



ScanAPI

Automated Integration Testing and Live Documentation
for your API

Camila Maia

EuroPython 2020



Motivation

Everything started in a week which I as Firefighter 🧯



I work at...



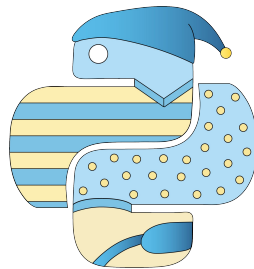
loadsmart





Who am I?

- Brazilian Backend Developer
- Bachelor of Computer Information System
- Coding since 2010
- Python and Ruby
- Events: Pyjamas and EuroPython





Motivation

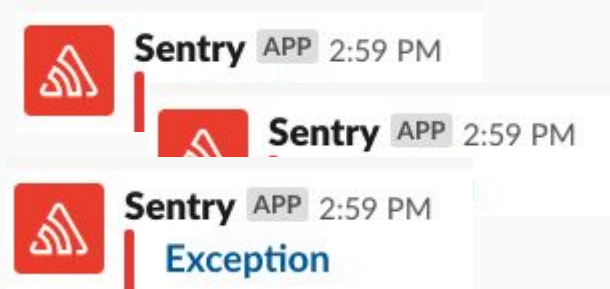
Everything started in a week which I as Firefighter 🧯





Motivation

Integration Errors 🌟



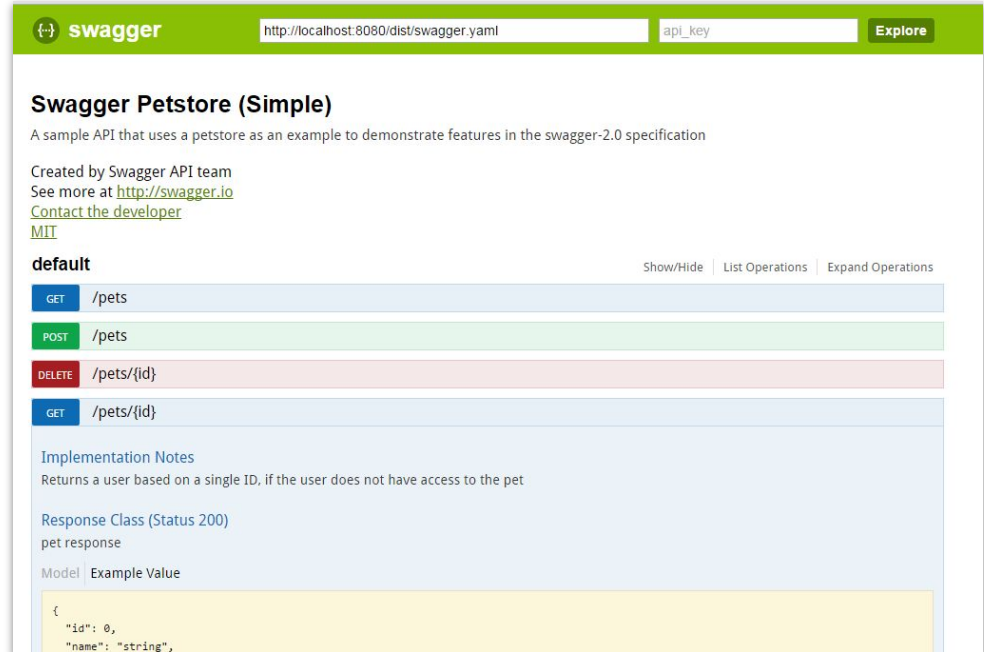
- **Client** sending fields different than what's expected
- **Frontend** receiving fields different than what's expected



Motivation

Outdated documentation 

- Missing endpoints
- Missing fields
- Misinformation



The screenshot shows the Swagger UI for the Swagger Petstore (Simple) API. The interface includes a header with the Swagger logo, the API path `http://localhost:8080/dist/swagger.yaml`, an API key field, and an **Explore** button. The main content area displays the API title **Swagger Petstore (Simple)** and a description: "A sample API that uses a petstore as an example to demonstrate features in the swagger-2.0 specification". It also lists the creator (Swagger API team), a link to <http://swagger.io>, a link to [Contact the developer](#), and the MIT license. Below this, there is a section for **default** operations with links for `Show/Hide`, `List Operations`, and `Expand Operations`. The operations listed are: `GET /pets`, `POST /pets`, `DELETE /pets/{id}`, and `GET /pets/{id}`. The `GET /pets/{id}` operation is expanded to show **Implementation Notes** ("Returns a user based on a single ID, if the user does not have access to the pet"), a **Response Class (Status 200)** ("pet response"), and an **Example Value** in JSON format:

```
{  "id": 0,  "name": "string",
```



