



Traveling Through a Secure API with Python

July, 2021



Hello!

[Auth0](#)

[Pizza de Dados](#)

[Data Bootcamp](#)

[LinkedIn Learning](#)



Jess Temporal

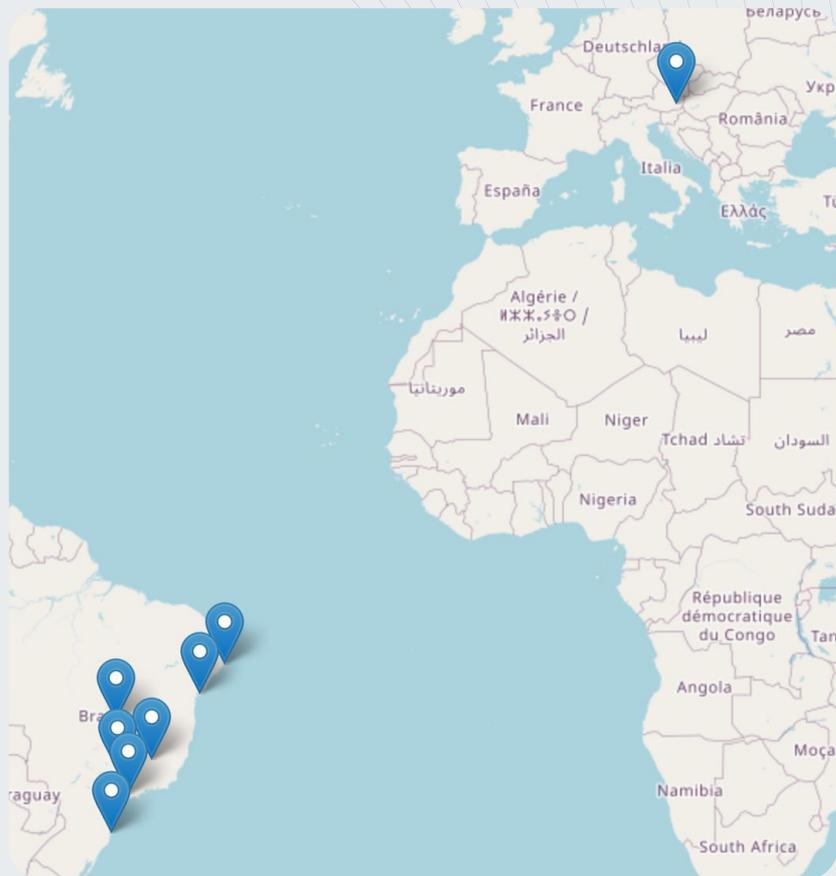
Sr. Developer Advocate

[@jesstemporal](#)

