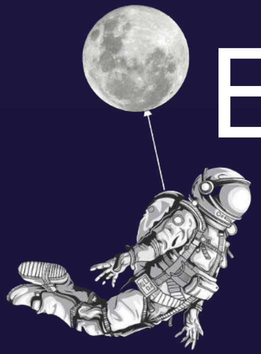
Best Practices for Building with External APIs



Ben Greenberg

Orbit® @rabbigreenberg

or alternatively...

Becoming an API Explorer

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Welcome to API Explorer Academy! 🚀

Our Mission

- **Discovering** what to look for
- **Equipping** with the right tools
- **Loving** the journey, *even* with the bumps along the way!

Before we start, who is this person talking to me?

- Professional API Wrangler (i.e. Developer Advocate) at Orbit
- Ruby is my happy language
- SAN 🛫 JFK 🛫 TLV

🌍 **orbit.love** 📧 **ben@orbit.love**

Bonus Slide!

We’re hiring 🙌

- Globally distributed team
- Remote first
- Empathetic product-driven engineering
- Enjoys space puns… *sometimes*

👉 orbit.love/careers

First of all...

What is an API?

“... when a company offers an API to their customers, it just means that they’ve built a set of dedicated URLs that return pure data responses — meaning the responses won’t contain the kind of presentational overhead that you would expect in a graphical user interface like a website.”

- *What is an API in Plain English*

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Examples of APIs

- Cat Facts - https://alexwohlbruck.github.io/cat-facts/
- Harvard Art Museums - https://github.com/harvardartmuseums/api-docs
- Google Books - https://developers.google.com/books/
- Charity Search - http://charityapi.orghunter.com/
- National Bank of Poland - http://api.nbp.pl/en.html
- U.S. Street Address Validation - https://www.smartystreets.com/docs/cloud/us-street-api
- Associated Press - https://developer.ap.org/

You’re interested in an API?

API Explorer Academy: Stage I

Initial Discovery

Your Investigation Checklist ✅

- 🚀 API Reference
- 🚀 Documentation
- 🚀 Credentialing
- 🚀 Rate Limits
- 🚀 Pagination
- 🚀 Support

API Reference

Why do you need an API reference?

> “The OpenAPI Specification (OAS) defines a standard, language-agnostic interface to RESTful APIs which allows both humans and computers to discover and understand the capabilities of the service without access to source code, documentation, or through network traffic inspection.”

- OpenAPI Introduction

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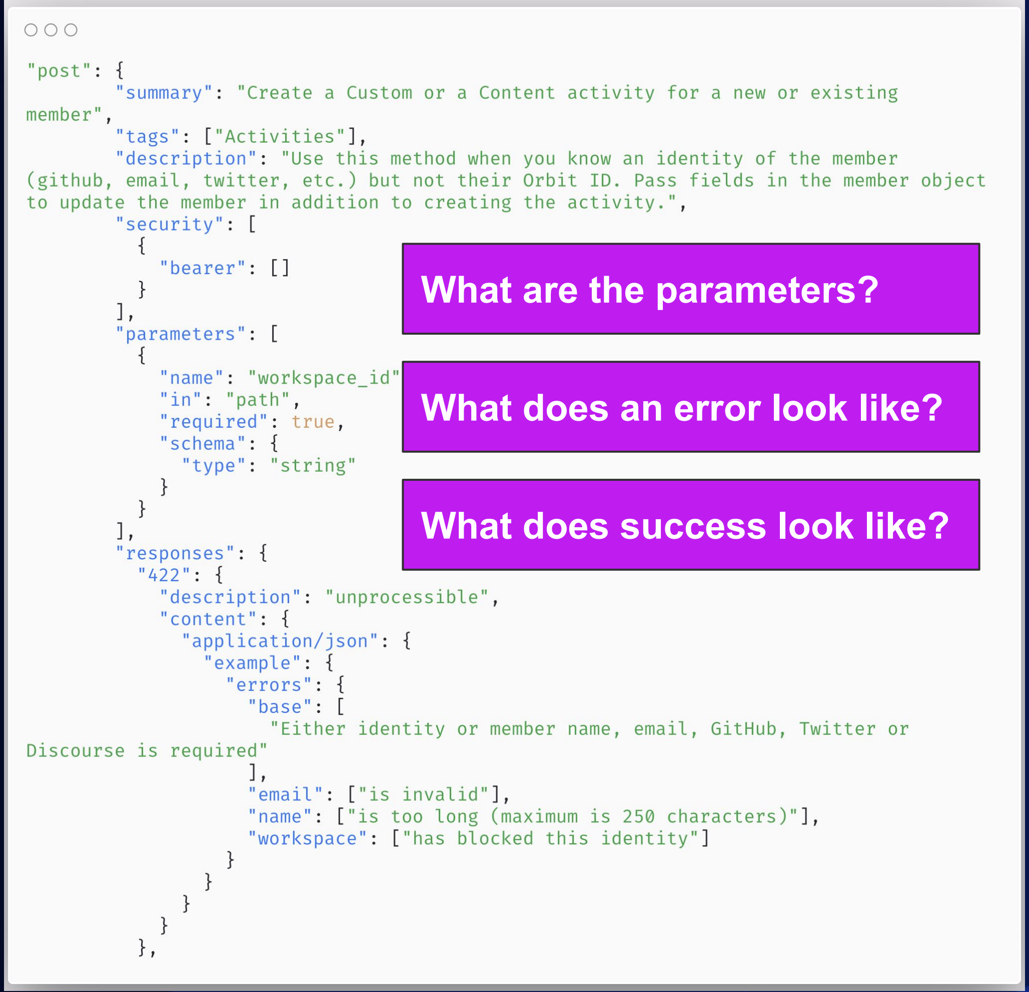
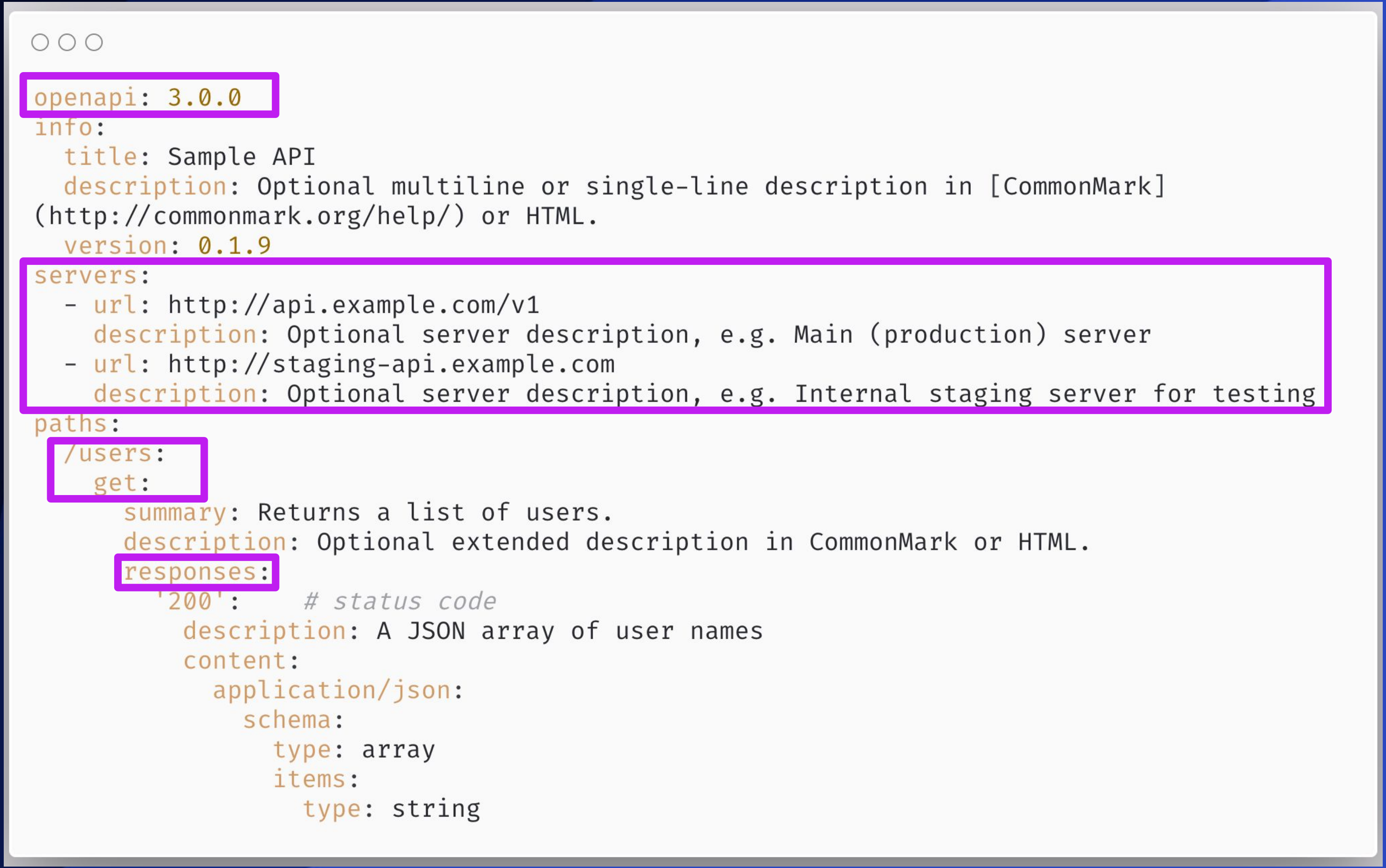


```
"post": {
        "summary": "Create a Custom or a Content activity for a new or existing
member",
        "tags": ["Activities"],
        "description": "Use this method when you know an identity of the member
(github, email, twitter, etc.) but not their Orbit ID. Pass fields in the member object
to update the member in addition to creating the activity.",
        "security": [
          {
            "bearer": []
          }
        ],
        "parameters": [
          {
            "name": "workspace_id"
            "in": "path",
            "required": true,
            "schema": {
              "type": "string"
            }
          }
        ],
        "responses": {
          "422": {
            "description": "unprocessible",
            "content": {
              "application/json": {
                "example": {
                  "errors": {
                    "base": [
                      "Either identity or member name, email, GitHub, Twitter or
Discourse is required"
                    ],
                    "email": ["is invalid"],
                    "name": ["is too long (maximum is 250 characters)"],
                    "workspace": ["has blocked this identity"]
                  }
                }
              }
            }
          },
```

