Intro to APIs

CUHACKIT 2022

Jacky Wong

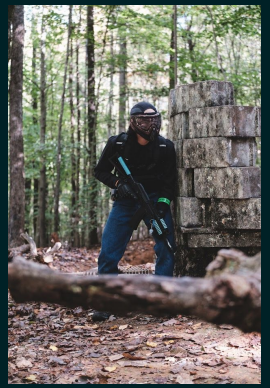
WHO AM I?

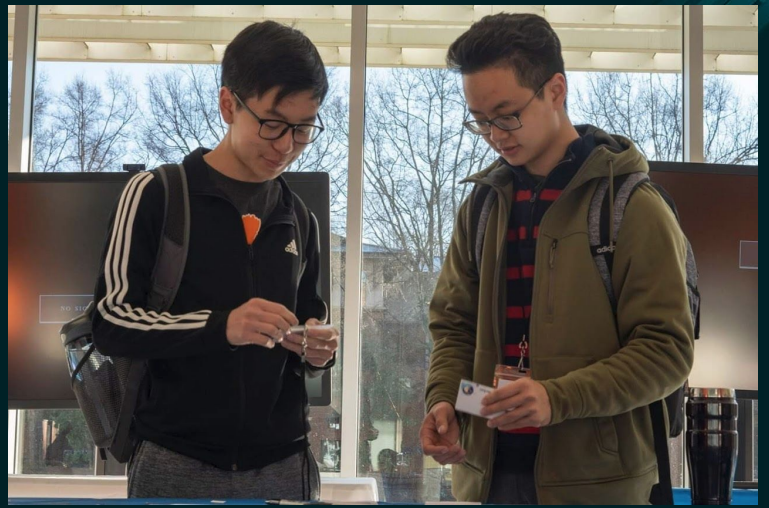
Master’s student in Computer Science at Clemson

Wanted to ‘do computer stuff’ ever since elementary school

Hopeful frontend developer, working at CCIT, previously intern and co-op

Airsoft, anime, cars, cooking, D&D, music





01

WHAT IS AN API

Definition,
How they work,
How to use.

02

REST APIs

The basics of the most common API.

03

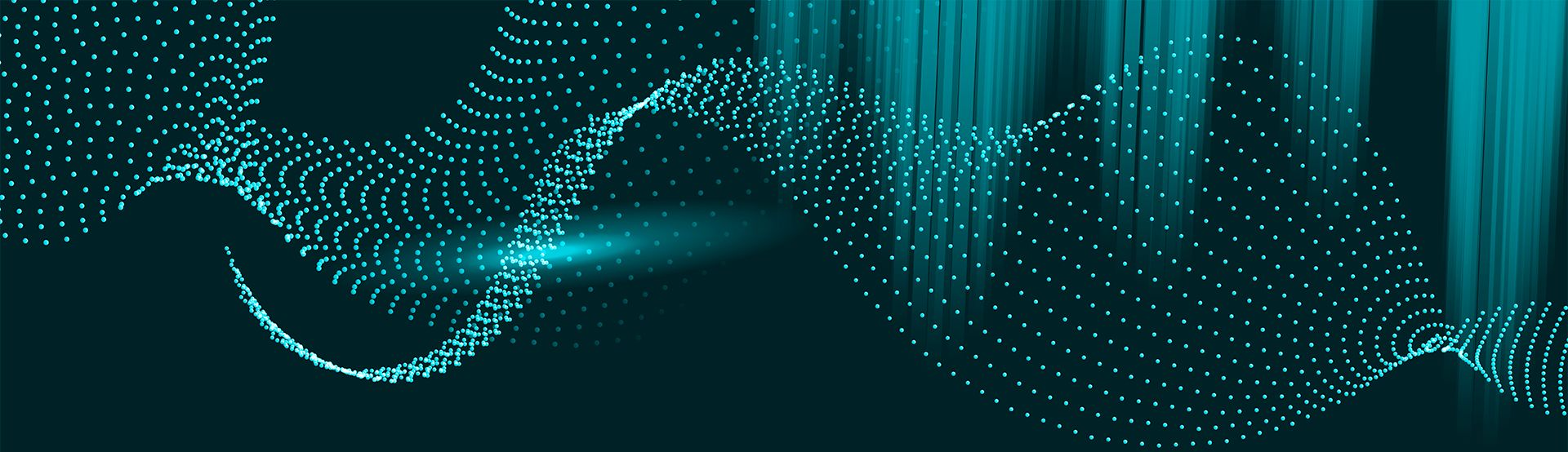
EXAMPLES

What using an API looks like in code.

