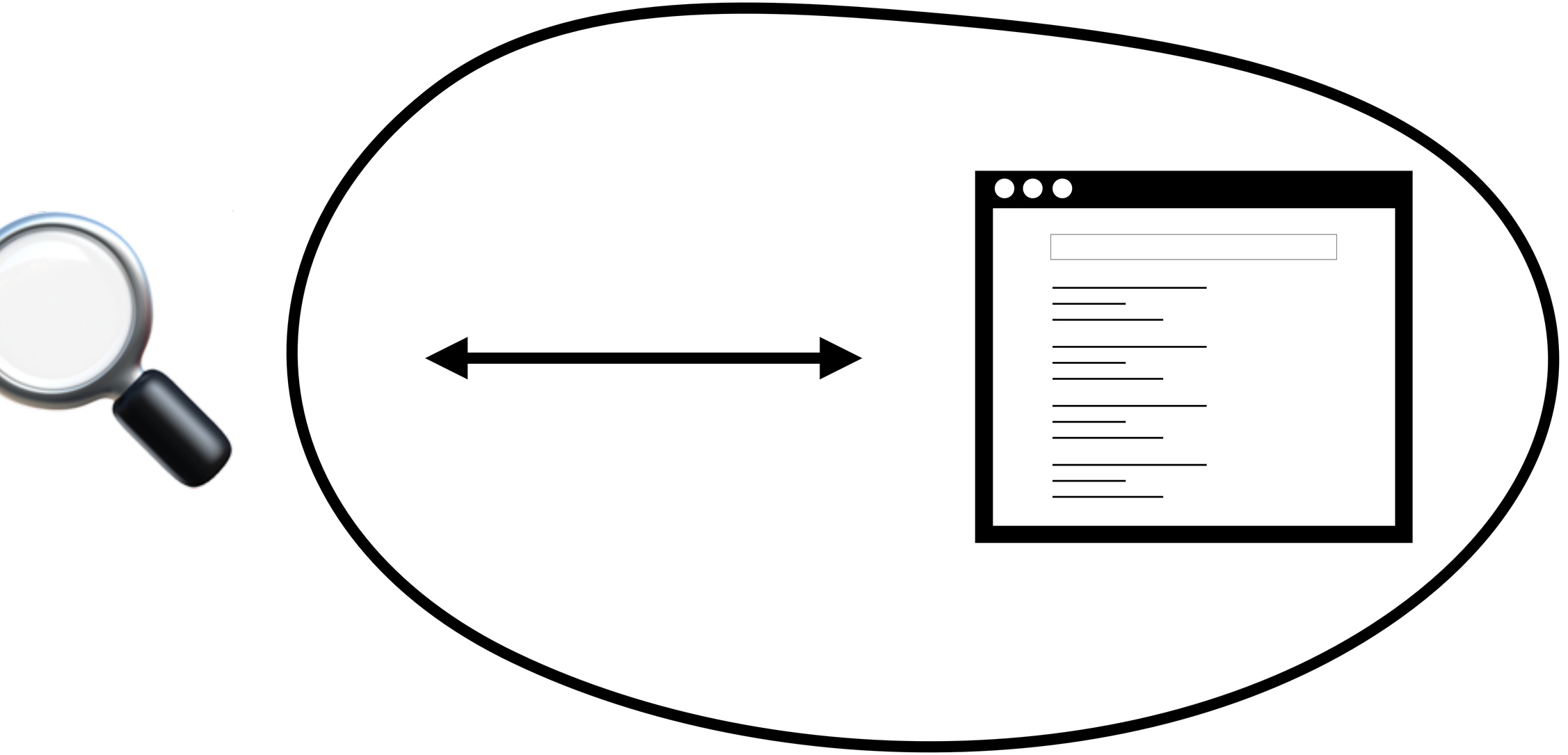
Hi there!