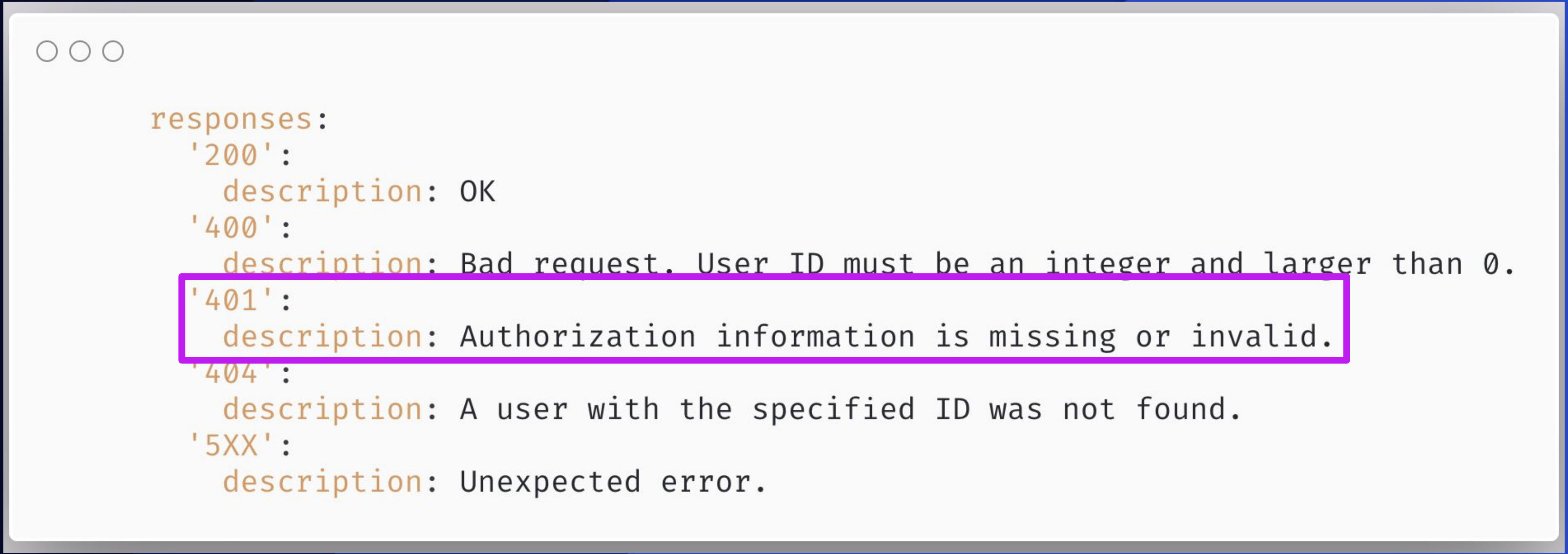
What are the parameters?

What does an error look like?

What does success look like?



```
openapi: 3.0.0
info:
  title: Sample API
  description: Optional multiline or single-line description in [CommonMark]
(http://commonmark.org/help/) or HTML.
  version: 0.1.9
servers:
  - url: http://api.example.com/v1
    description: Optional server description, e.g. Main (production) server
  - url: http://staging-api.example.com
    description: Optional server description, e.g. Internal staging server for testing
paths:
  /users:
    get:
      summary: Returns a list of users.
      description: Optional extended description in CommonMark or HTML.
      responses:
        '200':    # status code
          description: A JSON array of user names
          content:
            application/json:
              schema:
                type: array
                items:
                  type: string
```



```
responses:
  '200':
    description: OK
  '400':
    description: Bad request. User ID must be an integer and larger than 0.
  '401':
    description: Authorization information is missing or invalid.
  '404':
    description: A user with the specified ID was not found.
  '5XX':
    description: Unexpected error.
```

✅ Does it have an API reference?

Documentation

Is there documentation?

Can an API even be used without documentation... ?

- Stoplight

Types of Documentation

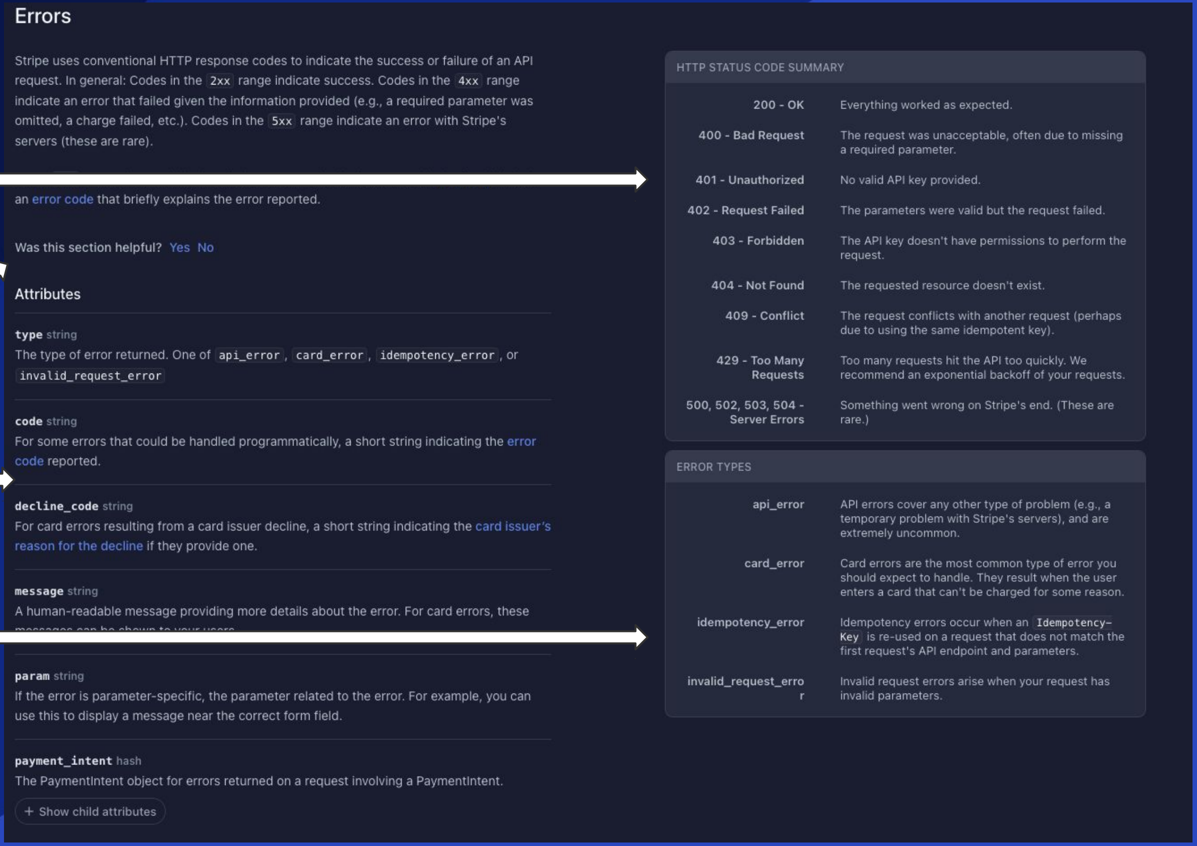
- 📚 Overviews
- 📚 Tutorials
- 📚 Quickstarts
- 📚 Code Snippets
- 📚 Use Cases

Describe each status code

Soliciting feedback

Attributes with data types

Describe error types



Errors

Stripe uses conventional HTTP response codes to indicate the success or failure of an API request. In general: Codes in the `2xx` range indicate success. Codes in the `4xx` range indicate an error that failed given the information provided (e.g., a required parameter was omitted, a charge failed, etc.). Codes in the `5xx` range indicate an error with Stripe's servers (these are rare).

an error code that briefly explains the error reported.