04

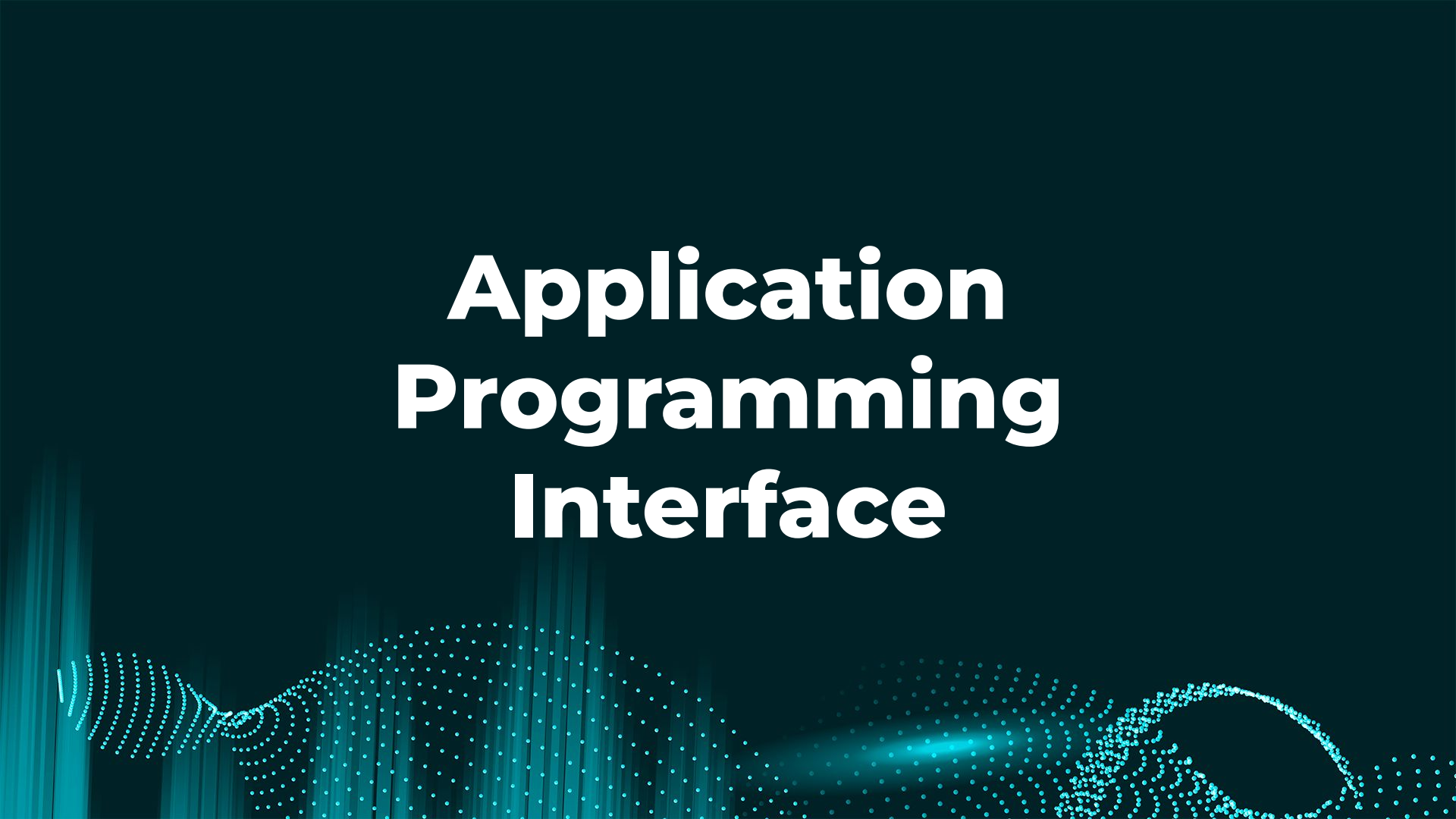
LIVE DEMO

What could possibly go wrong?