Travelling Through a Secure API with Python and Auth0

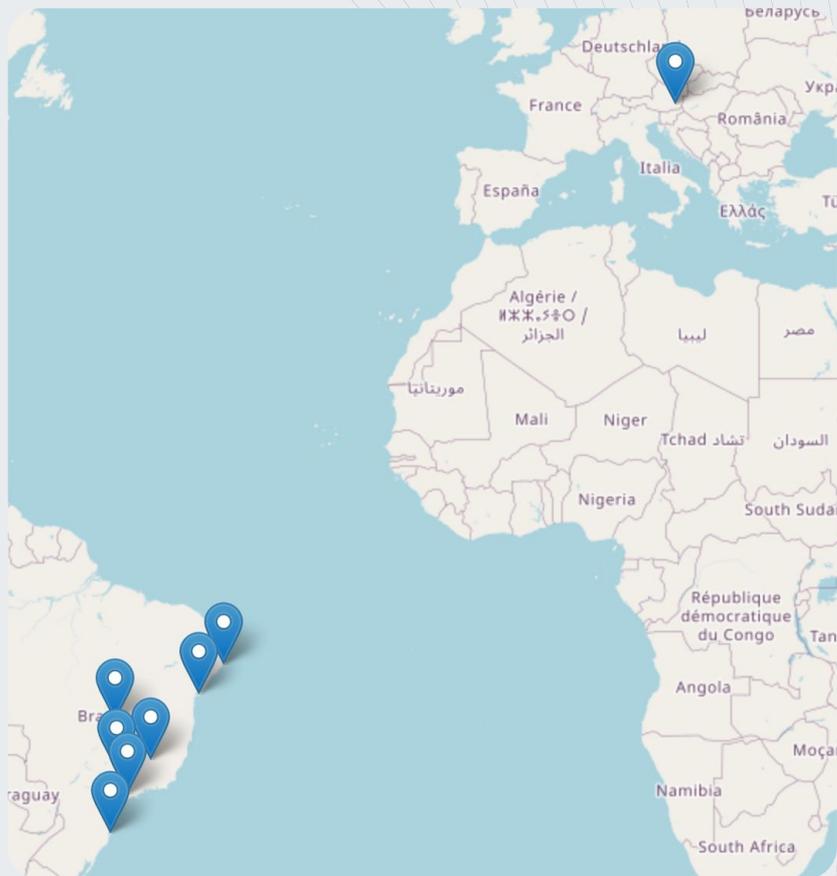


What we will build



What we will build

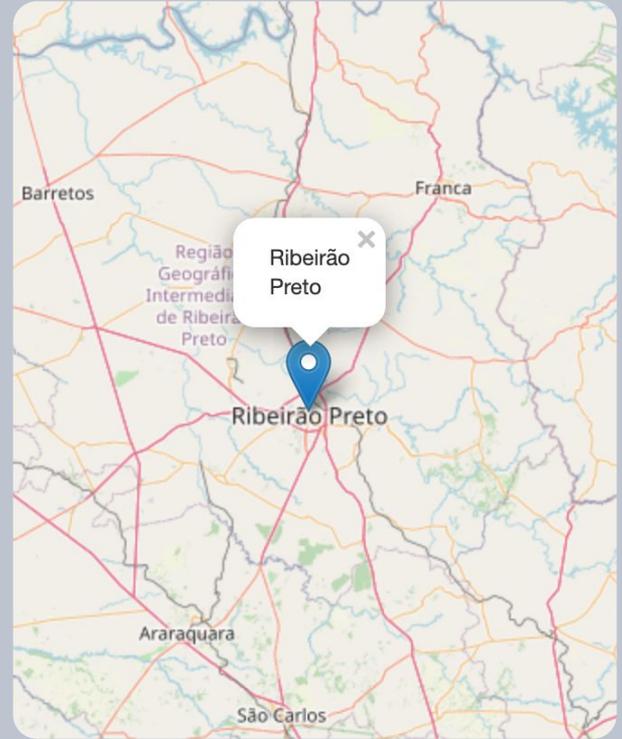
1. 4 endpoints with Flask
2. Some data manipulation with Pandas
3. Protect endpoints with Auth0
4. Deploy to Heroku



Show me the code!

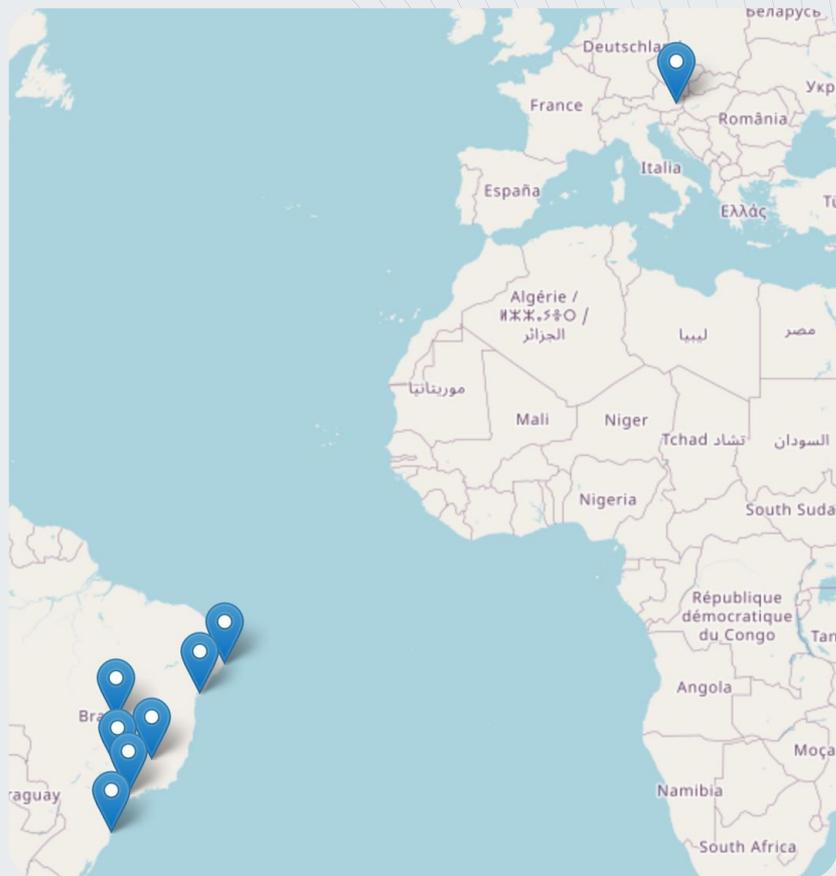


Show me the code!



Basic endpoints

1. GET /
2. GET /oops



Basic endpoints

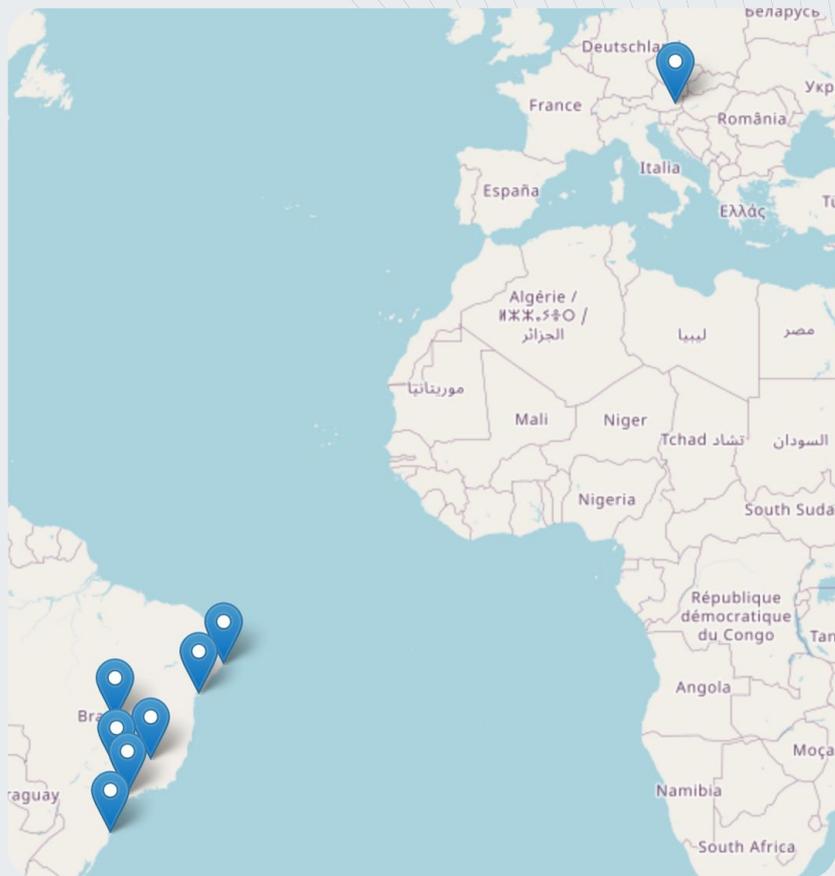
- GET /
- GET /oops

```
app.py > ...
1   from flask import Flask, render_template
2
3
4   app = Flask(__name__)
5
6
7   @app.get('/')
8   def home():
9       return render_template('index.html')
10
11
12  @app.get('/oops')
13  def oops():
14      return render_template('oops.html')
15
```