Was this section helpful? Yes No

Attributes

type string
The type of error returned. One of `api_error`, `card_error`, `idempotency_error`, or `invalid_request_error`

code string
For some errors that could be handled programmatically, a short string indicating the error code reported.

decline_code string
For card errors resulting from a card issuer decline, a short string indicating the card issuer's reason for the decline if they provide one.

message string
A human-readable message providing more details about the error. For card errors, these messages can be shown to your users.

param string
If the error is parameter-specific, the parameter related to the error. For example, you can use this to display a message near the correct form field.

payment_intent hash
The PaymentIntent object for errors returned on a request involving a PaymentIntent.

+ Show child attributes

HTTP STATUS CODE SUMMARY

200 - OK	Everything worked as expected.
400 - Bad Request	The request was unacceptable, often due to missing a required parameter.
401 - Unauthorized	No valid API key provided.
402 - Request Failed	The parameters were valid but the request failed.
403 - Forbidden	The API key doesn't have permissions to perform the request.
404 - Not Found	The requested resource doesn't exist.
409 - Conflict	The request conflicts with another request (perhaps due to using the same idempotent key).
429 - Too Many Requests	Too many requests hit the API too quickly. We recommend an exponential backoff of your requests.
500, 502, 503, 504 - Server Errors	Something went wrong on Stripe's end. (These are rare.)

ERROR TYPES

api_error	API errors cover any other type of problem (e.g., a temporary problem with Stripe's servers), and are extremely uncommon.
card_error	Card errors are the most common type of error you should expect to handle. They result when the user enters a card that can't be charged for some reason.
idempotency_error	Idempotency errors occur when an `Idempotency-Key` is re-used on a request that does not match the first request's API endpoint and parameters.
invalid_request_error	Invalid request errors arise when your request has invalid parameters.

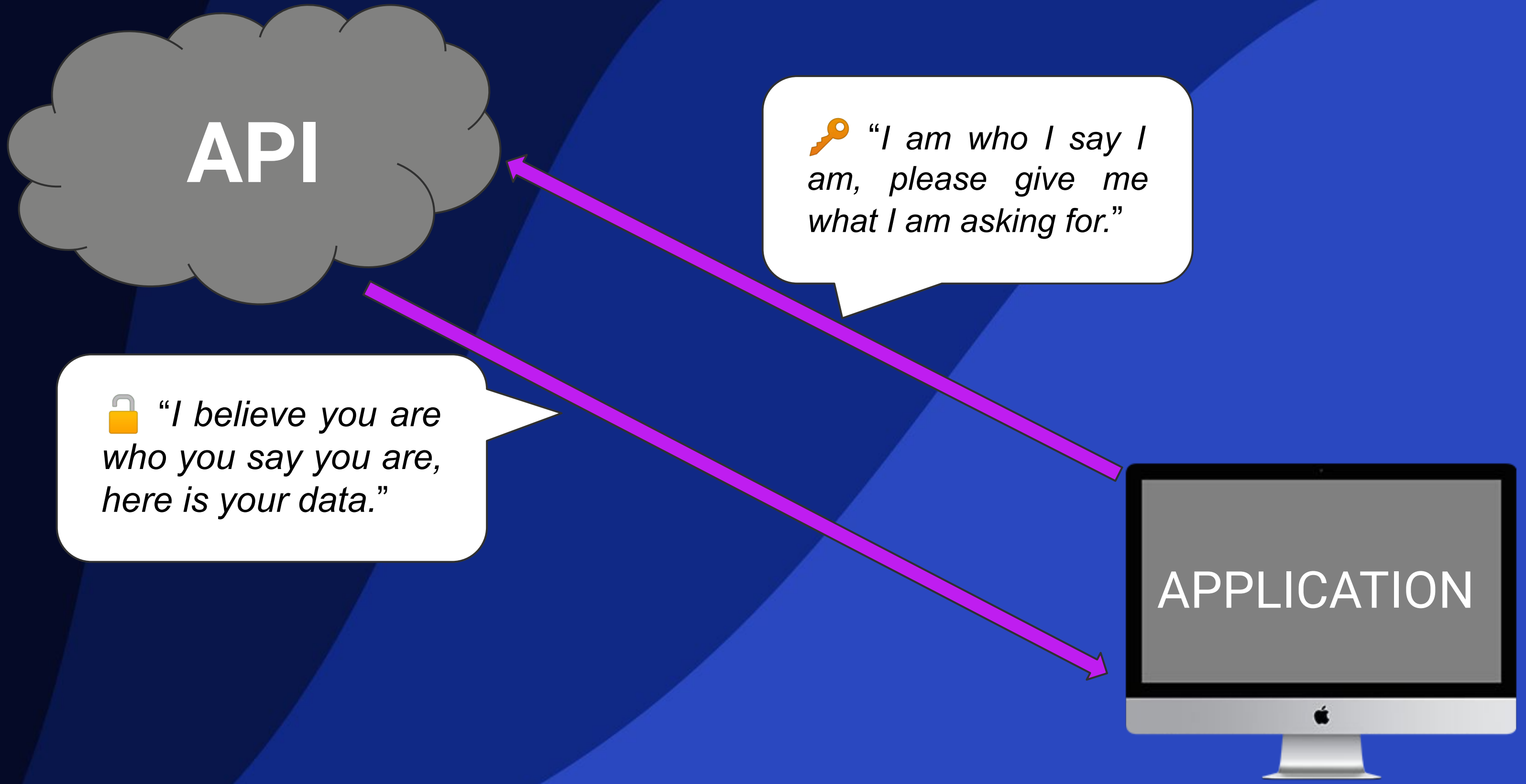
✅ Does it have documentation?

Credentials

Is it secure?