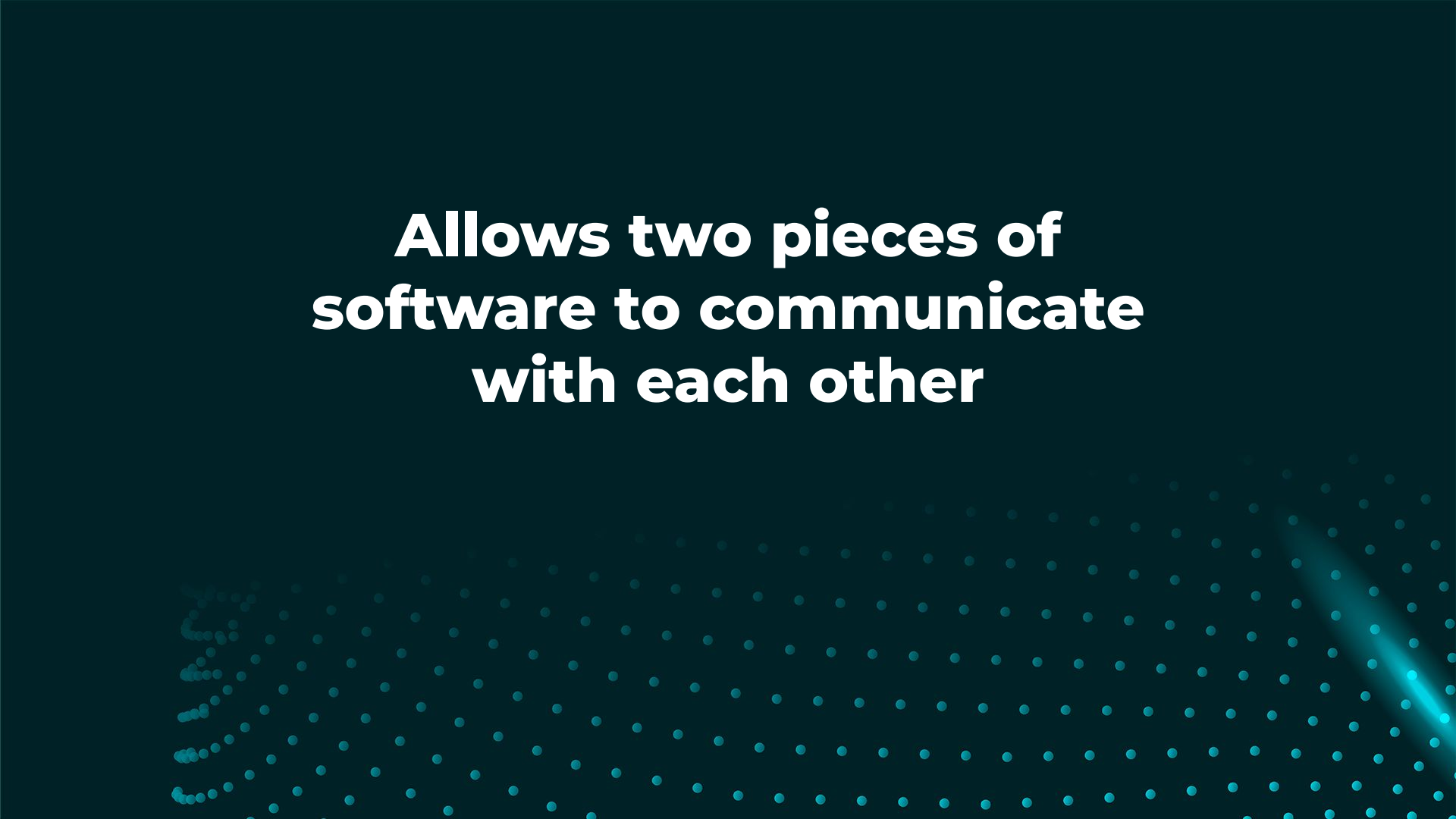


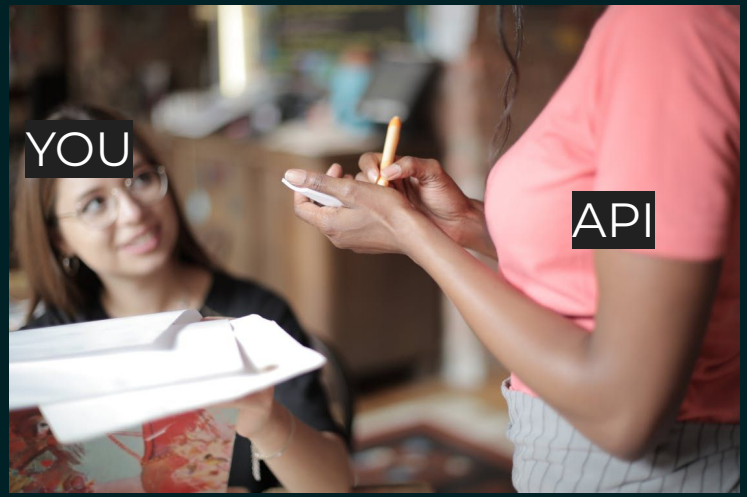
01 What is an API?

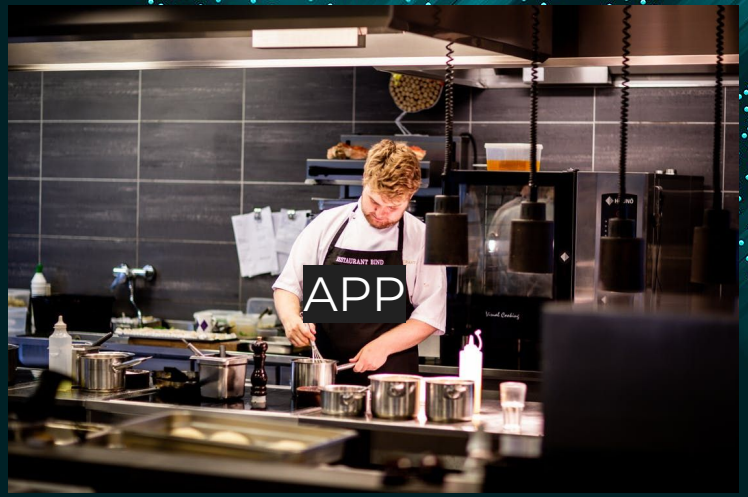