Motivation

Hard to recreate scenarios 🤔

22	✖	✖	🛫	🛫	🛫	🛫	🛫	22
23	✖	✖	✖	🛫	✖	✖	✖	23
24	✖	✖	✖	✖	✖	✖	✖	24
25	✖	✖	🛫	🛫	🛫	🛫	🛫	25
26	✖	✖	🛫	🛫	🛫	✖	✖	26
27	✖	✖	🛫	🛫	🛫	✖	✖	27
28	✖	✖	🛫	🛫	🛫	✖	✖	28
29	🛫	✖	🛫	🛫	🛫	🛫	🛫	29
30	🛫	🛫	🛫	🛫	🛫	🛫	🛫	30
31	🛫	🛫	🛫	🛫	🛫	🛫	🛫	31
32	✖	🛫	🛫	🛫	🛫	🛫	🛫	32
33	🛫	🛫	🛫	🛫	🛫	🛫	🛫	33
34	🛫	🛫	🛫	🛫	🛫	🛫	🛫	34
35	🛫	🛫	🛫	🛫	🛫	🛫	🛫	35
36	🛫	🛫	🛫	🛫	🛫	🛫	🛫	36

/reserve/:seat_id

flight_id?

airplane_id?

passenger_id?

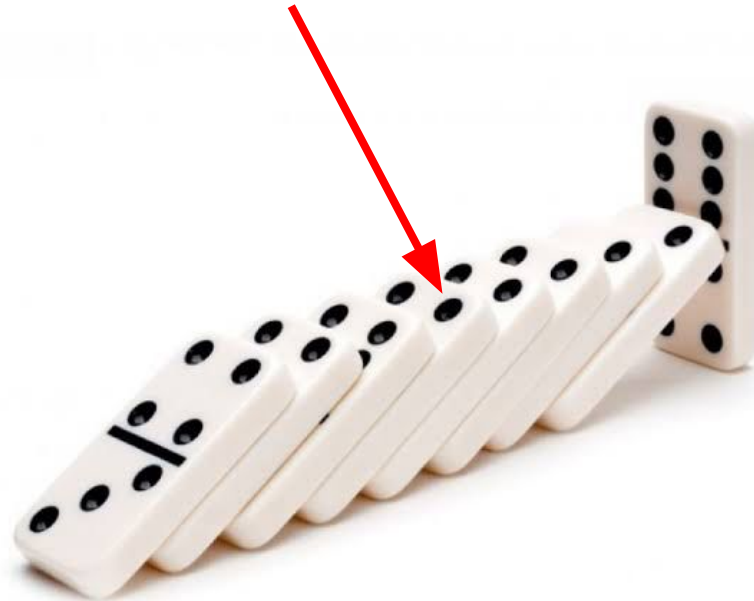
Is the airplane available?

????



Motivation

Hard to recreate scenarios 🙄





ScanAPI





Proposal

- Open Source Framework
 - Written in Python
1. Provide a **Live Documentation**
 2. Tool to implement **integration tests**



How does it work?