Authentication is Identity

Authorization is Access



API

🔑 *“I am who I say I am, please give me what I am asking for.”*

🔓 *“I believe you are who you say you are, here is your data.”*

APPLICATION

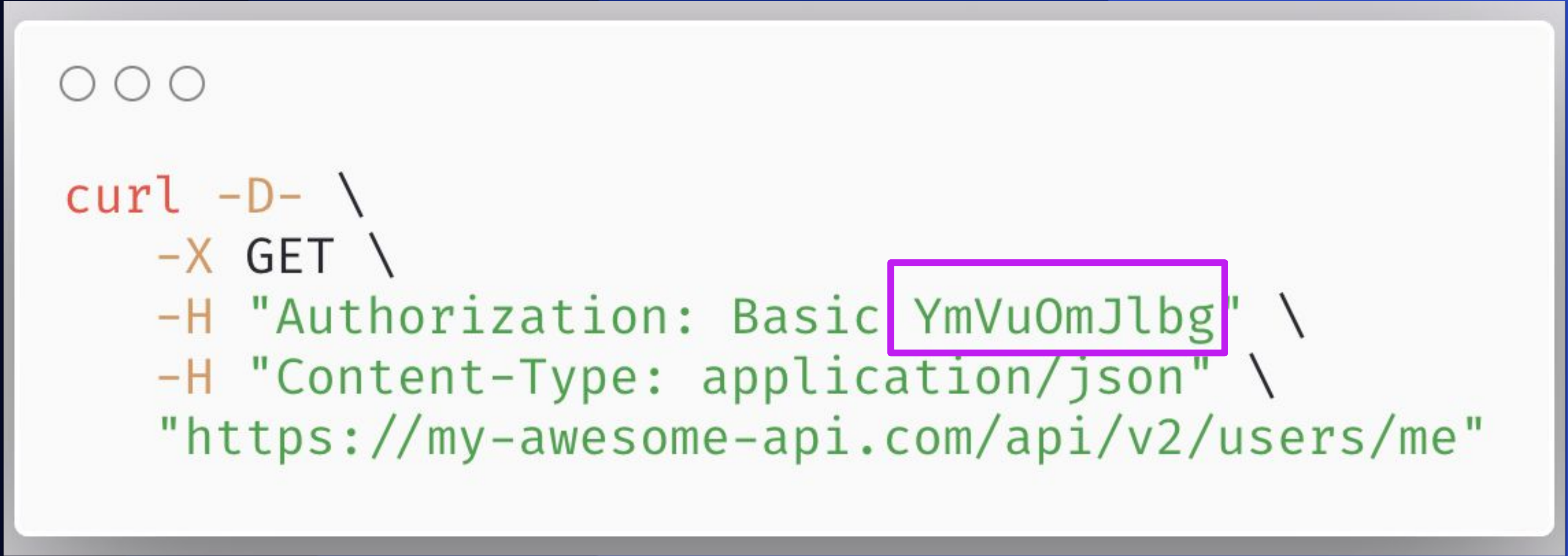
Authentication Protocols

- 🔐 Basic Auth
- 🔐 API Key
- 🔐 OAuth

Authentication Protocols

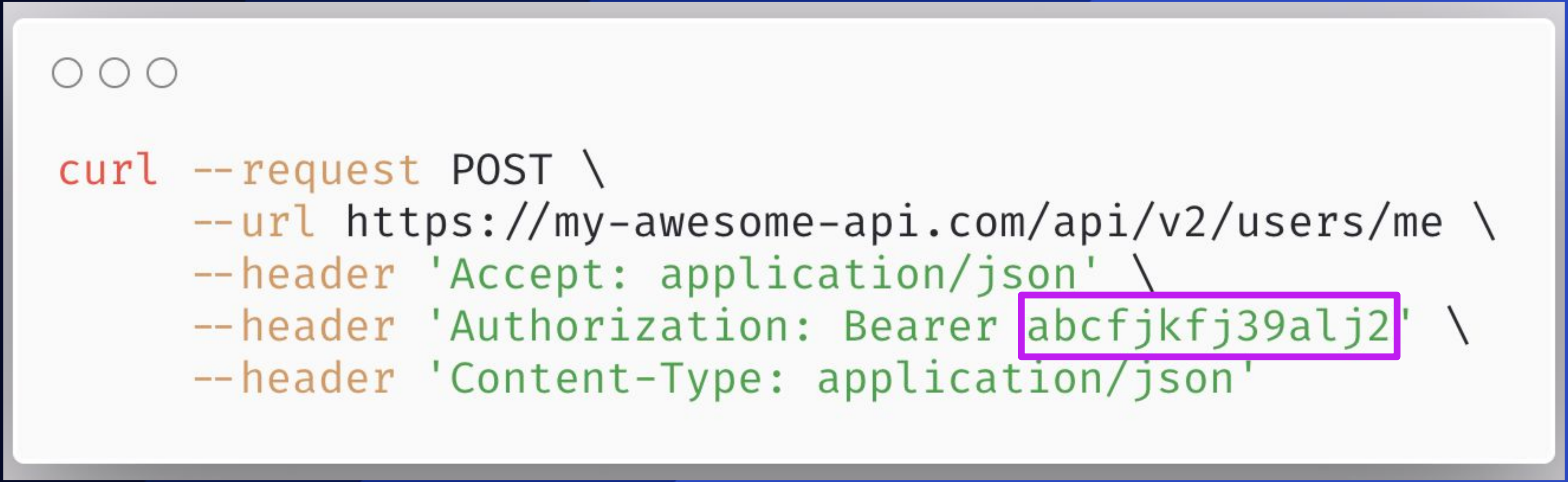
- 🔐 Basic Auth
  - Base64 encoded username and password
- 🔐 API Key
  - A key that identifies an authorized application
- 🔐 OAuth
  - User scoped authentication
  - Multi-step process

Basic Authentication Example



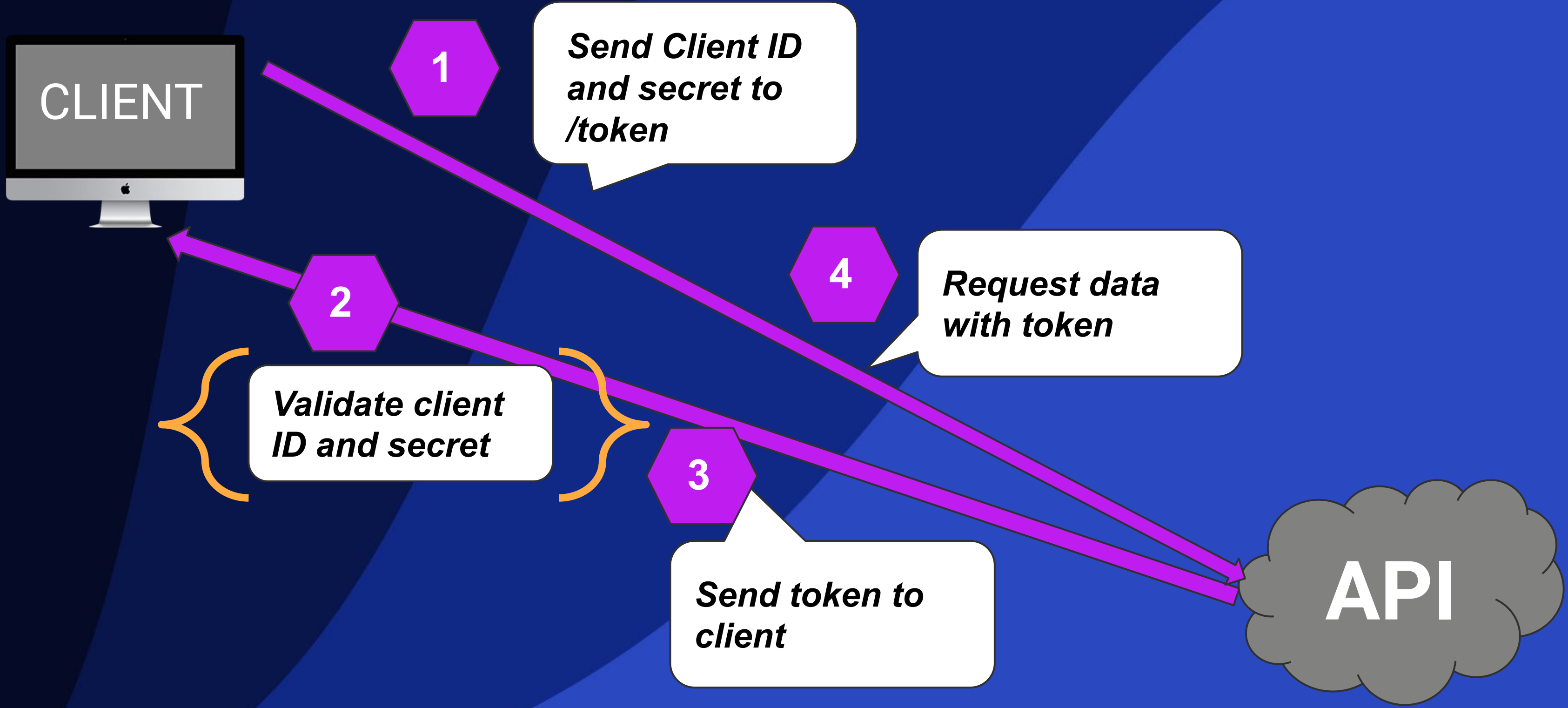
```
curl -D- \
   -X GET \
   -H "Authorization: Basic YmVuOmJlbg" \
   -H "Content-Type: application/json" \
   "https://my-awesome-api.com/api/v2/users/me"
```

API Key Example



```
curl --request POST \
     --url https://my-awesome-api.com/api/v2/users/me \
     --header 'Accept: application/json' \
     --header 'Authorization: Bearer abcfjkfj39alj2' \
     --header 'Content-Type: application/json'
```