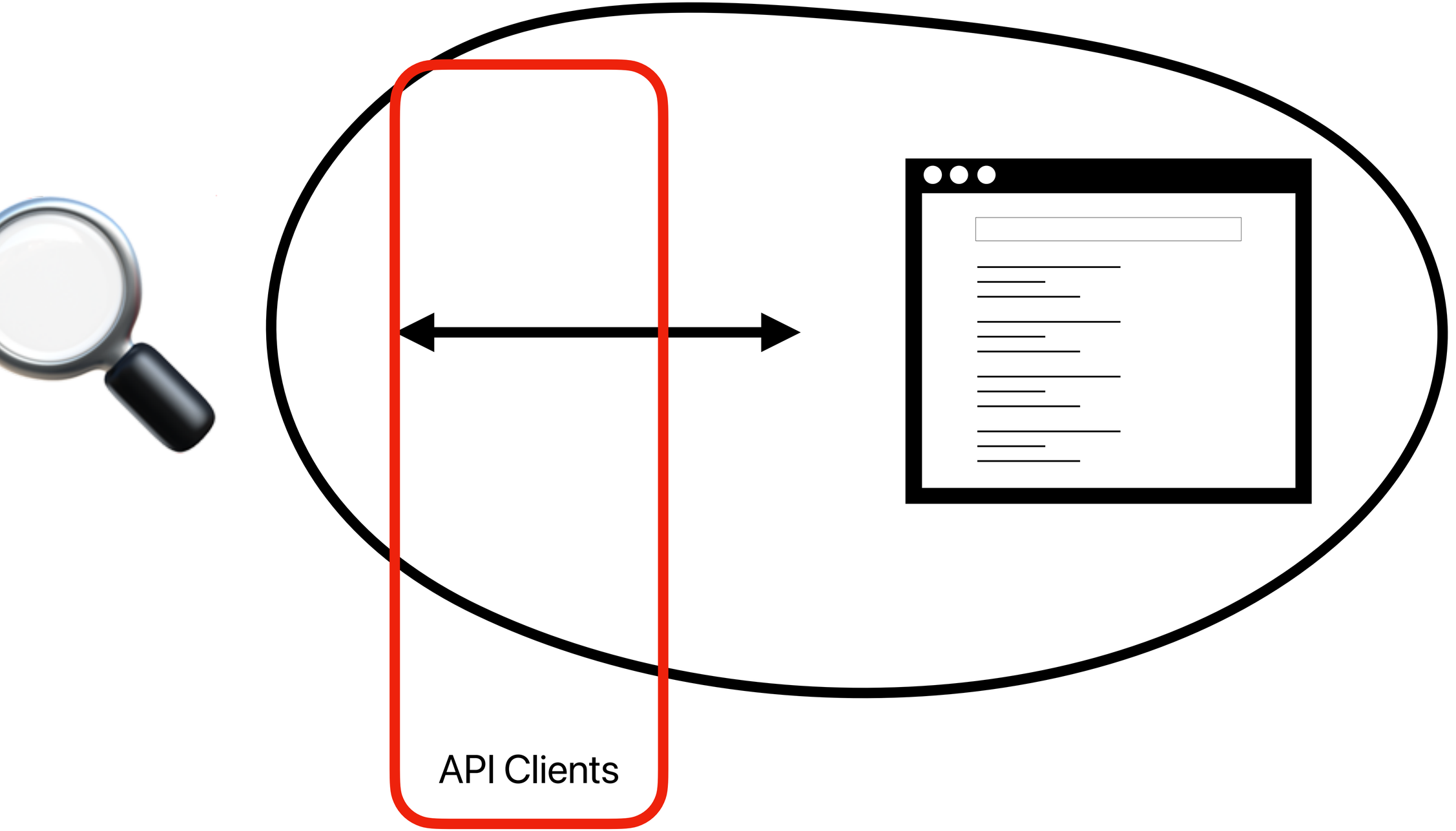
Haroen

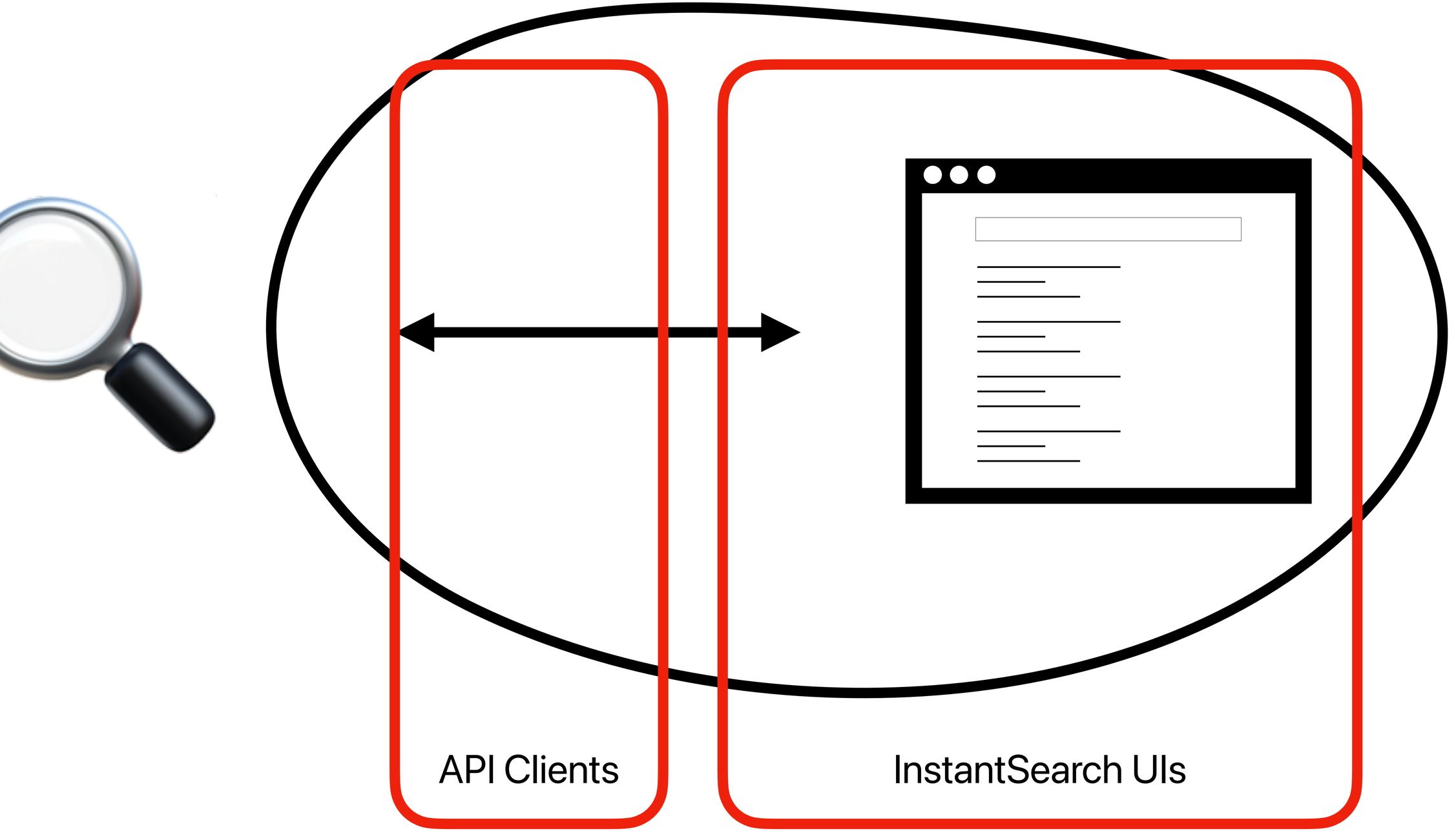
algolia

(however you want)






API Clients


API Clients
InstantSearch UIs

What will be covered

What will be covered

Terminology

What will be covered

Terminology

Why API clients

What will be covered

Terminology

Why API clients

Anatomy of an API client

What will be covered

Terminology

Why API clients

Anatomy of an API client

How to make a good API client

What is

What is an API?

What is an API?

What is an API client?

What is an API?

What is an API client?

What is an abstraction?

Something which gives
you access to a capability

Something which gives
you access to a capability

Something which **gives**
you **access** to a capability

Something which gives
you access to a **capability**

What is an abstraction?

Why use an API client?

Abstraction

Avoid repetition

Easier testing

Edge cases are handled

4

Allows API to be more complex

When should you use an API client?

“Use the official API client”

– Me, just now

“When you do multiple requests to an endpoint”

– Me, just now

MVP

MVP

```
fetch("https://api.com", {
  method: "POST",
  body,
}).then(res => res.json());
```

Minimum Viable Product

```
fetch("https://api.com", {
  method: "POST",
  headers: {
    "Content-Type": "application/json",
    "X-API-Key": "OFOCS02NSE4",
  },
  body: JSON.stringify({
    query: "hello",
  }),
}).then(res => res.json());
```

Put them in a file maybe?

```
export const query = body =>
  fetch("https://api.com", {
    method: "POST",
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": "OFOCS02NSE4",
    },
    body: JSON.stringify(body),
  }).then(res => res.json());

// …other ones
```

CERTIFICATE *of* ACHIEVEMENT

THIS ACKNOWLEDGES THAT

BucharestJS attendees

HAS SUCCESSFULLY COMPLETED THE

API Client Course

2021

SIGNED, *Haroen Viaene*

algolia

What I've learned

What I've learned

Design

What I've learned

Design **Performance**

What I've learned

Design **Performance** **Maintainability**

Design

Provide value

Provide value

```
fetch("https://api.com", {
  method: "POST",
  headers: {
    "Content-Type": "application/json",
    "X-API-Key": "OFOCS02NSE4",
  },
  body: JSON.stringify(body),
}).then(res => res.json());
```

Provide value

```
const query = body =>
  fetch("https://api.com", {
    method: "POST",