Example: PokéAPI

PokéAPI: <https://pokeapi.co>

\$ http <https://pokeapi.co/api/v2/pokemon/>



```
Camila (zsh)
. http https://pokeapi.co/api/v2/pokemon/

HTTP/1.1 200 OK
Accept-Ranges: bytes
Access-Control-Allow-Origin: *
Age: 76523
CF-Cache-Status: HIT
CF-RAY: 5a8771bc5849f3bb-GRU
Cache-Control: public, max-age=86400, s-maxage=86400
Connection: keep-alive
Content-Encoding: gzip
Content-Length: 307
Content-Type: application/json; charset=utf-8
Date: Wed, 24 Jun 2020 15:22:26 GMT
Etag: W/"588-CLnQEEG07GvjWUeCo6AMI5WkCVI"
Expect-CT: max-age=604800, report-uri="https://report-uri.cloudflare.com/cdn-cgi/beacon/expect-ct"
Function-Execution-Id: hn57v2he8yjm
Server: cloudflare
Set-Cookie: __cfduid=d0f11f50efed21ad3b865e6d9485d2c9b1593012146; expires=Fri, 24-Jul-20 15:22:26 GMT; path=/; domain=.pokeapi.co; HttpOnly; SameSite=Lax; Secure
Vary: Accept-Encoding,cookie,need-authorization, x-fh-requested-host, accept-encoding
X-Cache: MISS
X-Cache-Hits: 0
X-Cloud-Trace-Context: 1d34ecf5897dde868053e7d359bd7128;o=1
X-Powered-By: Express
X-Served-By: cache-gru17144-GRU

Camila (zsh) %1 Camila (zsh) %2 +
```



```
Camila (zsh)
X-Timer: S1590537640.140424,VS0,VE576
cf-request-id: 03888569b70000f3bb281f0200000001

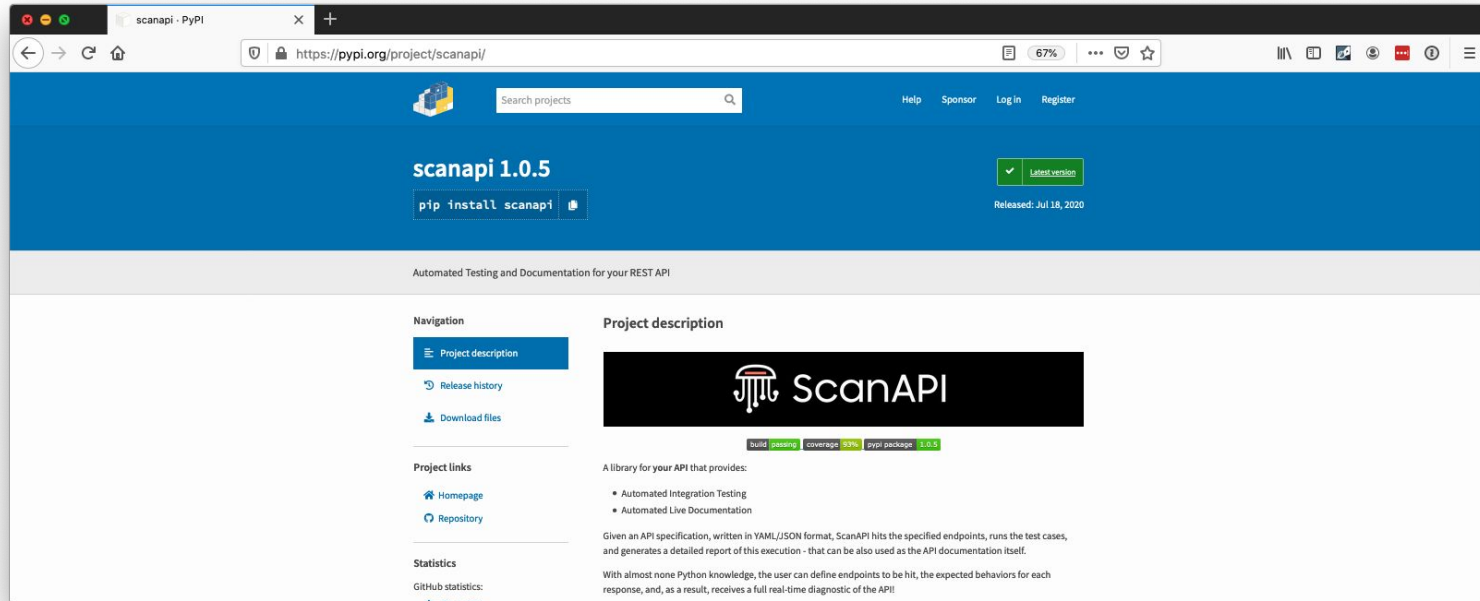
{
  "count": 964,
  "next": "https://pokeapi.co/api/v2/pokemon/?offset=20&limit=20",
  "previous": null,
  "results": [
    {
      "name": "bulbasaur",
      "url": "https://pokeapi.co/api/v2/pokemon/1/"
    },
    {
      "name": "ivysaur",
      "url": "https://pokeapi.co/api/v2/pokemon/2/"
    },
    {
      "name": "venusaur",
      "url": "https://pokeapi.co/api/v2/pokemon/3/"
    },
    {
      "name": "charmander",
      "url": "https://pokeapi.co/api/v2/pokemon/4/"
    },
    {
      "name": "charmeleon",
      "url": "https://pokeapi.co/api/v2/pokemon/5/"
    }
  ]
}
```



How does it work?

Example: PokéAPI

Installing: `$ pip install scanapi`





How does it work?