Application Programming Interface



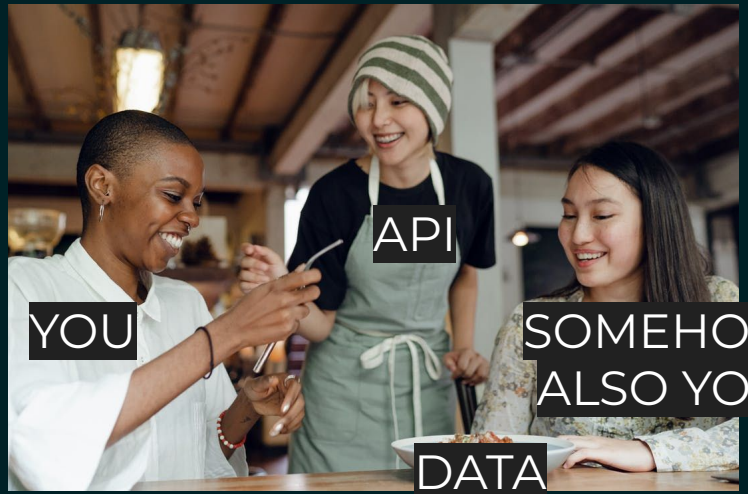
Allows two pieces of software to communicate with each other