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": "OFOCS02NSE4",
    },
    body: JSON.stringify(body),
  }).then(res => res.json());
```

Provide value

```
query(query)
```

Design

Handle credentials

Handle credentials

```
const get = (body, apiKey) =>
  fetch("https://api.com", {
    method: "POST",
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": apiKey,
    },
    body: JSON.stringify(body),
  }).then(res => res.json());
```

Handle credentials

```
const get = (body, apiKey) =>
  fetch("https://api.com", {
    method: "POST",
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": apiKey,
    },
    body: JSON.stringify(body),
  }).then(res => res.json());
```

Handle credentials

⚠️ **PSEUDO CODE**

PSEUDO CODE

Handle credentials

```
const createClient = apiKey =>
  allMethods.map(method => /* */);
```

PSEUDO CODE

Handle credentials

```
const createClient = apiKey =>
  allMethods.map(method => (...args) =>
    method(...args, apiKey)
  );
```

PSEUDO CODE

Handle credentials

```
const createClient = apiKey =>
  allMethods.map(method => (...args) =>
    method(...args, apiKey)
  );

const client = createClient("OFOCS02NSE4");
```

PSEUDO CODE

Handle credentials

```
const createClient = apiKey =>
  allMethods.map(method => (...args) =>
    method(...args, apiKey)
  );

const client = createClient("OFOCS02NSE4");

client.query(body);
```

Use “named” arguments

Use “named” arguments

```
const createClient = ({ apiKey }) =>
  allMethods.map(method => args =>
    method(args, { apiKey })
  );

const client = createClient({
  apiKey: "OFOCS02NSE4"
});

client.query({ body });
```

Use “named” arguments

```
const createClient = ({ apiKey }) =>
  allMethods.map(method => args =>
    method(args, { apiKey })
  );

const client = createClient({
  apiKey: "OFOCS02NSE4"
});

client.query({ body });
```

Design

Use the same names as your API

Use the same names as your API

```
const query = ({body}, {apiKey}) =>
  fetch("https://api.com/search", {
    method: "POST",
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": apiKey
    },
    body: JSON.stringify(body)
  }).then(res => res.json());
```

Use the same names as your API

```
const search = ({body}, {apiKey}) =>
  fetch("https://api.com/search", {
    method: "POST",
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": apiKey
    },
    body: JSON.stringify(body)
  }).then(res => res.json());
```