Protected endpoints

1. GET /
2. GET /oops
3. GET /ping
4. POST /places





Protected endpoints

- GET /
- GET /oops
- **GET /ping**

```
app.py > ...
18
19 @app.get('/ping')
20 def update_map():
21     created = create_map()
22     if created:
23         return render_template('index.html')
24     return redirect(url_for('oops'))
25
```



Protected endpoints

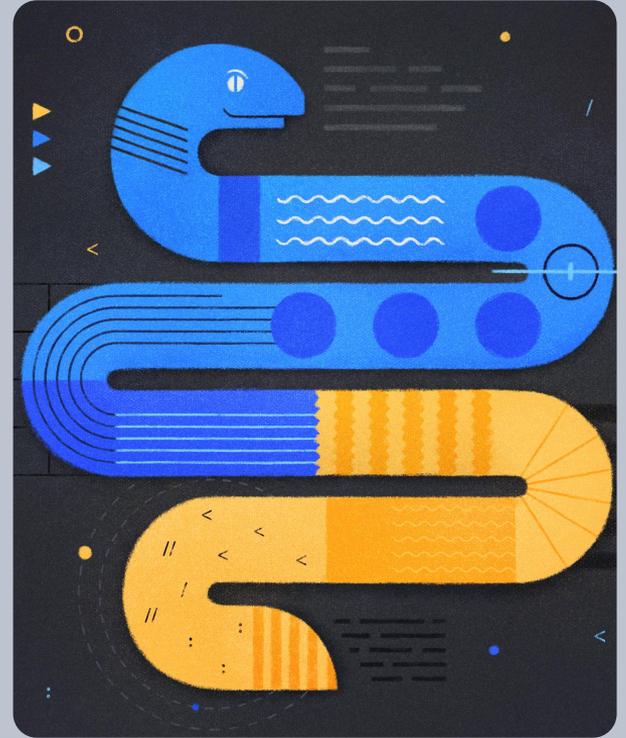
- GET /
- GET /oops
- GET /ping
- **POST /places**

app.py > ...

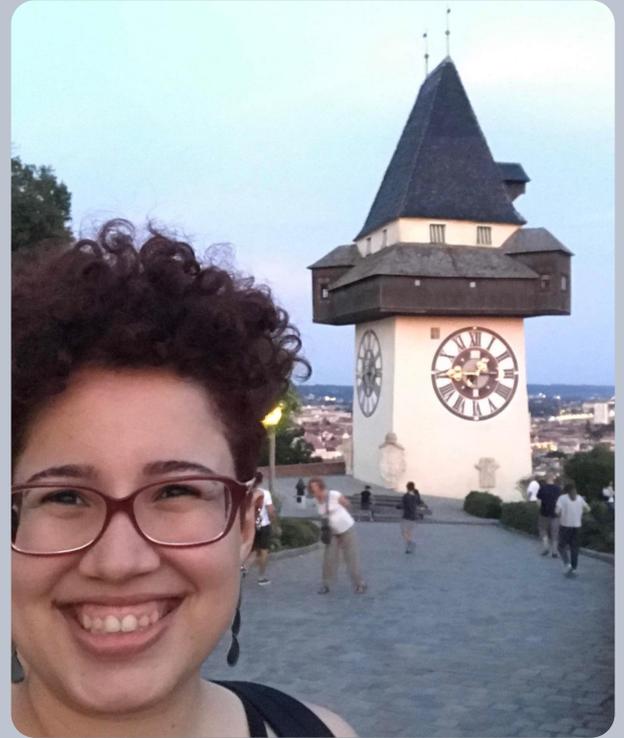
```
26
27     @app.post('/places')
28     def new_place():
29         place_data = request.json
30         create_new_place(place_data)
31         created = create_map()
32         if created:
33             return render_template('index.html')
34         return redirect(url_for('oops'))
35
```



Data Data Data



Data Data Data



Data

 places.csv

```
1 name,latitude,longitude
2 Graz,47.09113253131379,15.475817295884495
3 Taipei,25.031224572388727,121.56835539277961
4 São Paulo,-23.553587531516293,-46.64191552881332
5 Ribeirão Preto,-21.175419814826252,-47.80700041467615
6 Florianópolis,-27.599309445589657,-48.48817975644357
7 Salvador,-12.947243144620645,-38.436411301896534
8 Maceió,-9.641966176203784,-35.73846456565925
9 Belo Horizonte,-19.848295063505297,-43.934907510577496
10 Brasília,-15.765777242405598,-47.90688628657218
```



Loading data

 maps.py > ...

```
def load_data():  
    github = Github(config["github"])  
  
    repository = github.get_user().get_repo(config["repo"])  
    file = repository.get_contents('places.csv')  
  
    return pd.read_csv(StringIO(file.decoded_content.decode()))
```