OAuth 2.0 Client Credentials Flow



1 Send Client ID and secret to /token

2 Validate client ID and secret

3 Send token to client

4 Request data with token

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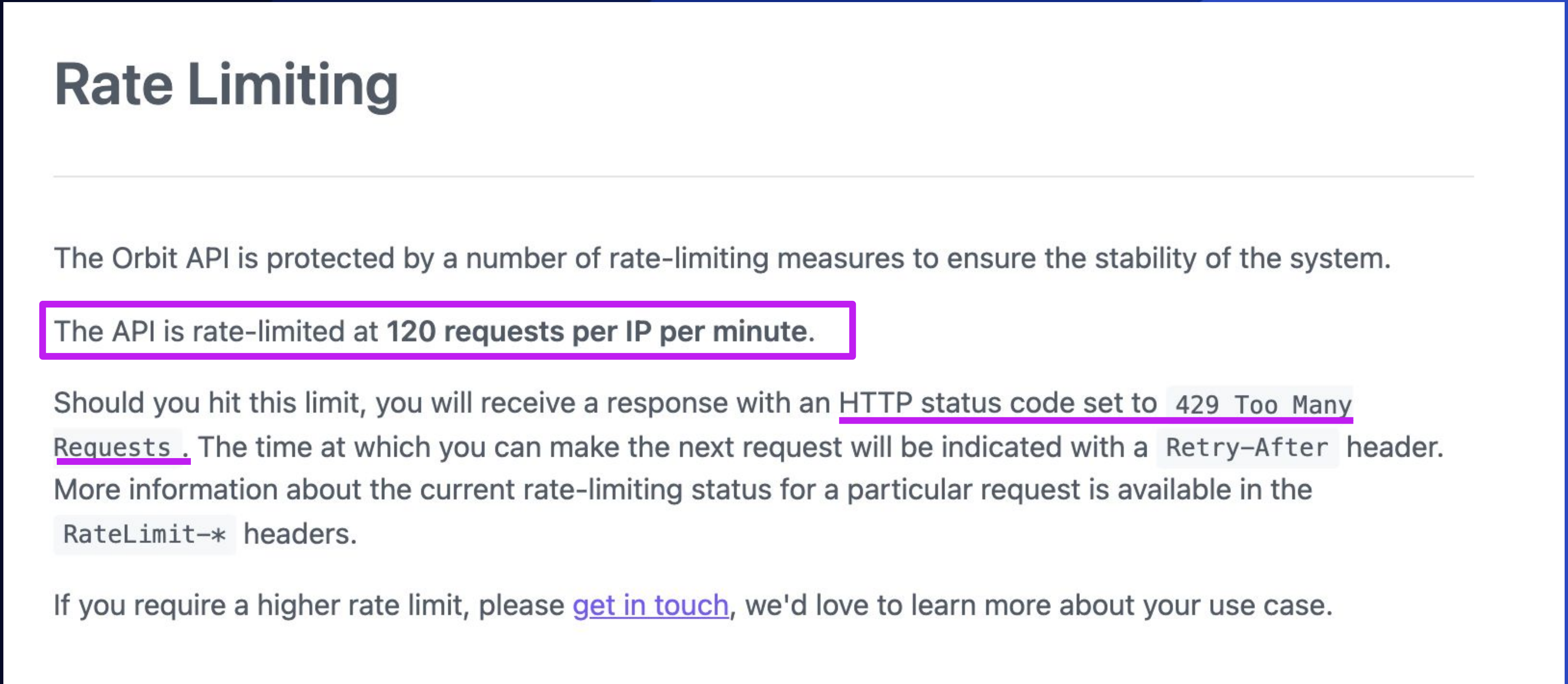
☑️ How does it authenticate?

Rate Limiting and Pagination

Are there limits?

Rate Limiting is about requests

Pagination is about records



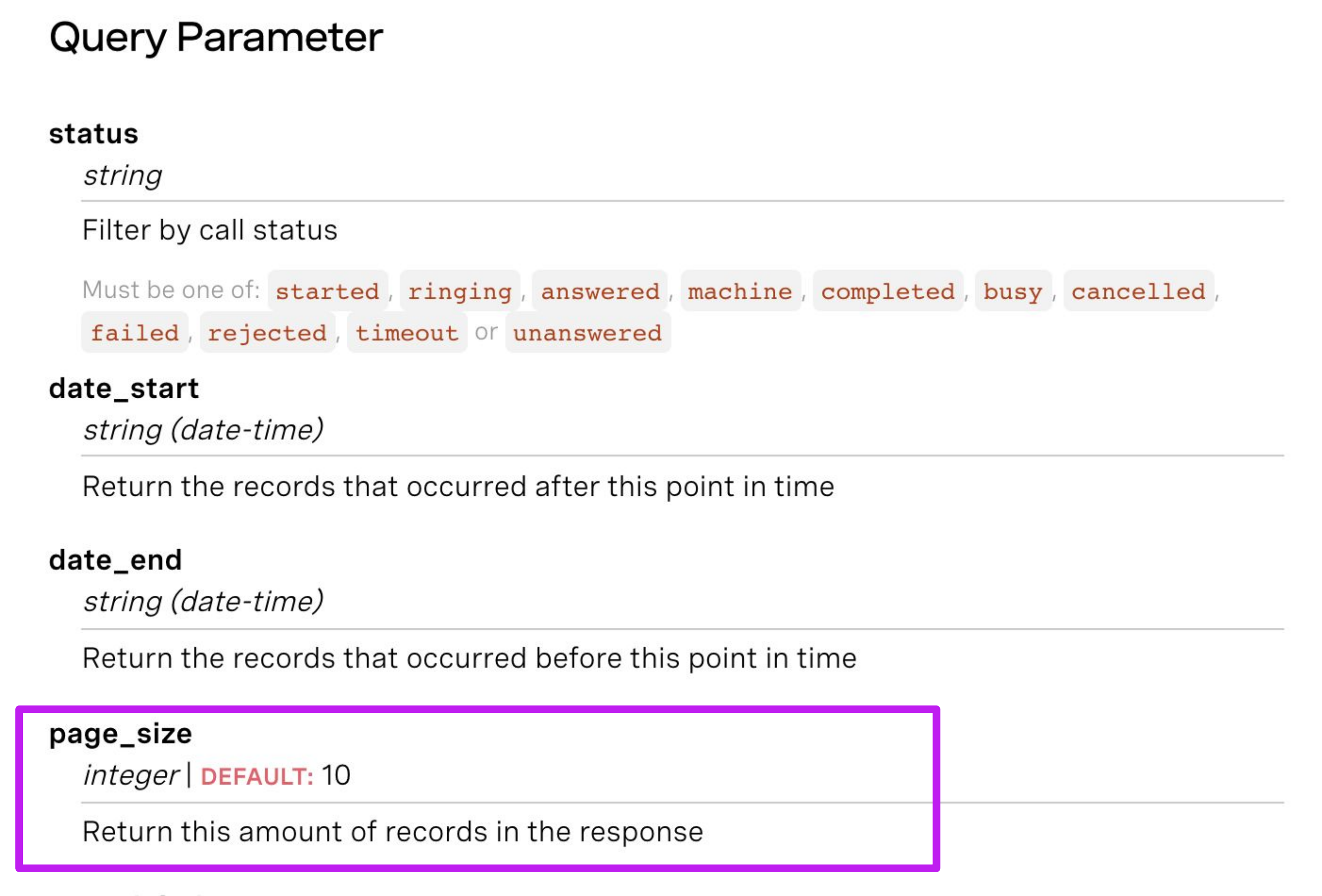
Rate Limiting

The Orbit API is protected by a number of rate-limiting measures to ensure the stability of the system.

The API is rate-limited at **120 requests per IP per minute.**

Should you hit this limit, you will receive a response with an HTTP status code set to `429 Too Many Requests`. The time at which you can make the next request will be indicated with a `Retry-After` header. More information about the current rate-limiting status for a particular request is available in the `RateLimit-*` headers.

If you require a higher rate limit, please get in touch, we'd love to learn more about your use case.



Query Parameter

status

string

Filter by call status

Must be one of: `started`, `ringing`, `answered`, `machine`, `completed`, `busy`, `cancelled`, `failed`, `rejected`, `timeout` or `unanswered`

date_start

string (date-time)

Return the records that occurred after this point in time

date_end

string (date-time)