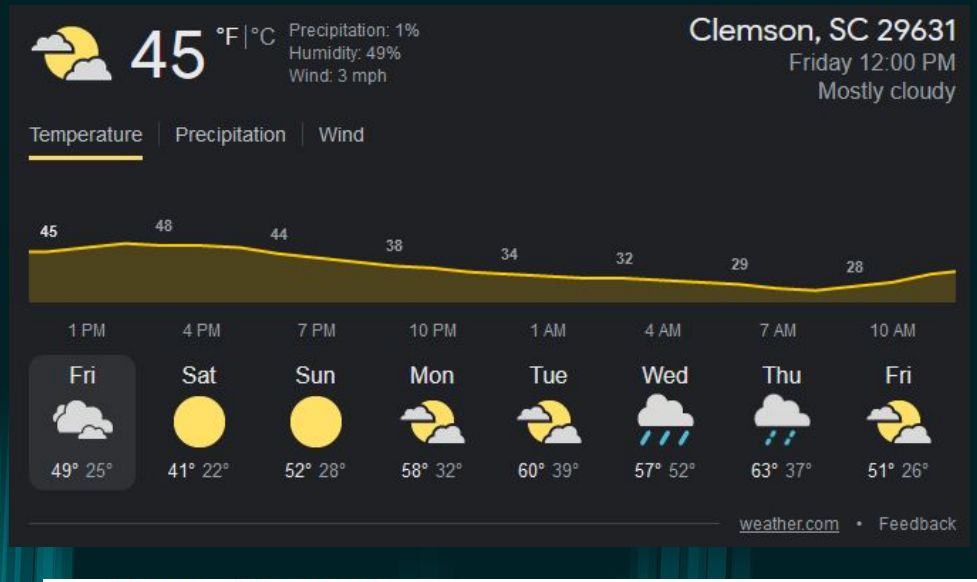

YOU
API

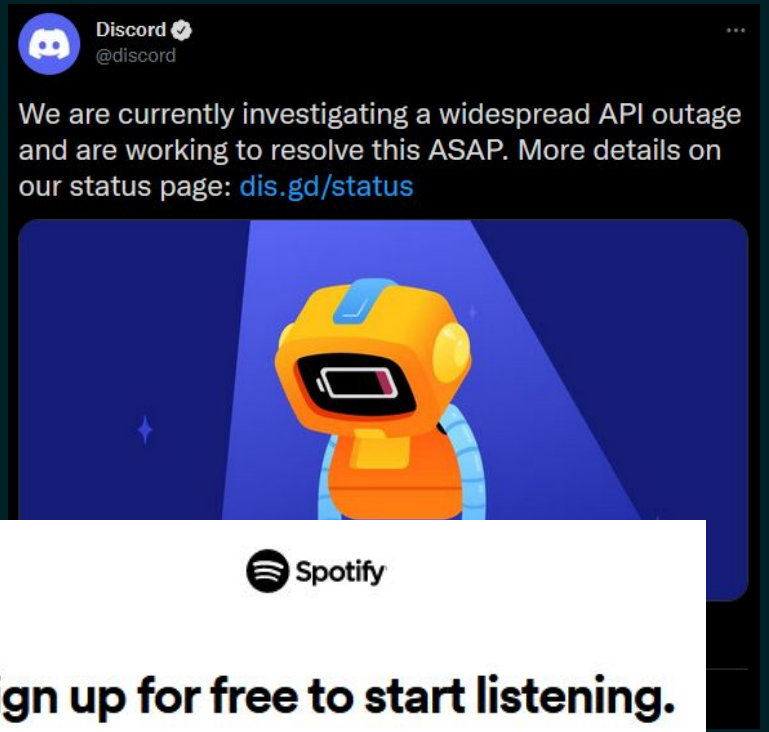

APP

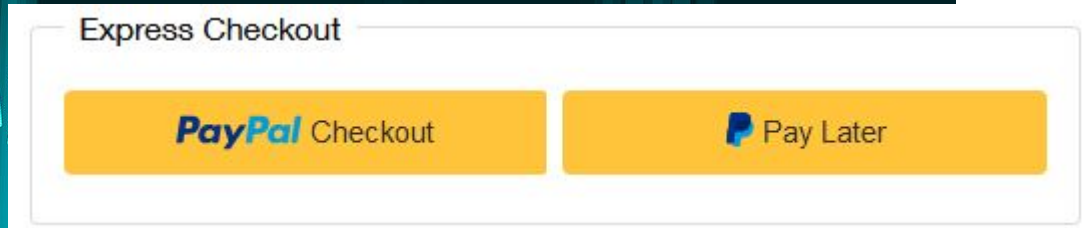
API
DATA API RETURNED
MORE DATA

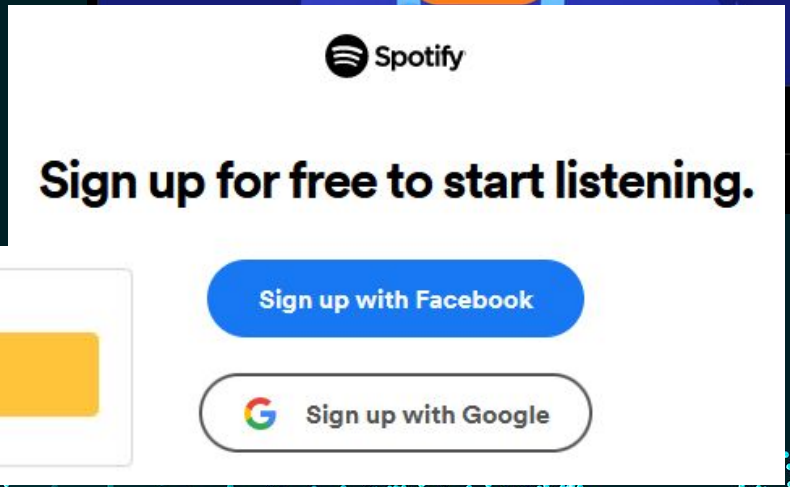

API
YOU
SOMEHOW ALSO YOU
DATA

APIs are ubiquitous







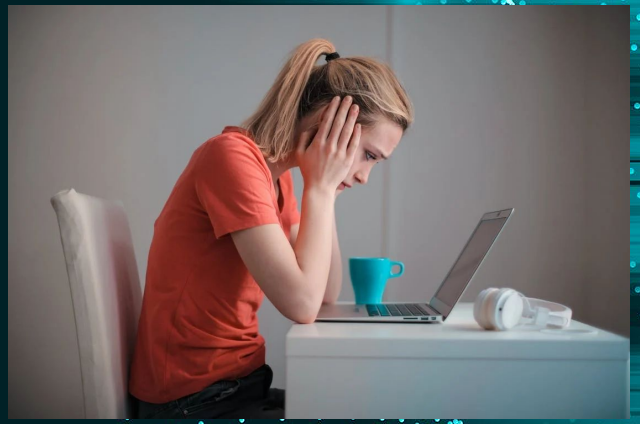


Why use an API?

- Easily access or manipulate data from another service
- Loosely coupled systems → Easy maintenance
- Security
- More agile

How to use an API?