Example: PokéAPI

```
# api.yaml

api:
  endpoints:
    - name: pokeapi
      path: https://pokeapi.co/api/v2/
      endpoints:
        - name: pokemon
          path: pokemon
          requests:
            - name: list_all
              method: get
              path: /
```




How does it work?

Example: PokéAPI

Running

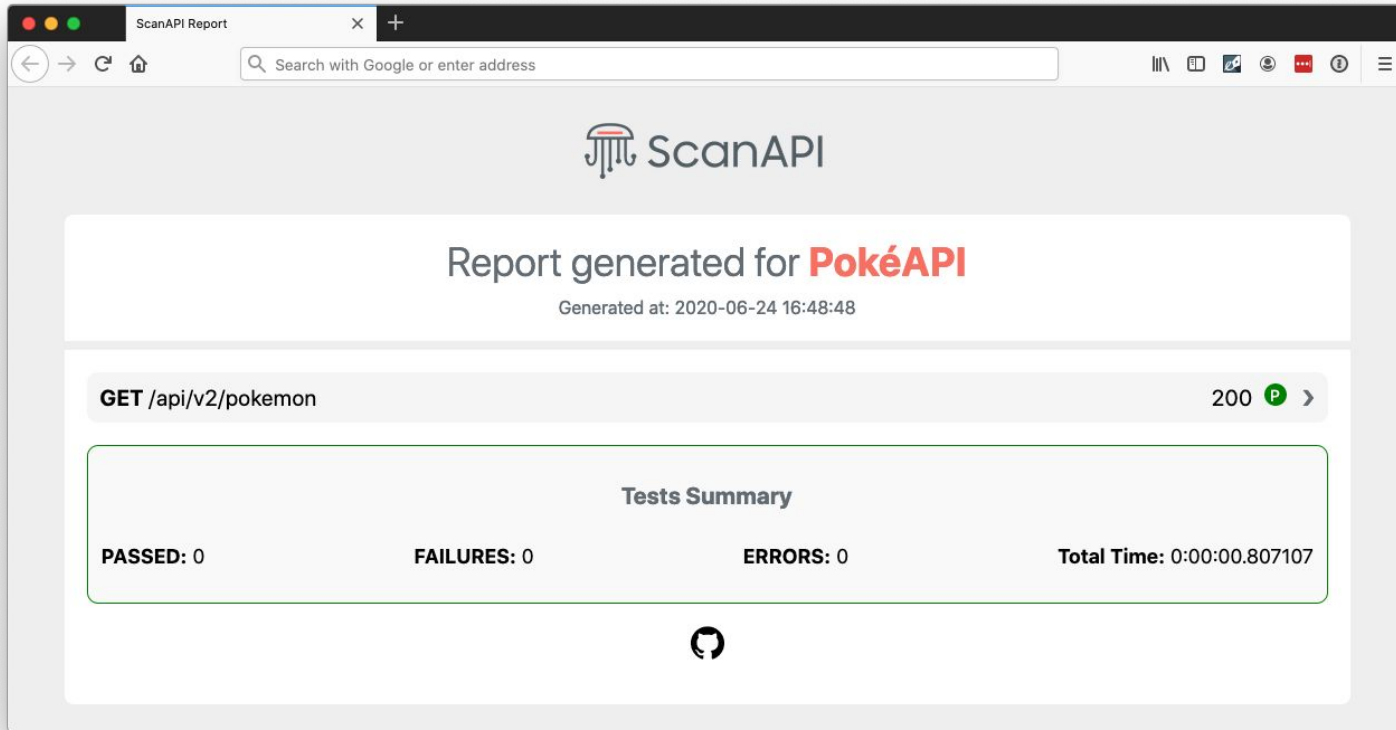
```
Camila (zsh)
(scanner)
scanapi-org/scanapi-examples/pokeapi master x 8d
> scanapi api.yaml
Loading file .scanapi.yaml
Loading file api.yaml
Writing documentation
Making request GET https://pokeapi.co/api/v2/pokemon

The documentation was generated successfully.
It is available at scanapi-report.html
(scanner)
scanapi-org/scanapi-examples/pokeapi master x 8d
> |
```



How does it work?

Documentation 



The screenshot shows a web browser window displaying a ScanAPI report. The browser's address bar shows "ScanAPI Report" and a search bar with the text "Search with Google or enter address". The report header features the ScanAPI logo and the text "Report generated for PokéAPI" in red, with a timestamp "Generated at: 2020-06-24 16:48:48". Below this, a request summary shows "GET /api/v2/pokemon" with a status of "200" and a green "P" icon. A "Tests Summary" box contains the following data:

Tests Summary			
PASSED: 0	FAILURES: 0	ERRORS: 0	Total Time: 0:00:00.807107

At the bottom of the report, there is a GitHub logo.