Return the records that occurred before this point in time

page_size

integer | **DEFAULT:** 10

Return this amount of records in the response

API Explorer Academy:Stage II

Pre-Flight Checks

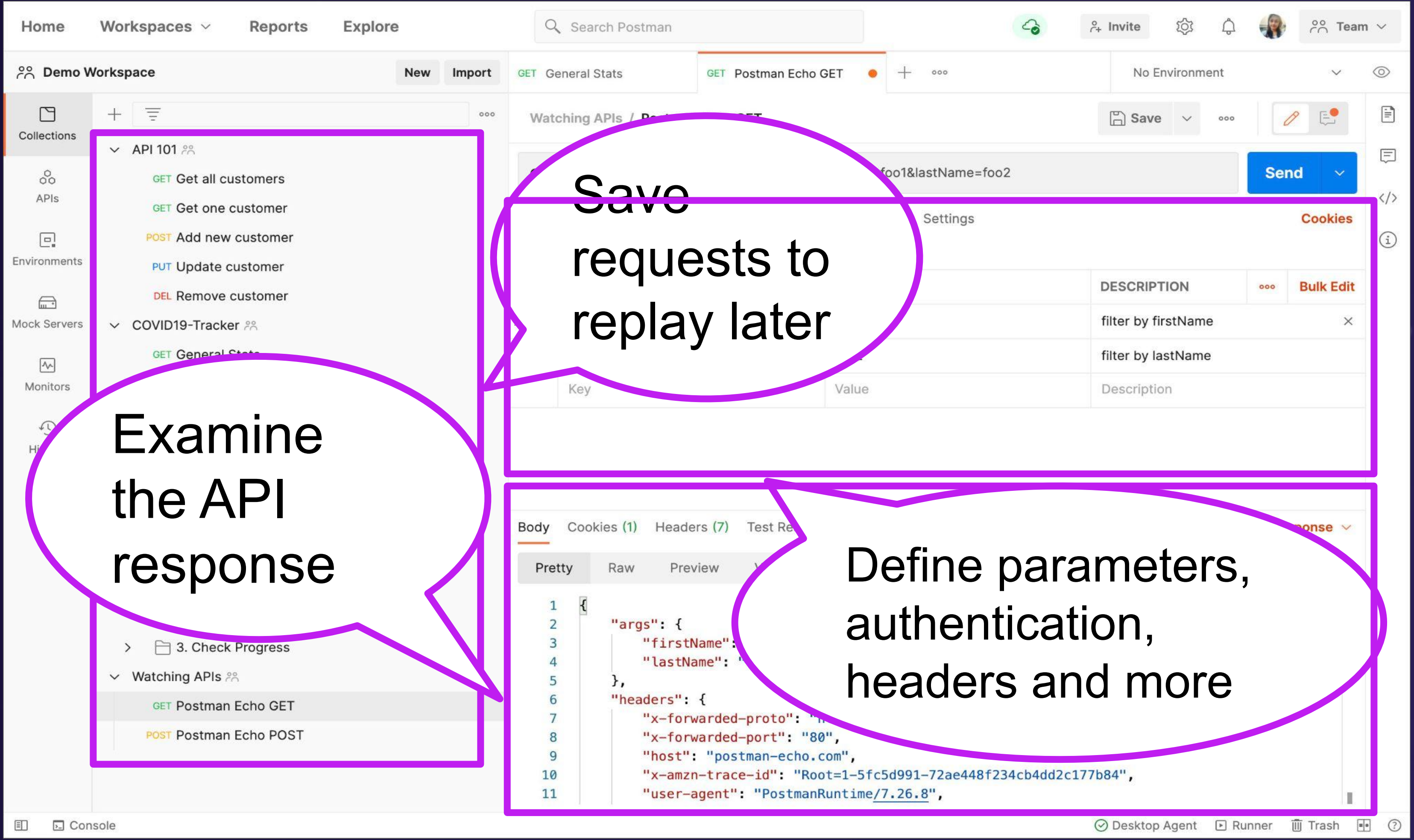
Let's check out this API!

Experimenting with an API

Why do we experiment?

- ✅ See Live Data
- ✅ Check Assumptions
- ✅ Do Something Wrong

POSTMAN



```
{
    "args": {
        "firstName":
        "lastName": "
    },
    "headers": {
        "x-forwarded-proto": "
        "x-forwarded-port": "80",
        "host": "postman-echo.com",
        "x-amzn-trace-id": "Root=1-5fc5d991-72ae448f234cb4dd2c177b84",
        "user-agent": "PostmanRuntime/7.26.8",
```

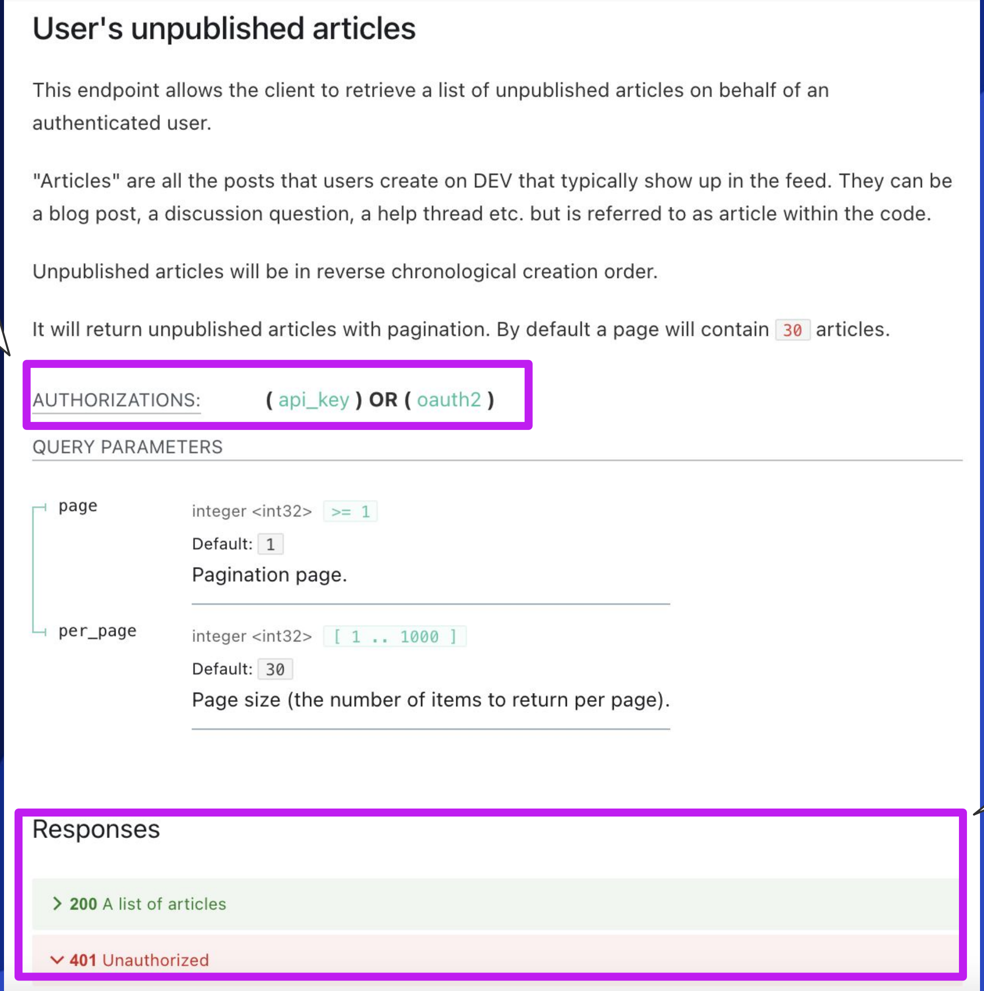
Save requests to replay later

Examine the API response

Define parameters, authentication, headers and more

Authorization options:

- API Key
- OAuth



User's unpublished articles

This endpoint allows the client to retrieve a list of unpublished articles on behalf of an authenticated user.

"Articles" are all the posts that users create on DEV that typically show up in the feed. They can be a blog post, a discussion question, a help thread etc. but is referred to as article within the code.

Unpublished articles will be in reverse chronological creation order.

It will return unpublished articles with pagination. By default a page will contain `30` articles.

AUTHORIZATIONS: (api_key) **OR** (oauth2)

QUERY PARAMETERS

page	integer <int32> `>= 1` Default: `1` Pagination page.
per_page	integer <int32> `[ 1 .. 1000 ]` Default: `30` Page size (the number of items to return per page).

Responses

> **200** A list of articles

⌄ **401** Unauthorized

Possible API responses:

- 200
- 401

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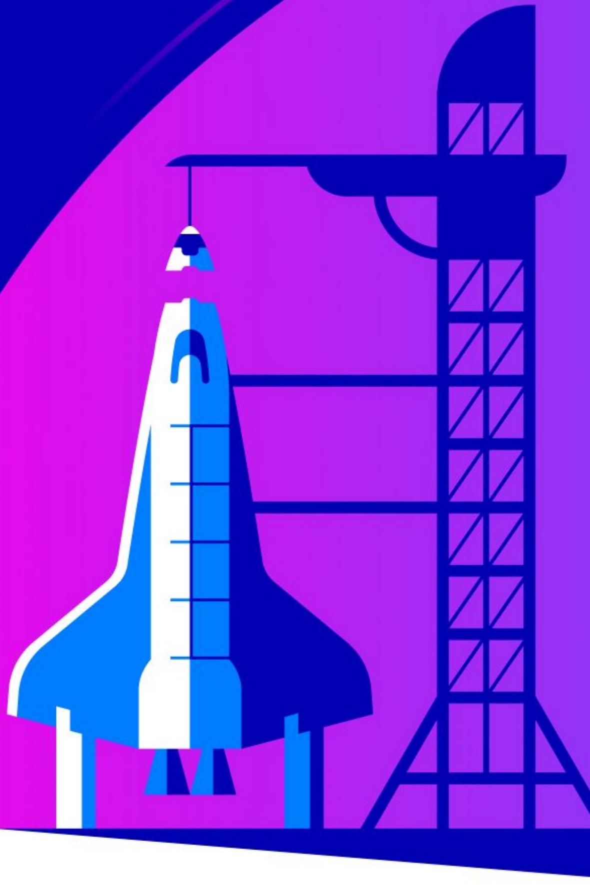
API Explorer Academy: Stage III