1. Pick an API
2. Obtain an API key
3. Read documentation, make sure you know how to use the API
4. Test the API with Postman or equivalent
5. Implement in code

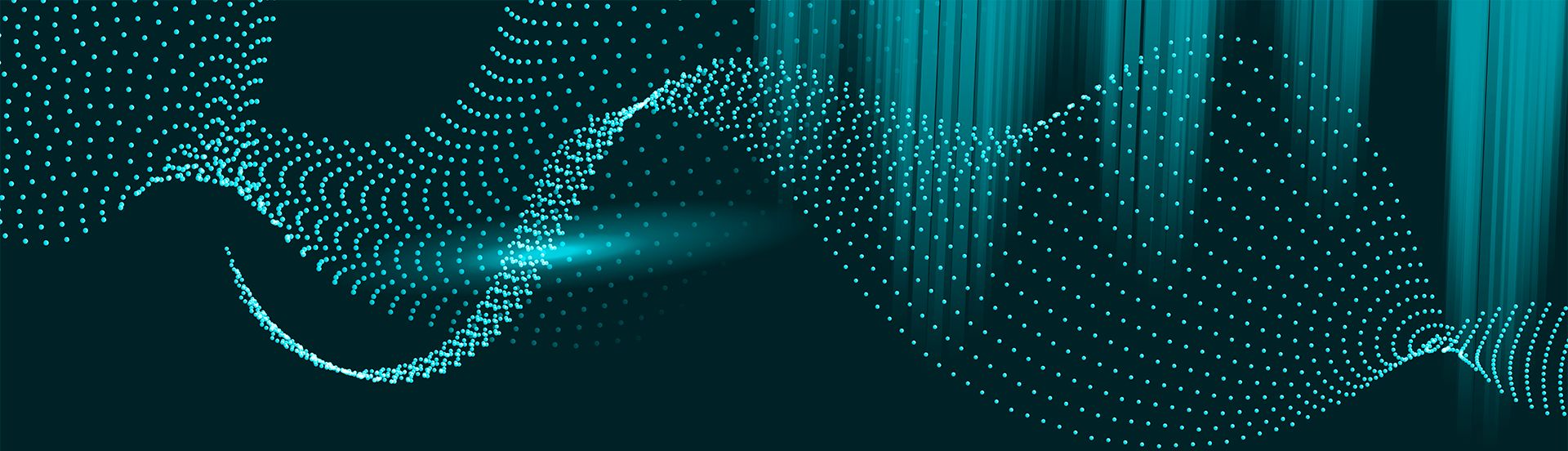


Types of APIs

- REST API
  - REpresentational State Transfer
  - Uniform, simple interface
  - Stateless
- SOAP API
  - Simple Object Access Protocol
  - Slower but more reliable
  - Stricter usage

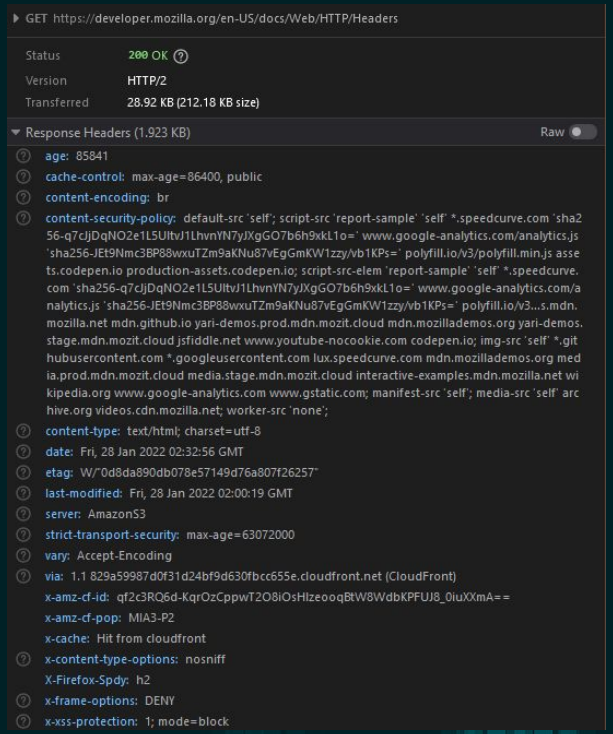
Types of APIs

- GraphQL API
  - Graph Query Language
  - Similar to REST
  - Query exactly what we want
- Webhooks
  - Automated, event-based
  - Check for data changes