ScanAPI Report

Search with Google or enter address 90%

Generated at: 2020-06-24 11:55:51

GET /api/v2/pokemon 200 P

REQUEST

Full URL: <https://pokeapi.co/api/v2/pokemon>

Header	Value
User-Agent	python-requests/2.22.0
Accept-Encoding	gzip, deflate
Accept	*/*
Connection	keep-alive
Content-Length	2
Content-Type	application/json

▼ **cURL**

```
curl -X GET -H 'Accept: */*' -H 'Accept-Encoding: gzip, deflate' -H 'Connection: keep-alive' -H 'Content-Length: 2' -H 'Content-Type: application/json' -H 'User-Agent: python-requests/2.22.0' -d '{}' https://pokeapi.co/api/v2/pokemon
```



ScanAPI Report

Search with Google or enter address 67%

RESPONSE

status code	200
response time	0.197517 s
redirect	False

▼ Headers

Header	Value
Date	Wed, 24 Jun 2020 14:55:51 GMT
Content-Type	application/json; charset=utf-8
Content-Length	307
Connection	keep-alive
Set-Cookie	__cfduid=da0df8ac41afc32dd8e635ae8390d895e1593010551; expires=Fri, 24-Jul-20 14:55:51 GMT; path=/; domain=.pokeapi.co; HttpOnly; SameSite=Lax; Secure
Access-Control-Allow-Origin	*
Cache-Control	public, max-age=86400, s-maxage=86400
Content-Encoding	gzip
Etag	W/"587-wNEYLOLw72/bLM+AQQtq8llbna/E"
Function-Execution-Id	98p1mn35rht3
X-Cloud-Trace-Context	78467741e334d7997bc9b06e81979490
X-Powered-By	Express
X-Served-By	cache-gy17124-CDU



ScanAPI Report

Search with Google or enter address 67%

RESPONSE

status code	200
response time	0.197517 s
redirect	False

► Headers

▼ Content

```
{
  "count": 964,
  "next": "https://pokeapi.co/api/v2/pokemon?offset=20&limit=20",
  "previous": null,
  "results": [
    {
      "name": "bulbasaur",
      "url": "https://pokeapi.co/api/v2/pokemon/1/"
    },
    {
      "name": "ivysaur",
      "url": "https://pokeapi.co/api/v2/pokemon/2/"
    },
    {
      "name": "venusaur",
      "url": "https://pokeapi.co/api/v2/pokemon/3/"
    },
    {
      "name": "charmander",
      "url": "https://pokeapi.co/api/v2/pokemon/4/"
    },
    {
      "name": "charmeleon",
      "url": "https://pokeapi.co/api/v2/pokemon/5/"
    },
    {
      "name": "charizard",
      "url": "https://pokeapi.co/api/v2/pokemon/6/"
    },
    {
      "name": "squirtle",
      "url": "https://pokeapi.co/api/v2/pokemon/7/"
    },
    {
      "name": "wartortle",
      "url": "https://pokeapi.co/api/v2/pokemon/8/"
    },
    {
      "name": "blastoise",
      "url": "https://pokeapi.co/api/v2/pokemon/9/"
    },
    {
      "name": "caterpie",
      "url": "https://pokeapi.co/api/v2/pokemon/10/"
    },
    {
      "name": "metapod",
      "url": "https://pokeapi.co/api/v2/pokemon/11/"
    },
    {
      "name": "butterfree",
      "url": "https://pokeapi.co/api/v2/pokemon/12/"
    },
    {
      "name": "weedle",
      "url": "https://pokeapi.co/api/v2/pokemon/13/"
    },
    {
      "name": "kakuna",
      "url": "https://pokeapi.co/api/v2/pokemon/14/"
    },
    {
      "name": "beedrill",
      "url": "https://pokeapi.co/api/v2/pokemon/15/"
    },
    {
      "name": "pidgey",
      "url": "https://pokeapi.co/api/v2/pokemon/16/"
    },
    {
      "name": "pidgeotto",
      "url": "https://pokeapi.co/api/v2/pokemon/17/"
    },
    {
      "name": "pidgeot",
      "url": "https://pokeapi.co/api/v2/pokemon/18/"
    },
    {
      "name": "rattata",
      "url": "https://pokeapi.co/api/v2/pokemon/19/"
    },
    {
      "name": "raticate",
      "url": "https://pokeapi.co/api/v2/pokemon/20/"
    }
  ]
}
```

TESTS

Tests Summary

PASSED: 0	FAILURES: 0	ERRORS: 0	Total Time: 0:00:00
------------------	--------------------	------------------	----------------------------

🔄



How does it work?