Create a map

 maps.py > ...

```
def creates_standard_map():  
    center = (13.133932434766733, 16.103938729508073)  
    return folium.Map(location=center, zoom_start=3)
```

Add markers

 maps.py > ...

```
def adds_markers(my_map, dataset):  
    for _, place in dataset.iterrows():  
        folium.Marker(  
            location=[place['latitude'], place['longitude']],  
            popup=place['name'],  
            tooltip=place['name']  
        ).add_to(my_map)  
  
    return my_map
```

Save updated data

maps.py > ...

```
def save_data(dataset):
    github = Github(config["github"])
    repository = github.get_user().get_repo(config["repo"])
    filename = 'places.csv'
    sha = repository.get_contents(filename).sha

    s = StringIO()
    dataset.to_csv(s, index=False)
    content = s.getvalue()

    commit_message = "Update data via PyGithub"
    repository.update_file(filename, commit_message, content, sha)
```

Putting all together

 maps.py > ...

```
def create_map():
    try:
        df = load_data()
        my_map = creates_standard_map()
        marked_map = adds_markers(my_map, df)
        marked_map.save('templates/index.html')
    except:
        return False
    return True
```

Putting all together

 maps.py > ...

```
def create_new_place(place_data):  
    df = load_data()  
    result = df.append(place_data, ignore_index=True)  
    result = result.drop_duplicates(keep=False)  
    save_data(result)
```

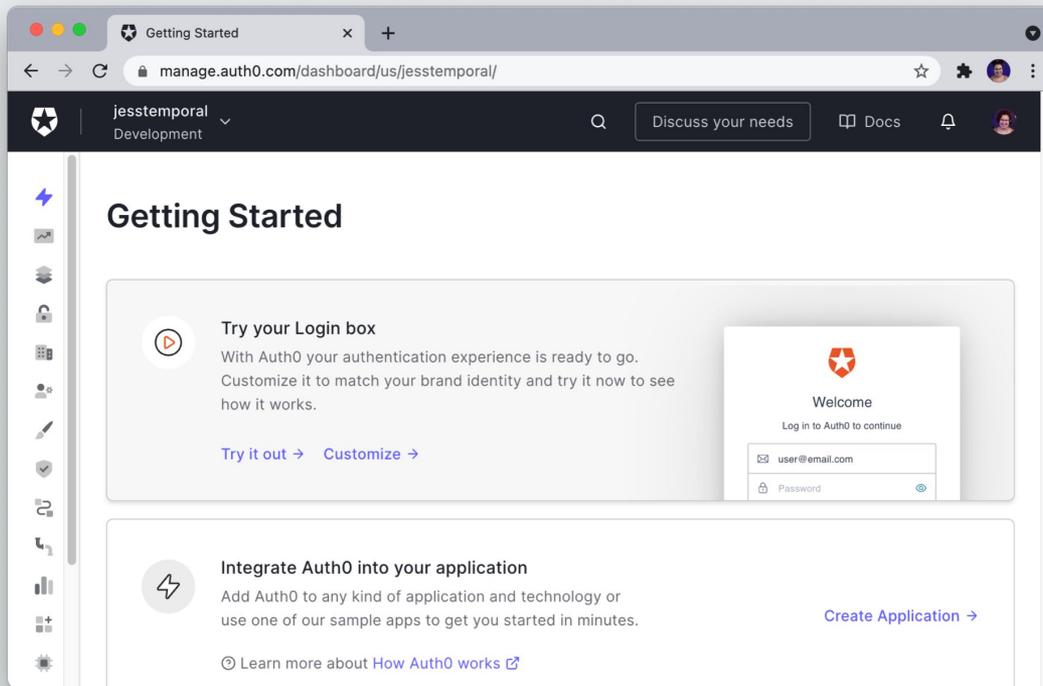
Protection!



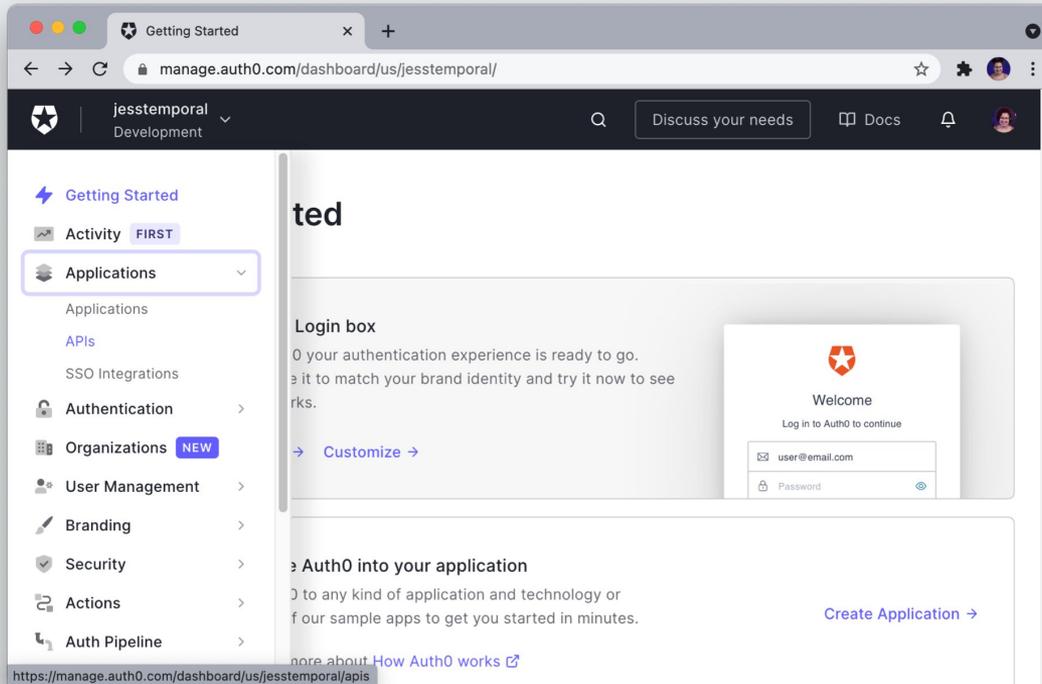
Protection!