Use the same names as your API

```
const search = ({parameters}, {apiKey}) =>
  fetch("https://api.com/search", {
    method: "POST",
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": apiKey
    },
    body: JSON.stringify(parameters)
  }).then(res => res.json());
```

Design

Fill the gaps in the API

Fill the gaps in the API

Fill the gaps in the API

```
/batch
```

Fill the gaps in the API

`/batch`

Catch-all

Fill the gaps in the API

`/batch`

Catch-all

Split up in separate methods (`addObjects`, `deleteObjects`)

Fill the gaps in the API

`/batch`

Catch-all

Split up in separate methods (`addObjects`, `deleteObjects`)

Consistency in client > consistency in API

Design

Allow overriding

Allow overriding

Sunil Pai
@threepointone

The quality of an abstraction is directly related to the quality of its escape hatches

Allow overriding

```
const createClient = ({ apiKey }) =>
  allMethods.map(method => (args, extra) =>
    method(args, { apiKey, ...extra })
  );

const client = createClient({
  apiKey: "OFOCS02NSE4"
});

client.search(
  { body },
  { apiKey: "something-else" }
);
```

Allow overriding

```
const createClient = ({ apiKey }) =>
  allMethods.map(method => (args, extra) =>
    method(args, { apiKey, ...extra })
  );

const client = createClient({
  apiKey: "OFOCS02NSE4"
});

client.search(
  { body },
  { apiKey: "something-else", requestOptions }
);
```

Allow overriding

RequestOptions

Known headers are sent as headers

The rest as URL parameters

Design

Separate request from wrappers

Separate request from wrappers

Separate request from wrappers

```
const method = (...) =>
  fetch(...)
  // ...
```

Separate request from wrappers

```
const method = (...) =>
  fetch(...)
  // ...
```

```
const method = (...) =>
  request(...)

const request = (...) =>
  fetch(...)
```

Separate request from wrappers

Separate request from wrappers

Separate request from wrappers

Separate request from wrappers

Separate request from wrappers

```
fetch(new URL("https://api.com", path), {
    method,
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": apiKey
    },
    body: JSON.stringify(body)
  }).then(res => res.json());
```

Separate request from wrappers

```
const request = ({
  path,
  method,
  body,
  apiKey
}) => fetch(new URL("https://api.com", path), {
    method,
    headers: {
      "Content-Type": "application/json",
      "X-API-Key": apiKey
    },
    body: JSON.stringify(body)
  }).then(res => res.json());
```

Separate request from wrappers

```
const search = ({ query }, { apiKey }) =>
  request({
    path: "/search",
    method: "POST",
    body: { query },
    apiKey
  });
```

Design

Everything is async

Everything is async

Everything is async

```
await client.search()
```

Everything is async

```
await client.search()
```

```
client.generateApiKey()
```

Everything is async

```
await client.search()
```

```
await client.generateApiKey()
```