Integration tests ✓

...

requests:

- name: list_all

method: get

path: /

tests:

- name: status_code_is_200

assert: \${{ response.status_code == 200 }}

- name: response_time_is_under_half_second

assert: \${{ response.elapsed.total_seconds() < 0.5 }}

- name: count_is_964

assert: \${{ response.json()["count"] == 964 }}

```
{
  "count": 964,
  "next": "https://pokeapi.co/api/v2/pokemon?offset=20&limit=20",
  "previous": null,
  "results": [
    {
      "name": "bulbasaur",
      "url": "https://pokeapi.co/api/v2/pokemon/1/"
    },
  ],
}
```

<https://requests.readthedocs.io>



ScanAPI Report

Search with Google or enter address

response time	0.230083 s
redirect	False

► Headers

► Content

TESTS


[PASSED] pokeapi::pokemon::list_all::status_code_is_200

[PASSED] pokeapi::pokemon::list_all::response_time_is_under_half_second

[PASSED] pokeapi::pokemon::list_all::count_is_equals_to_964

Tests Summary

PASSED: 3	FAILURES: 0	ERRORS: 0	Total Time: 0:00:00.611139
------------------	--------------------	------------------	-----------------------------------





How does it work?

Chaining Requests ☿

- Get details of a Pokémon
- In this case, the data is “static”, but it might not be.
- <https://pokeapi.co/api/v2/pokemon/bulbasaur>



How does it work?

Chaining requests ☿☿

requests:

- name: `pokemon`

path: `pokemon`

requests:

- name: `list_all`

method: `get`

path: `/`

vars:

`pokemon_name: ${ response.json() ["results"] [0] ["name"] }`

tests: `...`

- name: `details`

method: `get`

path: `${pokemon_name}`



`pokemon/${pokemon_name}`

```
{
  "count": 964,
  "next": "https://pokeapi.co/api/v2/pokemon?offset=20&limit=20",
  "previous": null,
  "results": [
    {
      "name": "bulbasaur",
      "url": "https://pokeapi.co/api/v2/pokemon/1/"
    },
  ],
}
```



ScanAPI Report

Search with Google or enter address

ScanAPI


Report generated for **PokéAPI**

Generated at: 2020-06-24 15:46:48

GET /api/v2/pokemon	200	P	>
GET /api/v2/pokemon/bulbasaur	200	P	>

Tests Summary

PASSED: 3	FAILURES: 0	ERRORS: 0	Total Time: 0:00:00.601009
------------------	--------------------	------------------	-----------------------------------





Adding ScanAPI to a project

```
~/my_project/scanapi
└─ ls -la
total 16
drwxr-xr-x  4 camilamaia  staff  128 Jul 20 21:49 .
drwxr-xr-x  3 camilamaia  staff   96 Jul 20 21:49 ..
-rw-r--r--  1 camilamaia  staff    1 Jul 20 21:48 .scanapi.yaml
-rw-r--r--  1 camilamaia  staff    1 Jul 20 21:47 api.yaml
```



Adding ScanAPI to a project

📁 [REDACTED] > 🌿 master > 🌿 main > 📄 scanapi (995)

📄 scanapi ✔ SUCCESS

Duration / Finished

🕒 15s / 20d ago

Queued

⌚ 0s

Executor

🐳 Docker Medium ⓘ

Commit

🔑 [REDACTED]

Branch

🌿 master

Author

 Camila Maia

STEPS TESTS **ARTIFACTS**

▾ 📦 Parallel Run 0

[scanapi/report.html](#)



```
...
scanapi:
  docker:
    - image:
camilamaia/scanapi:1.0.5
  steps:
    - checkout
    - run:
      name: Run ScanAPI
      command: |
        scanapi scanapi/api.yaml
        -c scanapi/.scanapi.yaml
        -o scanapi/report.html
    - store_artifacts:
      path: scanapi/report.html
```

```
workflows:
version: 2
main:
  jobs:
    - scanapi:
      filters:
        branches:
          only:
            - master
    - build-push:
      name: build-push-staging
      env: staging
      requires:
        - scanapi
      filters:
        branches:
          only:
            - master
```



How does it work?