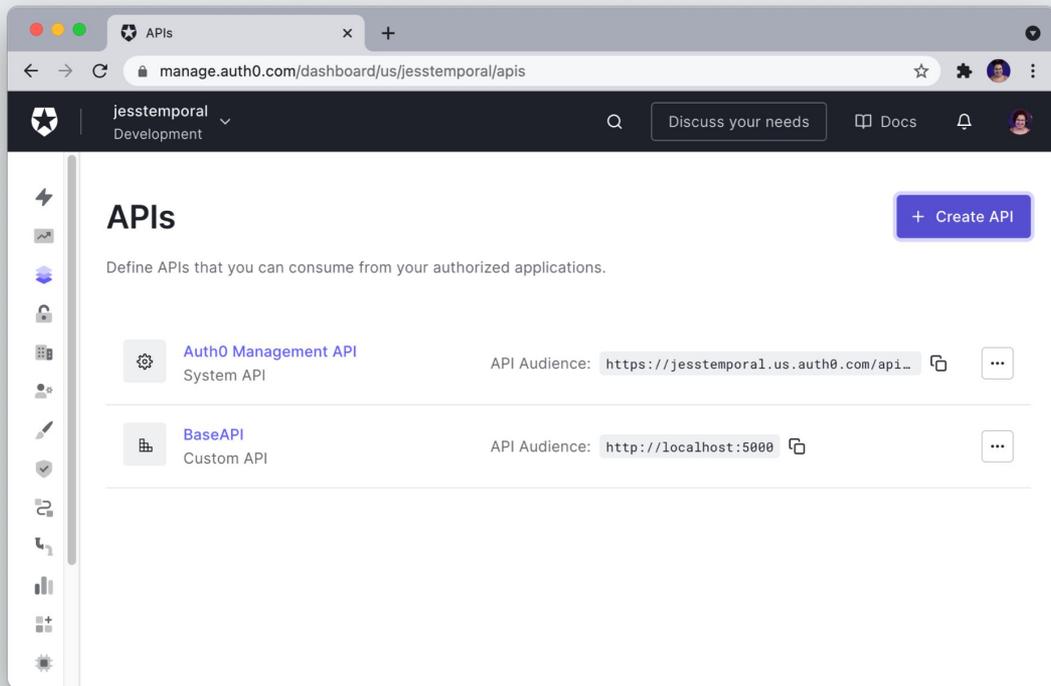
Create an API in Auth0



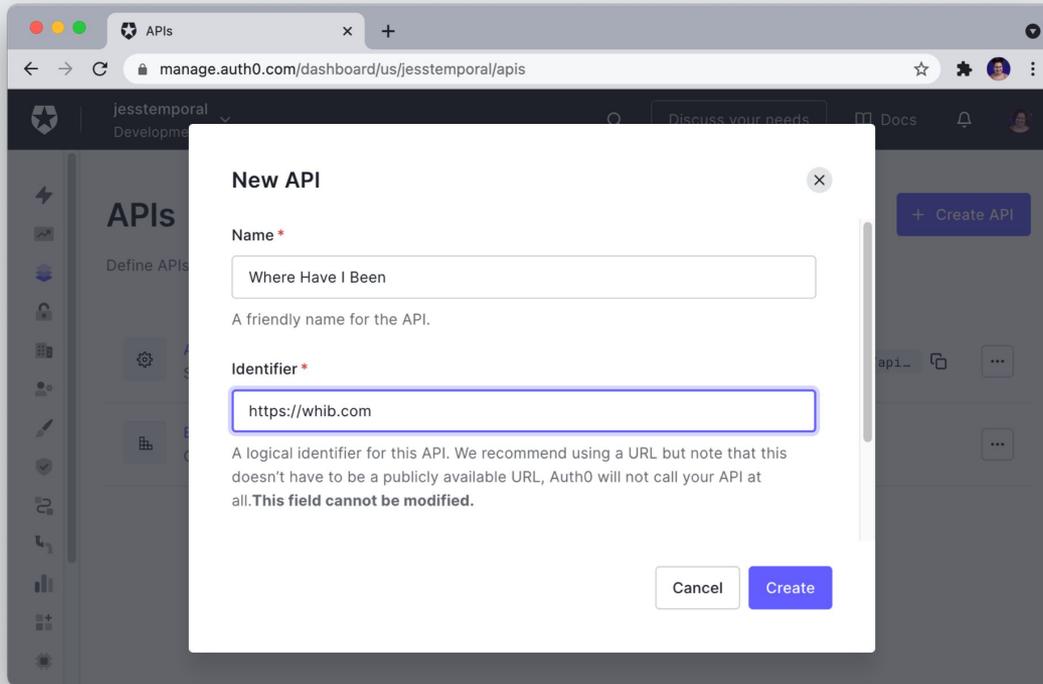
Create an API in Auth0



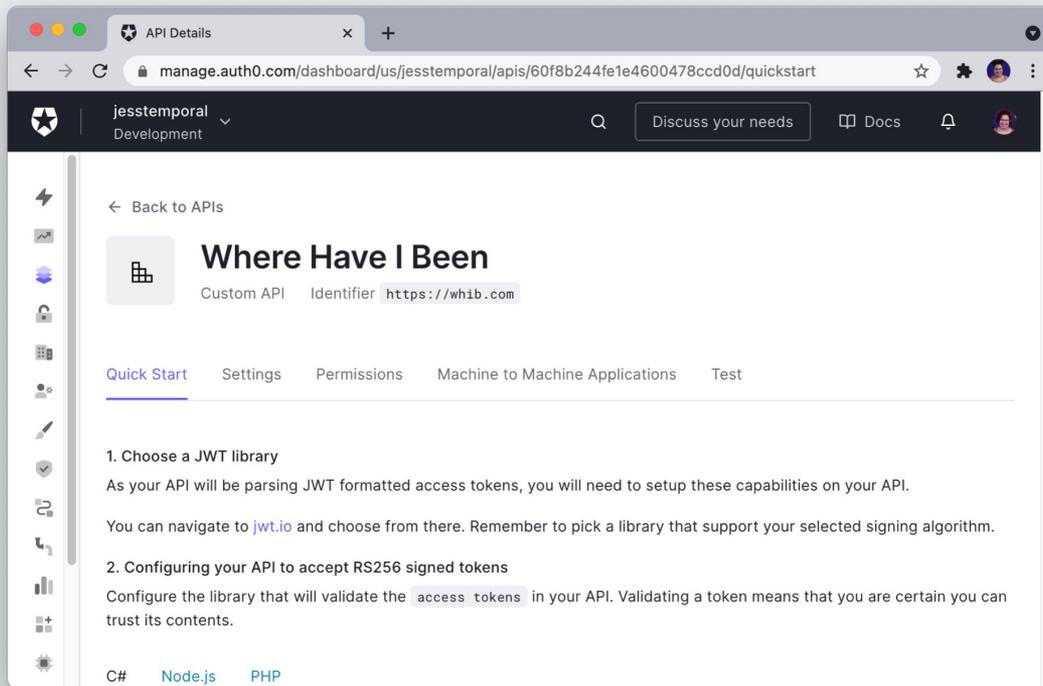
Create an API in Auth0