Ready to Launch

You don't have to do it alone



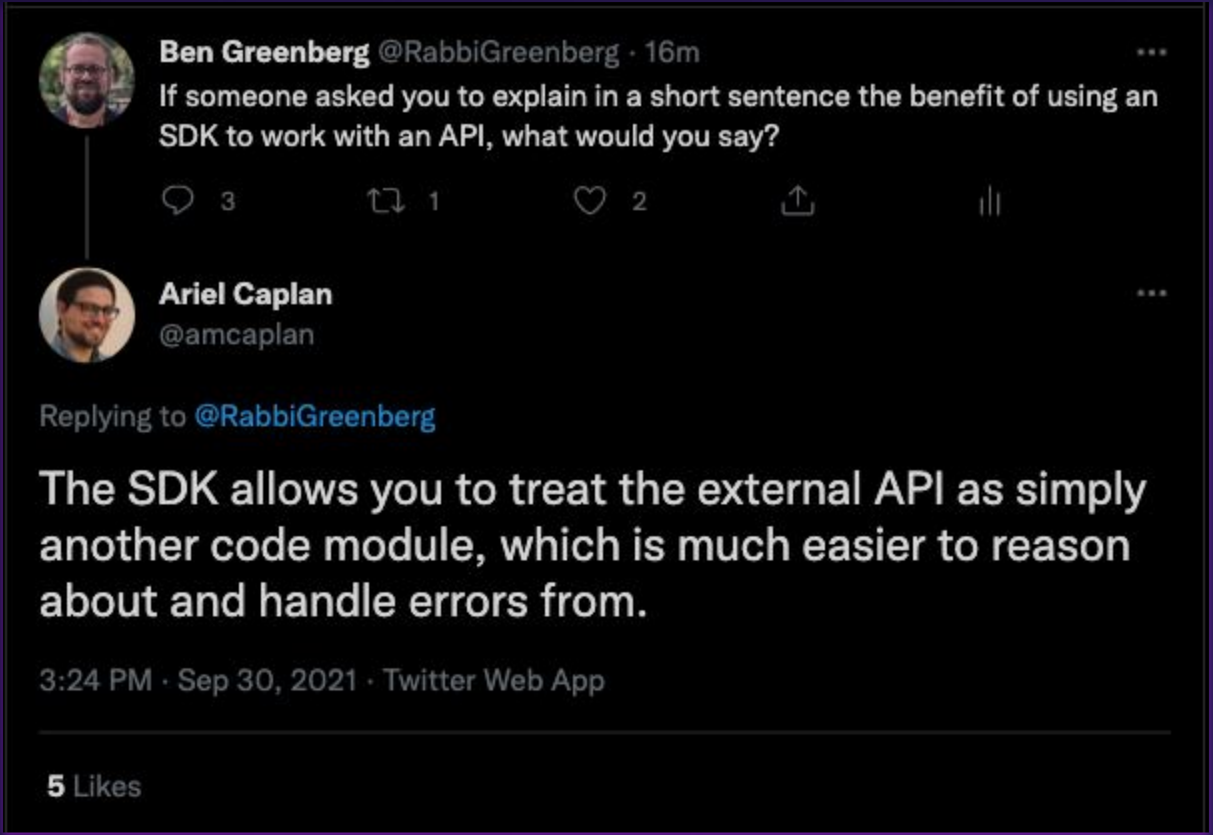
Tools To Help You On Launch Day

- ✅ SDKs
- ✅ Low-Code/No-Code Tools

What is an SDK?

> “SDK stands for software development kit. Also known as a devkit, the SDK is a set of software-building tools for a specific platform, including the building blocks, debuggers and, often, a framework or group of code libraries such as a set of routines specific to an operating system (OS).”

- *IBM Introduction to SDKs*



Ben Greenberg @RabbiGreenberg · 16m

If someone asked you to explain in a short sentence the benefit of using an SDK to work with an API, what would you say?

Ariel Caplan
@amcaplan

Replying to @RabbiGreenberg

The SDK allows you to treat the external API as simply another code module, which is much easier to reason about and handle errors from.

3:24 PM · Sep 30, 2021 · Twitter Web App

5 Likes

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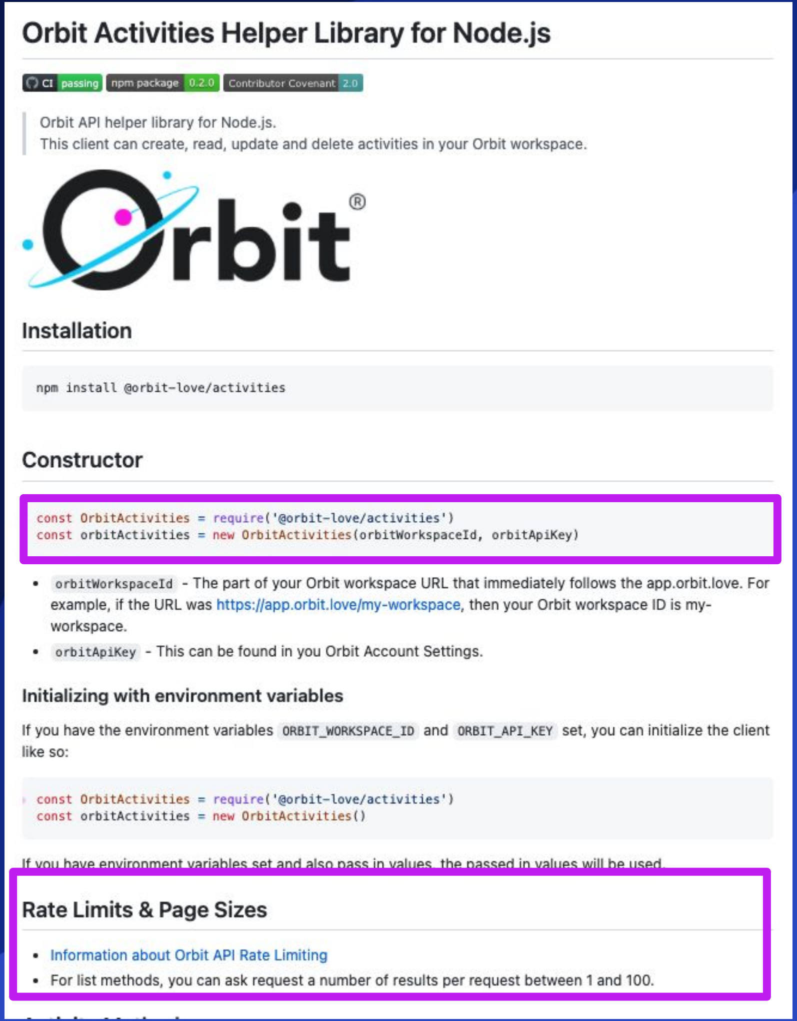
Stop worrying about the API

Manages authentication



Orbit Activities Helper Library for Node.js

CI passing | npm package 0.2.0 | Contributor Covenant 2.0

> Orbit API helper library for Node.js.
> This client can create, read, update and delete activities in your Orbit workspace.

Installation

```
npm install @orbit-love/activities
```

Constructor

```
const OrbitActivities = require('@orbit-love/activities')
const orbitActivities = new OrbitActivities(orbitWorkspaceId, orbitApiKey)
```

- `orbitWorkspaceId` - The part of your Orbit workspace URL that immediately follows the app.orbit.love. For example, if the URL was https://app.orbit.love/my-workspace, then your Orbit workspace ID is my-workspace.
- `orbitApiKey` - This can be found in you Orbit Account Settings.

Initializing with environment variables

If you have the environment variables `ORBIT_WORKSPACE_ID` and `ORBIT_API_KEY` set, you can initialize the client like so:

```
const OrbitActivities = require('@orbit-love/activities')
const orbitActivities = new OrbitActivities()
```

If you have environment variables set and also pass in values, the passed in values will be used.

Rate Limits & Page Sizes

- Information about Orbit API Rate Limiting
- For list methods, you can ask request a number of results per request between 1 and 100.