What I've learned

Design **Performance** **Maintainability**

Know one layer of abstraction lower

Know one layer of abstraction lower

Know one layer of abstraction lower

All abstractions are leaky

Know one layer of abstraction lower

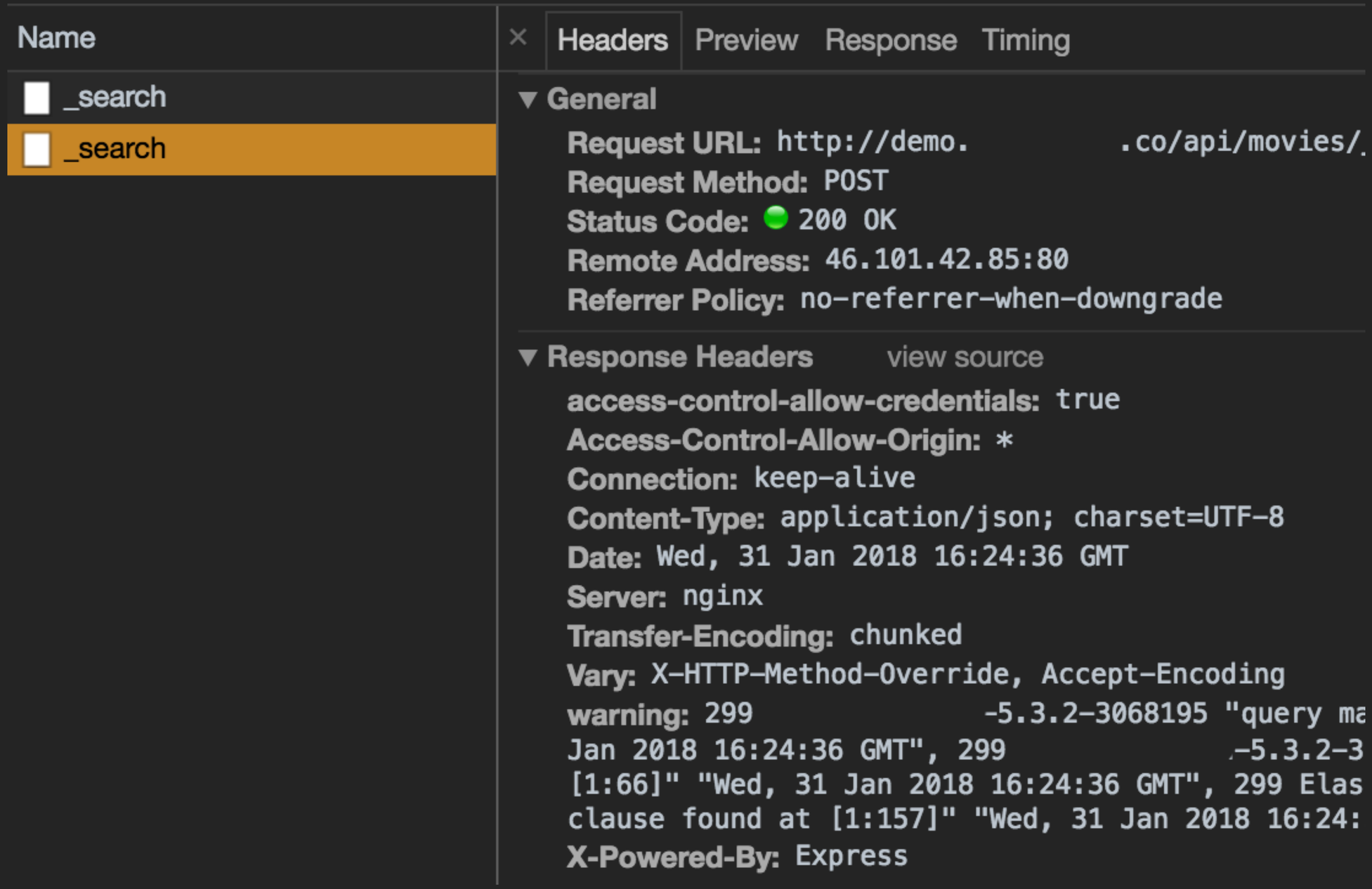
All abstractions are leaky

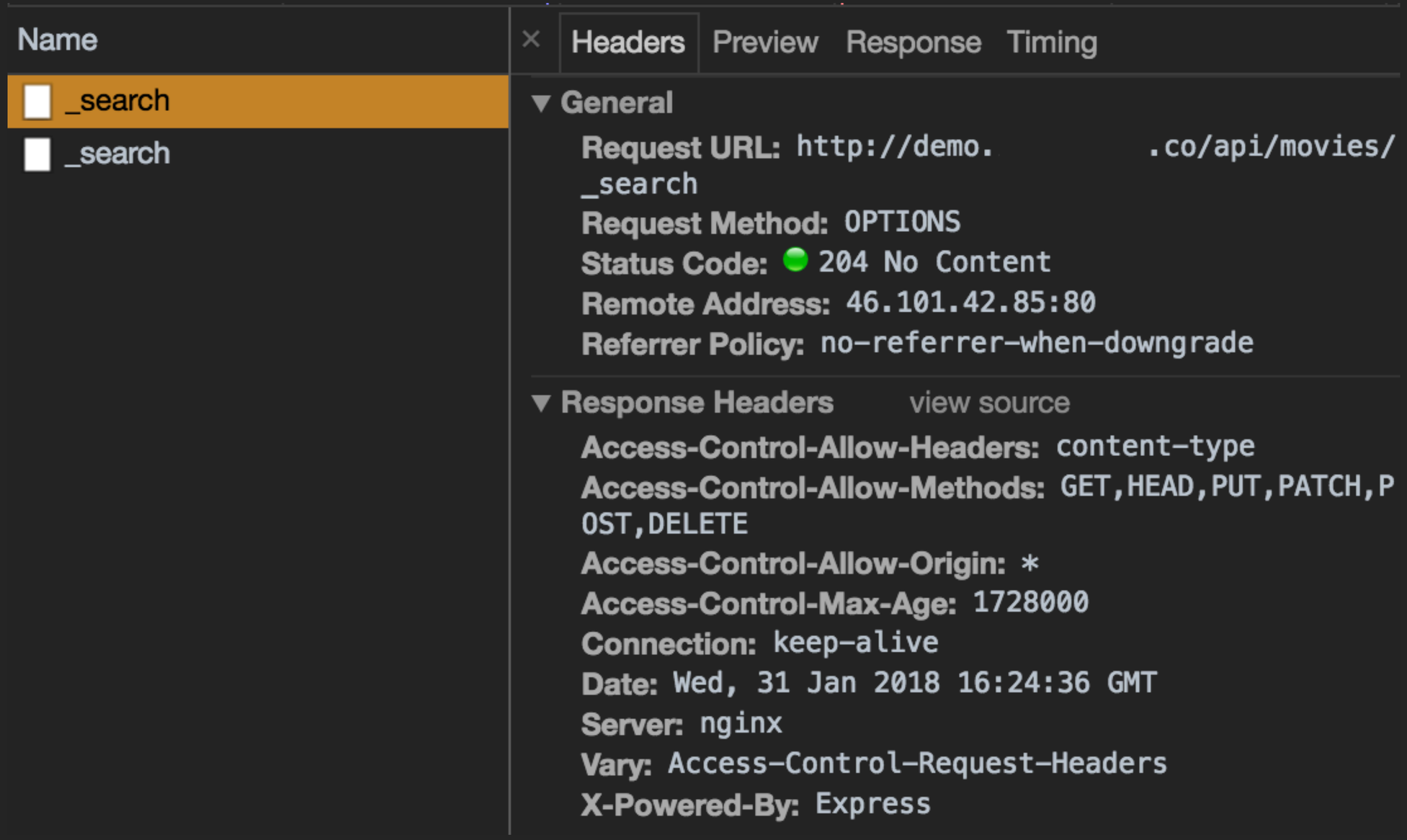
CORS

Know one layer of abstraction lower

All abstractions are leaky

Cross Origin Resource Sharing


Name
_search
_search
Headers
Preview
Response
Timing
General
Request URL: http://demo. .co/api/movies/
Request Method: POST
Status Code: 200 OK
Remote Address: 46.101.42.85:80
Referrer Policy: no-referrer-when-downgrade
Response Headers
view source
access-control-allow-credentials: true
Access-Control-Allow-Origin: *
Connection: keep-alive
Content-Type: application/json; charset=UTF-8
Date: Wed, 31 Jan 2018 16:24:36 GMT
Server: nginx
Transfer-Encoding: chunked
Vary: X-HTTP-Method-Override, Accept-Encoding
warning: 299 -5.3.2-3068195 "query ma
Jan 2018 16:24:36 GMT", 299 .-5.3.2-3
[1:66]" "Wed, 31 Jan 2018 16:24:36 GMT", 299 Elas
clause found at [1:157]" "Wed, 31 Jan 2018 16:24:
X-Powered-By: Express