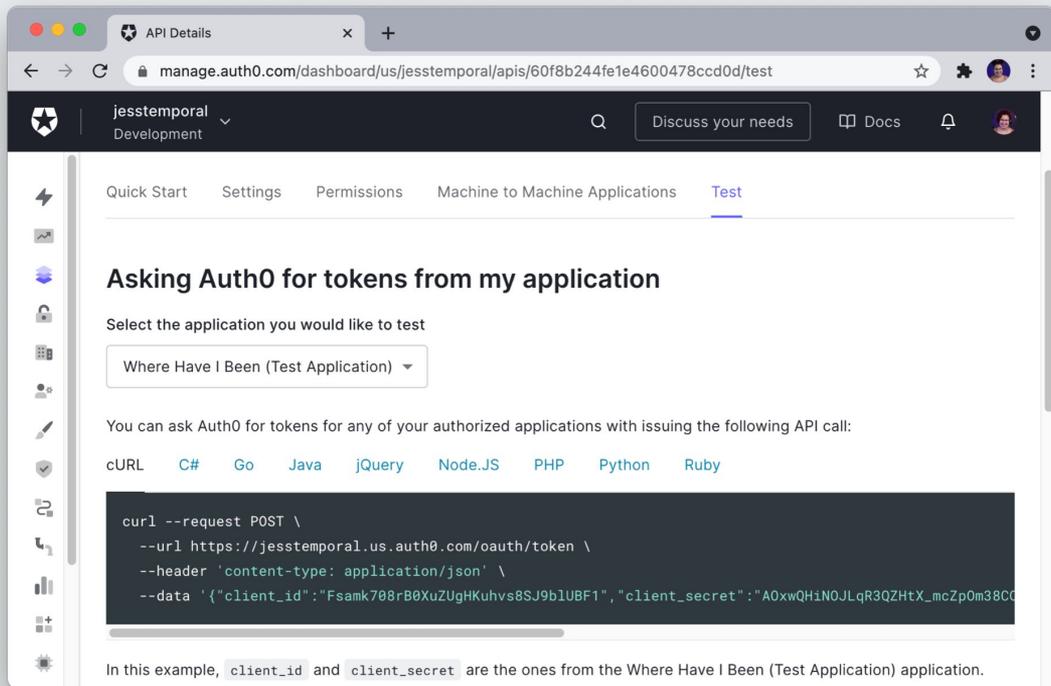
Create an API in Auth0



Create an API in Auth0



Create an API in Auth0



Update the code

 app.py > ...

```
@cross_origin(allow_headers=["Content-Type", "Authorization"])  
@requires_auth
```