And there is more 🎉

- Language-independent
- It also accepts API spec in JSON
- Environment variables
- Hide sensitive info in the report
- Multiple files API specification
- Custom templates



Can I start using it?

For sure! 👍

The screenshot shows a Twitter post from the account ScanAPI (@scanapi_). The post text reads: "We are super happy to announce that today we released the version 1.0.0! 🎉👏👏 [github.com/scanapi/scanapi...](https://github.com/scanapi/scanapi) Now you can start using safely ScanAPI! With ScanAPI, you can define endpoints to be hit, the expected behaviours, and as result, receive a full real-time diagnostic of your API!". Below the text is a link to the GitHub repository. The post has 2 retweets and 4 likes. The right sidebar contains a "New to Twitter?" section with a "Sign up" button, a "Relevant people" section featuring ScanAPI with a "Follow" button, and a "What's happening" section with a tweet about COVID-19 and a hashtag #LavarParaCuidar.



The screenshot shows a web browser window with the URL `https://scanapi.dev/docs_v1/basic_structure.html`. The page has a dark header with the ScanAPI logo and navigation links for Home, Docs, and Tutorial. A left sidebar contains a 'Specification' section with 'Basic Structure' highlighted in red, and a 'Configuration' section with 'Configuration File' listed below it. The main content area is titled 'Basic Structure' and contains the following text:

You can write ScanAPI specifications in YAML or JSON. In this guide, we use only YAML examples but JSON works equally well.

A sample ScanAPI specification written in YAML looks like:

```
api:
  endpoints:
    - name: sample-api
      path: http://api.example.com/v1
      requests:
        - name: users
          path: /users
          method: get
      tests:
        - name: status_code_is_200
          assert: $
```

This specification follows a tree structure.

One value defined in a node will propagate to it's children, concatenating the values.

In the example above, for instance, the final path of the request will be:



Next Steps

What about the future? 🌐

- Missing HTTP methods (current: GET, POST, PUT, PATCH, DELETE)
- JSON visualization
- Docs + Tutorials
- Website improvements
- GitHub Action

And what if....

- OpenAPI



Why to contribute?

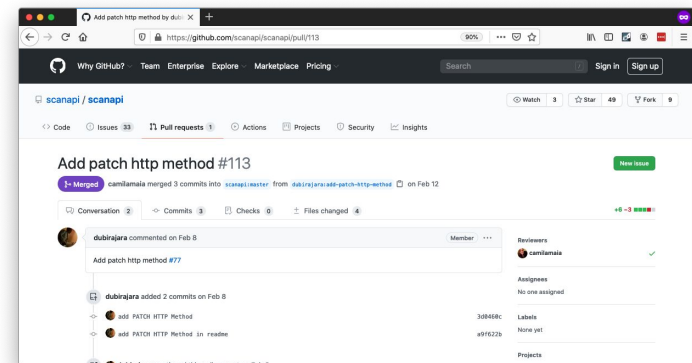
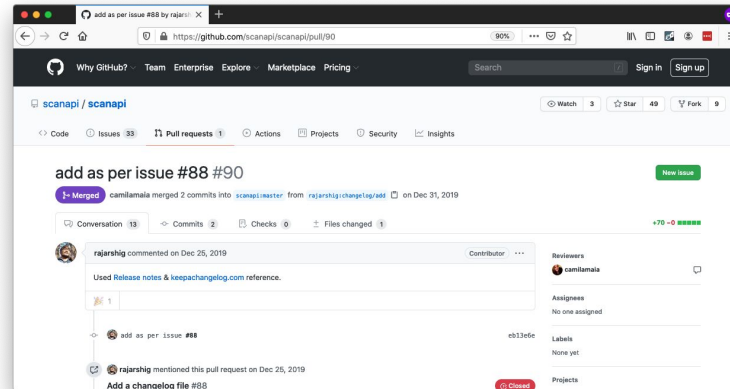
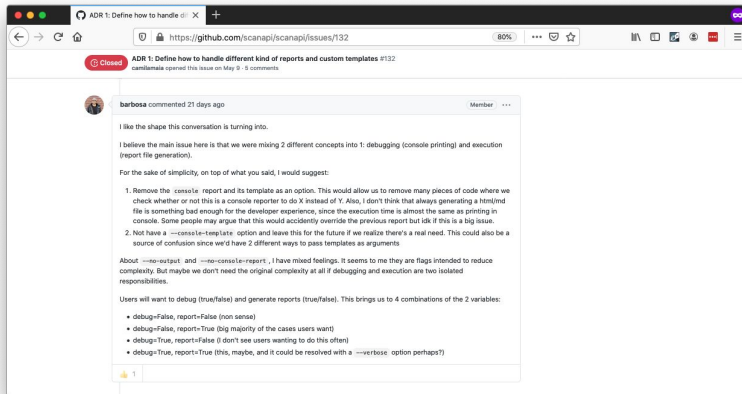
Join us! 