02 | REST APIs

HEADERS & BODY



Header - metadata

- API method
- HTTP response code
- Body type accepted

Body - meat and potatoes

- JSON
- XML

COMMON METHODS

GET - Read a specific resource (data) or a collection of resources

POST - Create new resource

PUT - Update the entirety of an existing resource, usually

PATCH - Update part of an existing resource

DELETE - Remove resource

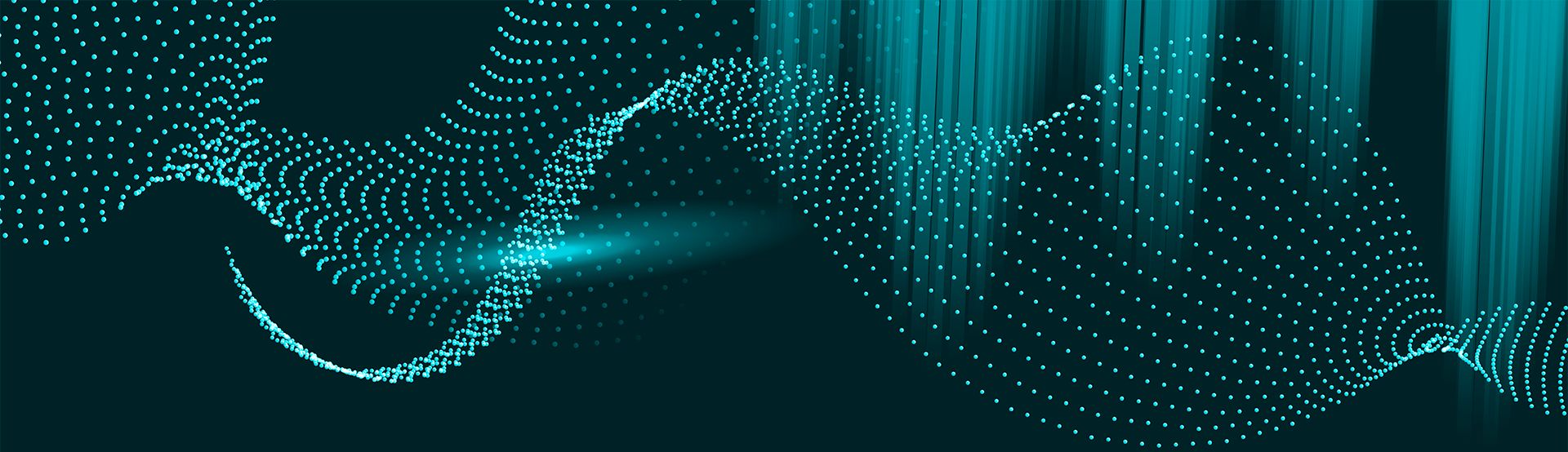
RESPONSE CODES

1xx - Information
2xx - Success
- 200 - Request successful
- 201 - Resource created

3xx - Redirect
- 301 - Resource moved to new URI (location)

4xx - Client Error
- 401 - Unauthorized access
- 404 - Resource not found

5xx - Server Error
- 502 - Bad gateway



03 | Examples

Python

Requests

```
python -m pip install requests
```

Docs: https://docs.python-requests.org/en/latest/

Python

```
import requests

r = requests.get(
  'http://api.weatherapi.com/v1/current.json?
  key=your_key&q=your_query')

print(r.json())
```

JavaScript

Fetch API

Native to every browser except IE

Docs: https://developer.mozilla.org/en-US/docs/Web/API/Fetch_API/Using_Fetch

JavaScript

```
fetch('http://api.weatherapi.com/v1/current.json?
       key=your_key&q=your_query')
  .then(response => response.json())
  .then(data => console.log(data));
```

04 Demonstration

PREREQUISITES

Postman: https://www.postman.com/

- I recommend the desktop client, but the web app should work.

WeatherAPI: https://www.weatherapi.com/

- Create free account and copy your API key from: https://www.weatherapi.com/my/

HERE WE GO