Create an API in Auth0

Create the JWT validation decorator

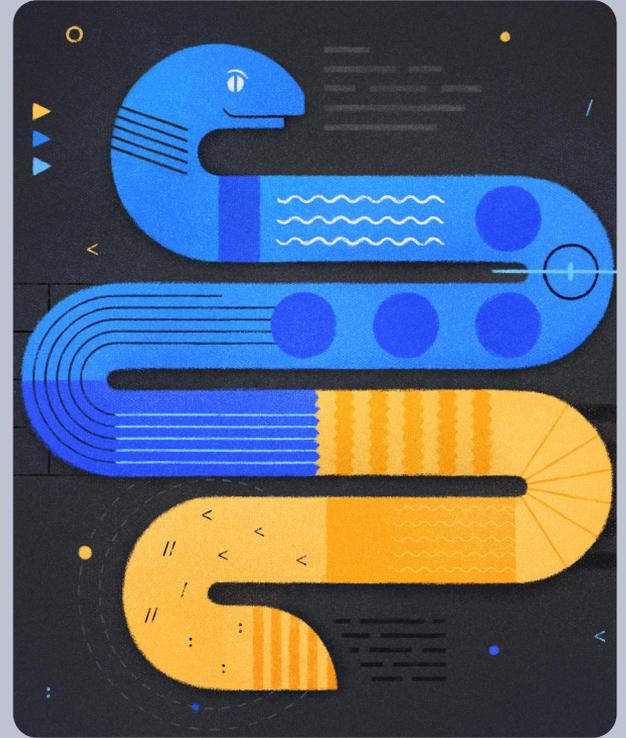
Add a decorator which verifies the Access Token against your JWKS.

```
# /server.py

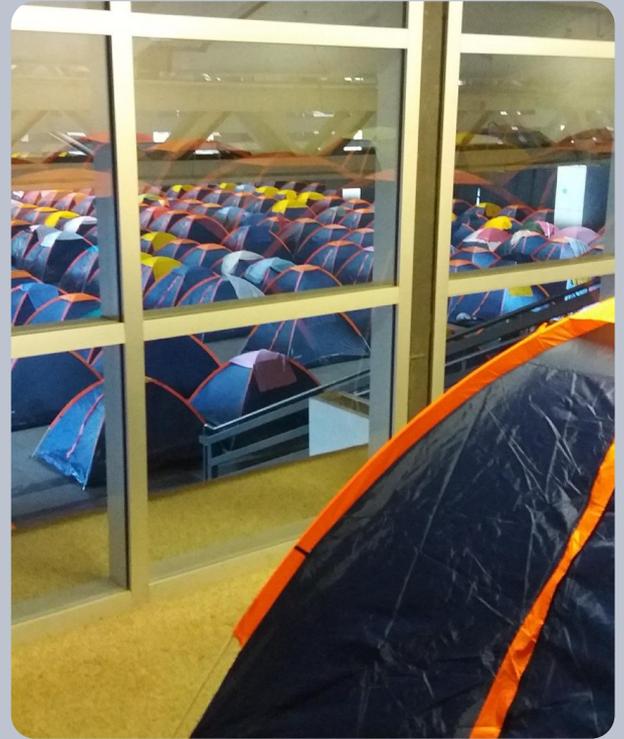
# Format error response and append status code
def get_token_auth_header():
    """Obtains the Access Token from the Authorization Header
    """
```



Deploy time!



Deploy time!



Update the code

 Procfile

```
web: gunicorn app:app
```



Update the code

Procfile

```
web: gunicorn app:app
```

Pipfile

```
[[source]]

url = "https://pypi.python.org/simple"
verify_ssl = true

[packages]

Flask = "2.0.0"
Flask-Cors = "3.0.10"
PyGithub = "1.55"
python-jose = "3.3.0"
folium = "0.12.1"
gunicorn = "20.1.0"
pandas = "1.2.5"

[requires]

python_version = "3.6"
```



Create a new app in Heroku

Install the Heroku CLI

Download and install the [Heroku CLI](#).

If you haven't already, log in to your Heroku account and follow the prompts to create a new SSH public key.

```
$ heroku login
```

Create a new Git repository

Initialize a git repository in a new or existing directory

```
$ cd my-project/  
$ git init  
$ heroku git:remote -a peaceful-sea-89241
```

Deploy your application

Commit your code to the repository and deploy it to Heroku using Git.

```
$ git add .  
$ git commit -am "make it better"  
$ git push heroku master
```



Let's see how it looks!



Travelling Through a Secure API with Python and Auth0

Dashboard / WHIB Talks Edition

Prod WHIB Talks Ed... GET `_.base_url` Send 200 OK 812 ms 11.1 KB

Filter Body Auth Query Header Docs Preview Header 6 Cookie Timeline

- GET Home
- POST Get Auth Token
- GET Generate New Map
- POST Create New Place

Select a body type from above

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Travelling Through a Secure API with Python and Auth0

Dashboard / WHIB Talks Edition

Prod WHIB Talks Ed... | POST | https://jesstemporal.us.auth0.com | Send | 200 OK | 602 ms | 780 B

Filter | JSON | Auth | Query | Header 1 | Preview | Header 20 | Cookie | Timeline

```
1 {"client_id": "_client_id",
2  "client_secret": "_client_secret",
3  "audience": "_audience",
4  "grant_type": "client_credentials"}
```

```
1 {
2   "access_token":
   "eyJhbGciOiJSUzI1NiIsInR5cCI6IkpXVCIsImtpZCI6Im
42T0ZvNVJtbjBwYmxVeXJv0Wns0Sj9.eyJpc3MiOiJodHRw
czovL2p1c3N0ZW1wb3JhbC51cy5hdXR0b3R5b20vIiwic3V
iIjoiz0RtbUtzRlE2cDFGNnA4RwxiVU9iZzdRbzc3RlE2c
BAY2xpZW50cyIsImF1ZCI6Imh0dHA6Ly9sb2NhbGhvc3Q6N
TAWMCI6Imh0dHA6Ly9sb2NhbGhvc3Q6NlE2cDFGNnA4Rwxi
VU9iZzdRbzc3RlE2cDFGNnA4RwxiVU9iZzdRbzc3RlE2c
MzM2L2JhenAiOiJnRG1tS3NGUTZwMUY2cDhFbGJVT2JnN1F
vNzNFZmMzcCI6Imd0eSI6ImNsaWVudC1jcmVkaW50aWZl
J9.1fmwpcR10p9JX01pnSZWE7EsbRvfwfYNTXHI-
cJ5DwQr7AqUldw-
dISA8MA0P71Am0dNEhb8opyz0wMSQZerE-
460fsRspwMhg6xEt4BCdpjN9061v9nFN4cK1p3evtioZ5Re
fqBCW06CBcG99ELFae5C0NNm-H7IdpkBBsprDM0Y-
8uLXn8L6mRkL8E5rANjvQR04yNxnasnkJF5086itCnnkHTM
_gyCqUX8MBzNn8si83TQLQEzNmxKw9Gg0drQ3gAxbwJ5MfI
anoXF1c54mh9Q10nImgGaGY1ZRJ6y7kXq8QcuDCfAXI7hEx
YU-4WVUPeknZzYUVRBdVJ2eTL2A",
3   "expires_in": 86400,
4   "token_type": "Bearer"
5 }
```