Name
_search
_search
Headers
Preview
Response
Timing
General
Request URL: http://demo. .co/api/movies/_search
Request Method: OPTIONS
Status Code: 204 No Content
Remote Address: 46.101.42.85:80
Referrer Policy: no-referrer-when-downgrade
Response Headers
view source
Access-Control-Allow-Headers: content-type
Access-Control-Allow-Methods: GET,HEAD,PUT,PATCH,POST,DELETE
Access-Control-Allow-Origin: *
Access-Control-Max-Age: 1728000
Connection: keep-alive
Date: Wed, 31 Jan 2018 16:24:36 GMT
Server: nginx
Vary: Access-Control-Request-Headers
X-Powered-By: Express

SimpleRequests

SimpleRequests

https://developer.mozilla.org/en-US/docs/Web/HTTP/CORS

Specific headers

Specific methods

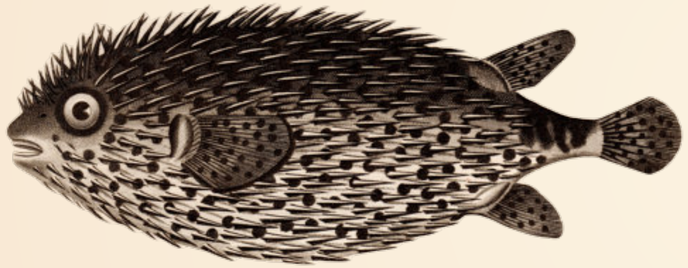
Specific content type

What I've learned

Design **Performance** **Maintainability**

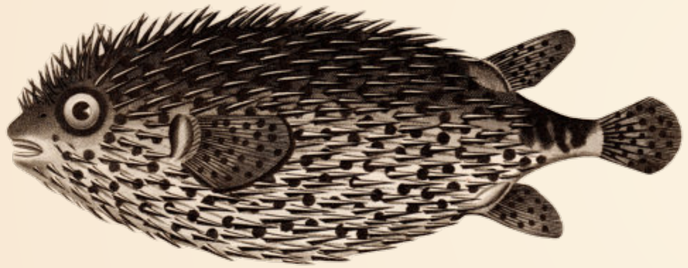
Change over time

Your API over time

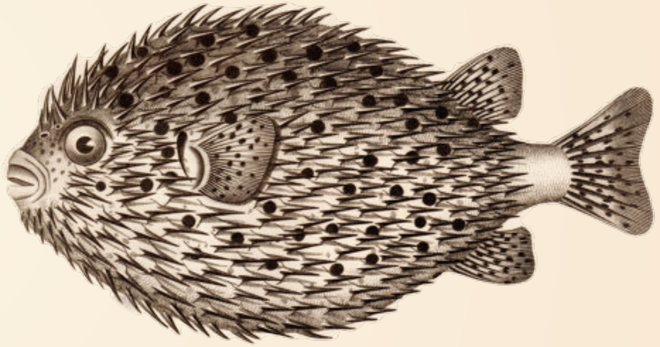


New

Your API over time



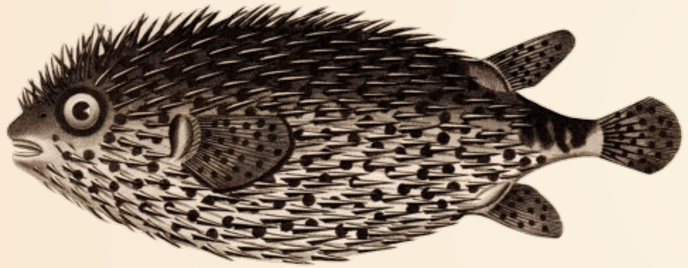
New

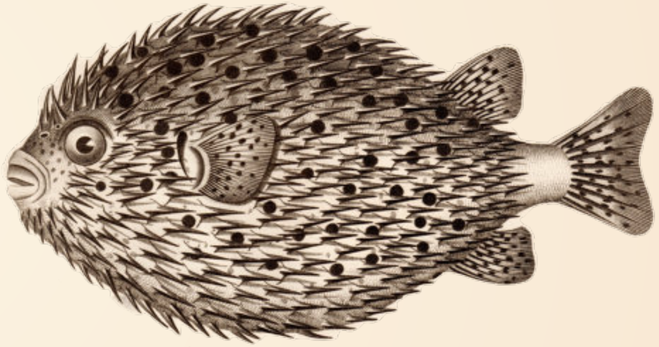


Now

Encyclopaedia Londinensis or The Universal Dictionary of Arts, Sciences & Literature