Handles rate limiting and pagination

APIs Can Introduce Breaking Changes

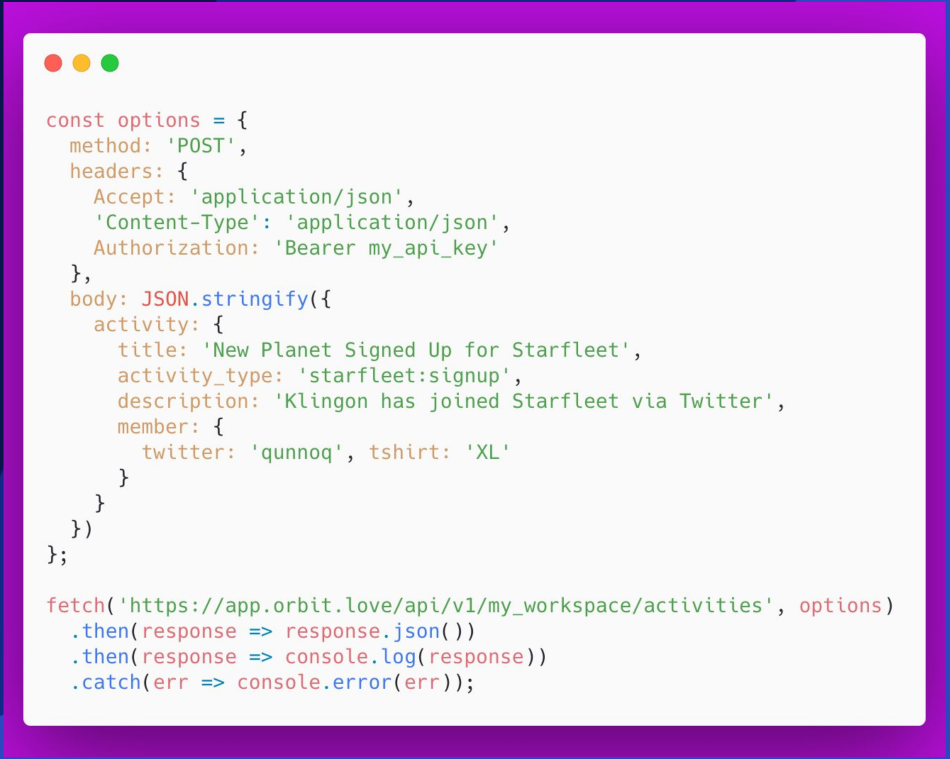
Don’t Let Them Break You

Adding Activities to Orbit

via the API directly

You need to know:

- Headers
- Authentication
- Data format (JSON)
- Data types



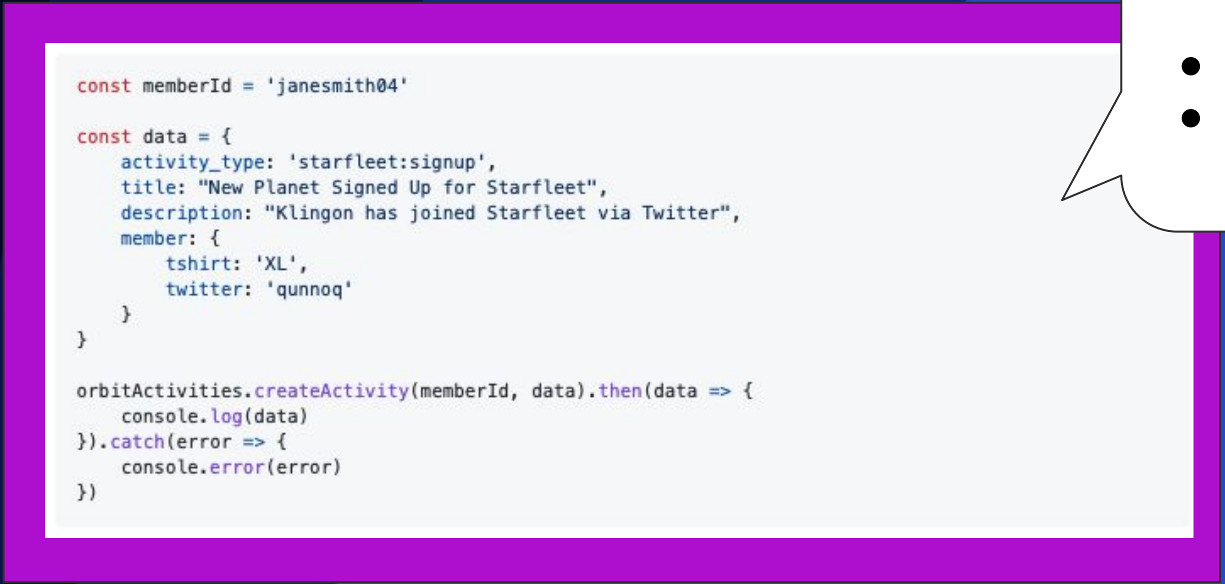
```
const options = {
  method: 'POST',
  headers: {
    Accept: 'application/json',
    'Content-Type': 'application/json',
    Authorization: 'Bearer my_api_key'
  },
  body: JSON.stringify({
    activity: {
      title: 'New Planet Signed Up for Starfleet',
      activity_type: 'starfleet:signup',
      description: 'Klingon has joined Starfleet via Twitter',
      member: {
        twitter: 'qunnoq', tshirt: 'XL'
      }
    }
  })
};

fetch('https://app.orbit.love/api/v1/my_workspace/activities', options)
  .then(response => response.json())
  .then(response => console.log(response))
  .catch(err => console.error(err));
```

All these are subject to change (often)!

Adding Activities to Orbit

via the SDK



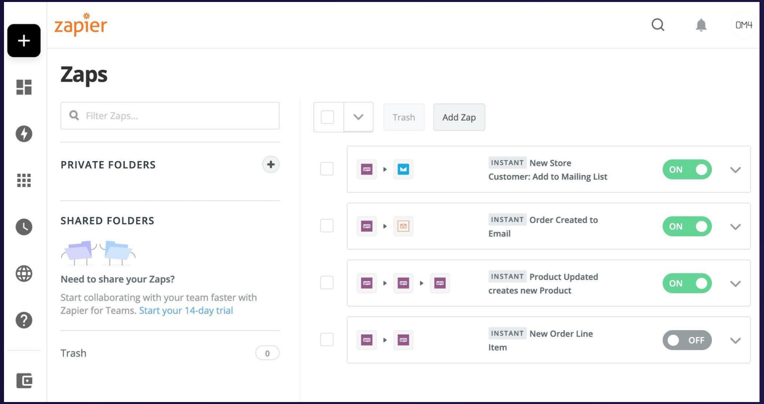
```
const memberId = 'janesmith04'

const data = {
    activity_type: 'starfleet:signup',
    title: "New Planet Signed Up for Starfleet",
    description: "Klingon has joined Starfleet via Twitter",
    member: {
        tshirt: 'XL',
        twitter: 'qunnoq'
    }
}

orbitActivities.createActivity(memberId, data).then(data => {
    console.log(data)
}).catch(error => {
    console.error(error)
})
```

You need to know:

- What your data is
- What method to call



zapier

Zaps

Filter Zaps...

PRIVATE FOLDERS

SHARED FOLDERS

Need to share your Zaps?

Start collaborating with your team faster with Zapier for Teams. Start your 14-day trial

Trash 0

Trash | Add Zap

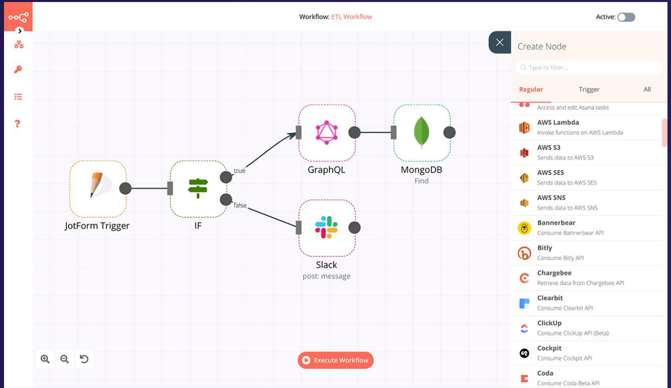
□	INSTANT New Store Customer: Add to Mailing List	ON
□	INSTANT Order Created to Email	ON
□	INSTANT Product Updated creates new Product	ON
□	INSTANT New Order Line Item	OFF

zapier

- Build workflows graphically
- Integrate with numerous services automatically
- Customer support

n8n.io

- Build workflows graphically
- Add custom code solutions
- More programmer-oriented



Workflow: ETL Workflow

Active:

Create Node

Type to filter...

Regular | Trigger | All

Access and edit Asana tasks

AWS Lambda
Invoke functions on AWS Lambda

AWS S3
Sends data to AWS S3

AWS SES
Sends data to AWS SES

AWS SNS
Sends data to AWS SNS

Bannerbear
Consume Bannerbear API

Bitly
Consume Bitly API

Chargebee
Retrieve data from Chargebee API

Clearbit
Consume Clearbit API

ClickUp
Consume ClickUp API (Beta)

Cockpit
Consume Cockpit API

Coda
Consume Coda Beta API

API Explorer Academy: Stage IV

Creating Outposts

Celebrate your wins along the way

Each new learning is another new outpost in your growth

“Instead of specializing in speedometers or steering wheels, software supply chain companies deliver reusable chunks of code that developers bring together to make finished applications...

Orbit @rabbigreenberg

These are called APIs...

... This shift to component software is the next big leap in the evolution of the software industry.” - Jeff Lawson

Stay in Touch

✉ ben@orbit.love

@rabbigreenberg

@bencgreenberg

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