Beautify JSON | \$.store.books[*].author



Travelling Through a Secure API with Python and Auth0

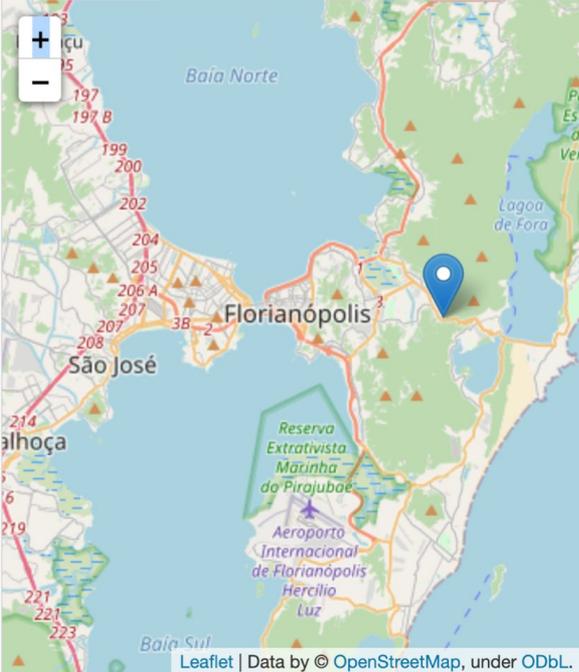
Dashboard / WHIB Talks Edition

Prod WHIB Talks Ed... GET `_.base_url` ping Send 200 OK 2.25 s 11.1 KB

Filter Body Bearer Query Header Docs Preview Header 7 Cookie Timeline

GET Home
POST Get Auth Token
GET Generate New Map
POST Create New Place

TOKEN Response → Body Attribute
PREFIX
ENABLED



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Travelling Through a Secure API with Python and Auth0

The screenshot shows a REST client interface. At the top, it says "Dashboard / WHIB Talks Edition". On the left, there's a sidebar with a menu: "Prod WHIB Talks Ed...", "GET Home", "POST Get Auth Token", "GET Generate New Map", and "POST Create New Place". The main area shows a POST request to "_.base_url/places". The response is a JSON object: {"name": "São José", "latitude": "-27.597724533718875", "longitude": "-48.61495221317449"}. On the right, there are keyboard shortcuts for "Send Request" (⌘Enter), "Focus Url Bar" (⌘L), "Manage Cookies" (⌘K), and "Edit Environments" (⌘E).

Dashboard / WHIB Talks Edition

Prod WHIB Talks Ed... ▾

Filter ▾ + ▾

GET Home

POST Get Auth Token

GET Generate New Map

POST Create New Place

POST ▾ `_.base_url/places` Send

JSON ▾ Bearer ▾ Query Header 1

```
1 {
2   "name": "São José",
3   "latitude": "-27.597724533718875",
4   "longitude": "-48.61495221317449"
5 }
6
```

Send Request ⌘Enter

Focus Url Bar ⌘L

Manage Cookies ⌘K

Edit Environments ⌘E

Beautify JSON



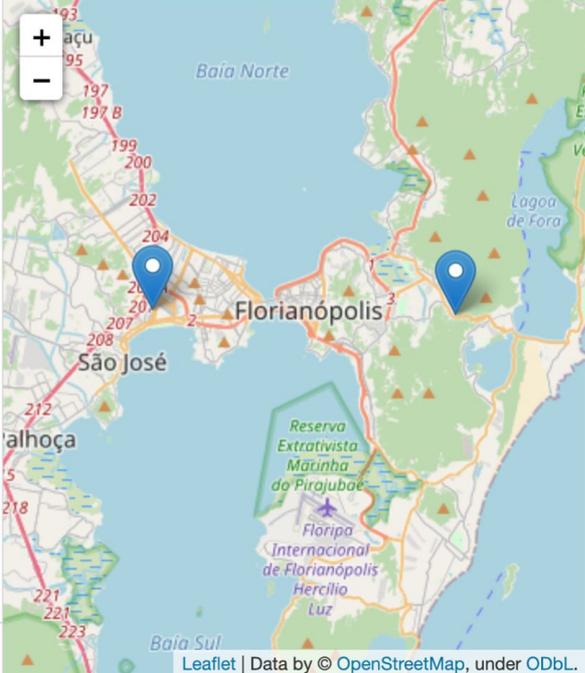
Travelling Through a Secure API with Python and Auth0

Dashboard / WHIB Talks Edition

Prod WHIB Talks Ed... | POST | `_.base_url` places | Send | 200 OK | 2.37 s | 12 KB

Filter | JSON | Bearer | Query | Header 1 | Preview | Header 7 | Cookie | Timeline

```
1 {
2   "name": "São José",
3   "latitude": "-27.597724533718875",
4   "longitude": "-48.61495221317449"
5 }
6
```



Beautifuly JSON

Leaflet | Data by © OpenStreetMap, under ODbL.



That's all for today!

[The code](#)



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