Your API over time





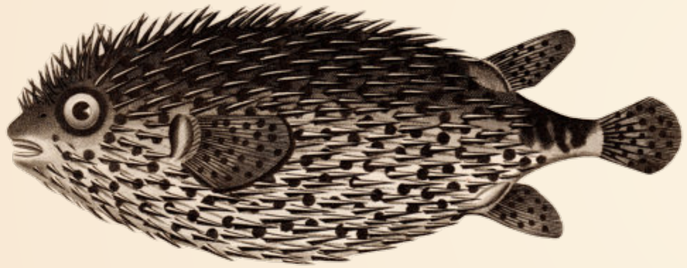
New

Now

Useless

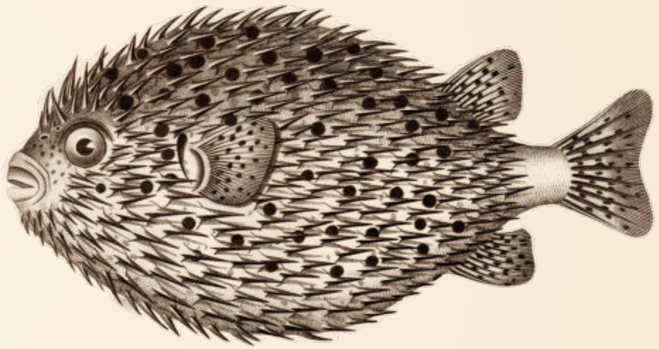
Encyclopaedia Londinensis or The Universal Dictionary of Arts, Sciences & Literature

Your API over time



New

Broken

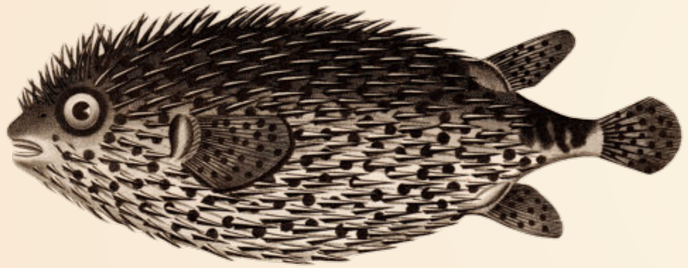


Now

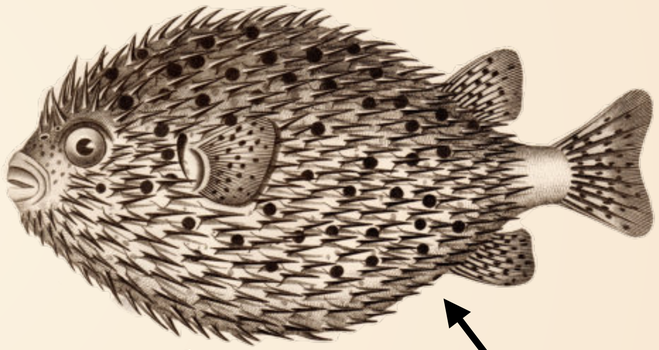
Useless

Encyclopaedia Londinensis or The Universal Dictionary of Arts, Sciences & Literature

Your API over time



New



Now

Useless

Old workaround

Encyclopaedia Londinensis or The Universal Dictionary of Arts, Sciences & Literature

Removing code!

Removing code!

1 Let your users know

Removing code!

1. Let your users know
2. Measure usage

Removing code!

1. Let your users know
2. Measure usage
3. Delete

1 Let your users know

```
console.warn(
`The feature XXX is now deprecated.

Instead you can use YYY

https://github.com/XXX/wiki/deprecated#XXX`
);
```

1 Let your users know

```
console.warn(
`The feature XXX is now deprecated.

Instead you can use YYY

https://alg.li/js-deprecated#XXX`
);
```

1 Let your users know

```
const deprecated = ({
  deprecated,
  replacement,
  callback,
  args
}) => {
  const anchor = deprecated.toLowerCase().replace(/[\.\(\)]/g, '');
  console.warn(
    `The feature ${deprecated} is now deprecated.

    Instead you can use ${replacement}

    https://alg.li/js-deprecated#${anchor}`
  );
  return callback(args);
};
```

Removing code!