- Backend, frontend, automation, design
- “Pure Python”
- Understand how a lib works
- Test coverage > 90%
- Issues with labels – i.e: good first issue



Why to contribute?

Join us! 



[How Open Source Changed My Life with Max Stoiber](#)



Sprint Session

What is a "Sprint" ?

Most open source software development happens on the web and developers usually communicate online only when working on projects. This usually works out fine, but the lack of live meetings can sometimes be a limiting factor in making good progress.

For this reason, a form of impromptu coding meetups called "**sprints**" or "**hackathons**" (outside the Python community, the term "hackathon" is more common) were initiated, where developers interested in a project can get together for a short period of time to make quick progress. Since conferences provide the perfect occasion to meet, sprints are made part of the conference program.



Pictures of sprints from EuroPython 2018 and 2019 (in-person events)

- Sprint session on this weekend - July 25th and 26th (free!)

[#sprint-scanapi](#)
[More information](#)

github.com/scanapi



 scanapi / scanapi

 Unwatch ▾

6


 Unstar

103

 Fork

13

 Code

 Issues 29

 Pull requests 1

 Actions

 Projects

 Wiki

 Security

 Insights



ScanAPI

Automated Integration Testing and Live Documentation for your API

 World  @scanapi_

 Repositories 7  Packages  People 5  Projects 2

Pinned repositories

 scanapi

Automated Integration Testing and Live Documentation for your API

 Python  103  13

 examples

ScanAPI examples

 HTML  4

 design

Icons and logos

 4

 website

Website for ScanAPI testing framework.

 CSS  4



Follow

ScanAPI

@scanapi_

Automated Integration Testing and Live Documentation for your API

 github.com/scanapi/scanapi  Joined May 2020

6 Following 26 Followers

Tweets

Tweets & replies

Media

Likes

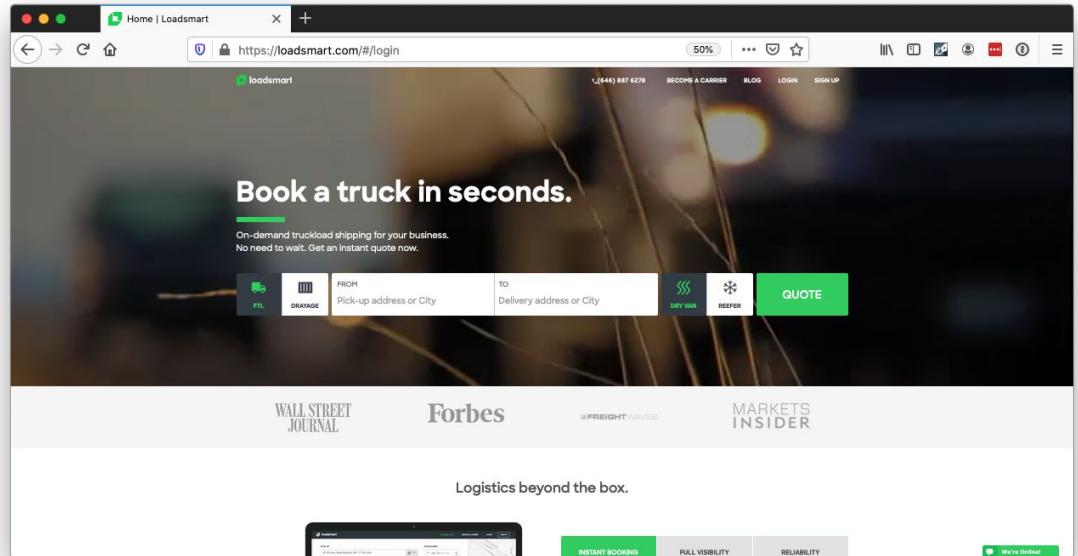


We are hiring!

Loadsmart



[Direct Link](#)





#talk-scanapi

#sprint-scanapi



THANK YOU



@cmaiacd



camilamaia