1. Let your users know
2. Measure usage
3. Delete

2 Measure usage

2 Measure usage

Existing analytics

2 Measure usage

Existing analytics

User agents

2 Measure usage

Existing analytics

User agents

`/usage/somefeature/?userid=XFCSDS`

2 Measure usage

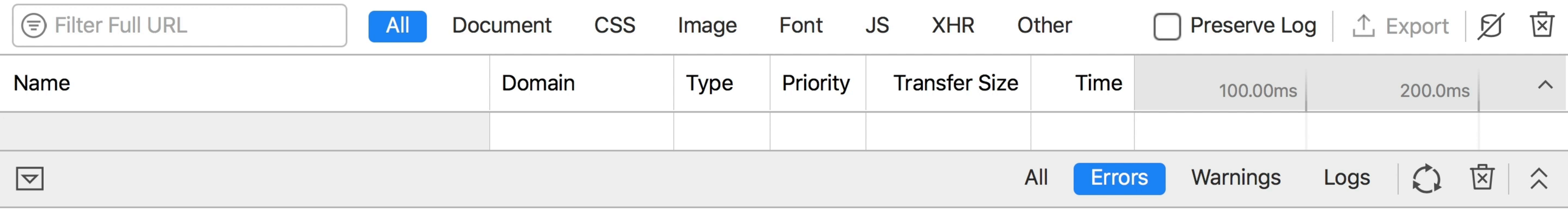
Existing analytics

User agents

```
/usage/somefeature/?userid=XFCSDS
```

```
new Image().src = '…'
```

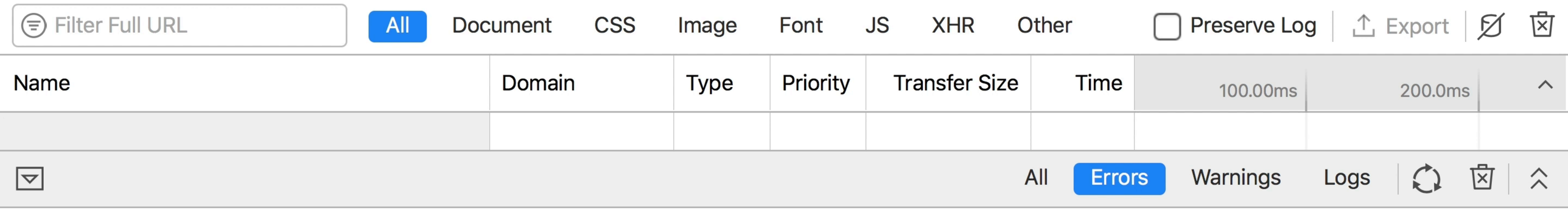
2 Measure usage



Console cleared at 9:36:37 AM

```
> new Image().src = "https://httpbin.org/anything/somefeature/?userid=QSDF"
```

2 Measure usage



Console cleared at 9:36:37 AM

```
> new Image().src = "https://httpbin.org/anything/somefeature/?userid=QSDF"
```

2 Measure usage

```
app.get('/usage/:feature', function(req, res)
{

  increment({
    feature: req.params.feature,
    userid: req.query.userid,
  });

  res.send('acknowledged');
});
```

2 Measure usage

```
app.get('/usage/:feature', function(req, res)
{

  increment({
    feature: req.params.feature,
    userid: req.query.userid,
  });

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2 Measure usage

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app.get('/usage/:feature', function(req, res)
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  });

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2 Measure usage

```
app.get('/usage/:feature', function(req, res)
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  increment({
    feature: req.params.feature,
    userid: req.query.userid,
  });

  res.send('acknowledged');
});
```

Removing code!

1. Let your users know
2. Measure usage
3. Delete

3 Delete

3 Delete

Write deletable code

3 Delete

Write deletable code

Modularity

3 Delete

Write deletable code

Modularity

Add maintainer notes

Removing code!

1. Let your users know
2. Measure usage
3. Delete

Maintainability

Testing

Testing

Testing

1 Arguments

Testing

1 Arguments

2 Network

Testing

1. Arguments
2. Network
3. Functional

1 Arguments

1 Arguments

Are the methods sending the correct requests?

1 Arguments

Are the methods sending the correct requests?

Mock `request`

1 Arguments

Are the methods sending the correct requests?

Mock `request`

Snapshot testing

Testing

1. Arguments
2. Network
3. Functional

2 Network

2 Network

Mock underlaying network layer

2 Network

Mock underlaying network layer

Test `request` as a pure function

Testing

1. Arguments
2. Network
3. Functional

3 Functional

3 Functional

Write as a user

3 Functional

Write as a user

Use the real API

3 Functional

Write as a user

Use the real API

Clean up afterwards

Versioning

Versioning

Removing things

Changing things

Rewriting things

Versioning

Removing things

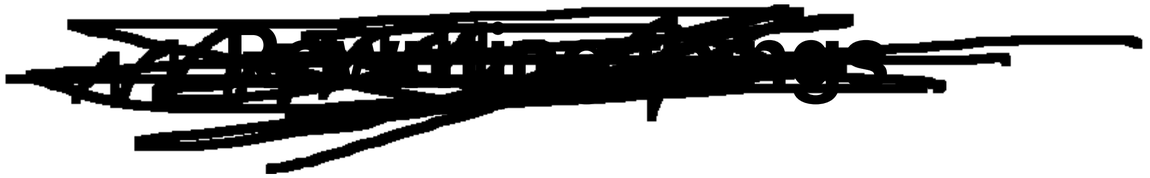
Changing things

~~Rewriting things~~

Versioning

Removing things

Changing things



Why not?

Problems you know ➡️ problems you don’t know

Not shipping

Why?

Lack of knowledge

You can cheat

You can cheat

GitHub

Overview

Overview

Separation of concerns

Overview

Separation of concerns

Pick the right abstraction

Overview

Separation of concerns

Pick the right abstraction

Have a “client” for credentials

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Have a “client” for credentials

Know one level lower (SimpleRequests)

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Know when to deviate from your server API

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Know when to deviate from your server API

Deprecate with confidence

Overview

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Deprecate with confidence

Look at other API clients

Thanks!

haroen.me/presentations