Introduction to Open API Specification

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Describing APIs

- Describe RESTful HTTP APIs in a machine-readable way
- API description is independent of outputs such as documentation
- Enable things that are not "just" documentation



Spec-First API Design





About OpenAPI Spec

API description language formerly known as "Swagger".

Became "OpenAPI Spec" -> v3 released

(some tools are still catching up on v3)



New APIs or Existing Ones?

New APIs or Existing Ones?

Yes!





Anatomy of OpenAPI Spec





Anatomy of OpenAPI Spec

Top-level elements:

- openapi
- info
- servers
- paths
- components
- security
- tags



OpenAPI Spec Examples

A JSON or YAML file holds the description (this is YAML)

```
openapi: 3.0.0
servers:
    - url: 'https://api.nexmo.com/ni'
info:
    title: Number Insight API
    version: 1.1.0
    description: >-
        Nexmo's Number Insight API delivers real-time intelligence about the value
```

... a few hundred more lines here



Documenting an Endpoint

paths:

'/basic/{format}':

parameters:

- \$ref: '#/components/parameters/format'

get:

operationId: getNumberInsightBasic

parameters:

- \$ref: '#/components/parameters/number'
- \$ref: '#/components/parameters/country'

responses:

```
'200':
description: OK
content:
   application/json:
      schema:
      $ref: '#/components/schemas/niResponseJsonBasic'
```



Example Parameter

number:

```
name: number
in: query
description: 'A single phone number that you need insight about in national or
example: '447700900000'
required: true
schema:
  type: string
  pattern: '^[0-9-+\(\)\s]*$'
```

Example Response

niResponseJsonBasic: type: object properties: status: \$ref: '#/components/schemas/niBasicStatus' status message: type: string description: 'The status description of your request.' example: 'Success' request_id: type: string description: 'The unique identifier for your request. This is a alphanumer: example: 'aaaaaaaa-bbbb-cccc-dddd-0123456789ab' maxLength: 40

• • •

That looks complicated!





Rendered Example: ReDoc

| 🗅 ReDoc X + | 808 |
|--|---|
| $\leftarrow \rightarrow \mathbf{C}$ (i) localhost:5000 | Q 🕁 💋 💐 🙆 🔞 📓 🚱 🛛 🍪 📓 |
| Q Search | |
| Authentication | Number Insight API (1.0.0) |
| Basic Number Insight | Download OpenAPI specification: Download |
| GET Standard Number Insight | Nexmo DevRel: devrel@nexmo.com URL: https://developer.nexmo.com/ License: The MIT License (MIT) Terms of Service |
| GET Advanced Number Insight (sync) | Nexmo's Number Insight API delivers real-time intelligence about the validity, reachability and roaming status of a phone number and tells you how to format the number correctly in your application. There are three levels of Number Insight API available: Basic, Standard and Advanced. The advanced API is available asynchronously as well as synchronously. |
| GET Advanced Number Insight (async) | https://developer.nexmo.com/api/number-insight |
| Documentation Powered by ReDoc | |
| | Authentication |

apiKey

Rendered Example: Nexmo

| O Nexmo Developer x + | _ | | | _ | 00 |
|--|---|---|---|---|--|
| ← → C https://developer.nexmo. | com/api/number-insight | | | | ☆ 🕐 🛡 💐 🔍 🌚 🕍 🚳 🦓 🗄 |
| Documentation Tutorials API F | Reference SDKs & | Tools Community Extend | | | Q Search |
| NUMBER INSIGHT API Overview Sasic Number Insight GET Standard Number GET Insight Advanced Number GET Insight (sync) | Nexmo's Numbe number and tells available: Basic, \$ | er Insight API delivers real-time intelligence about the validity, you how to format the number correctly in your application. T Standard and Advanced. The advanced API is available asynchiopenAPI 3 Definition | reachability and roaming s There are three levels of Nu ronously as well as synchro | tatus of a phone Imber Insight API Inously. | JSON ~ |
| Advanced Number Insight (async) Asynchronous response | Basic Num GET https: Path Param | nber Insight //api.nexmo.com/ni/basic/:format eters | | | <pre>HTTP response 200 ^ { "status": 0, "status_message": "Success", "request_id": "aaaaaaaa-bbbb-cccc-dddd-01234567 </pre> |
| | Key format REQUIRED string | Description The format of the response Must be one of: j son or xml | Example | Default | <pre>"national_format_number": "447,00500000", "national_format_number": "07700 900000", "country_code: "GB", "country_code_iso3": "GBR", "country_name": "United Kingdom", "country_prefix": "44" }</pre> |
| | Query Para | meter | | | |
| | Кеу | Description | Example | Default | |
| | api_key apiKey | You can find your API key in your account overview | abc123 | None | |



Imported into Postman

| File Edit View Help | Postman | | |
|-------------------------------------|---------------------------------|---|--|
| H New Import Runner | My Workspace 🔻 | 🎝 Invite 📀 | 📽 ዾ 🌢 💎 🧭 Upgrade 🔻 |
| Q Filter | GET Basic Number Insight X + •• | 1 | No Environment 🔹 📀 🌞 |
| History Collections | Basic Number Insight | | Examples (1) 🔻 |
| Trash C | GET • {{baseUrl}}/basic/:format | api_key=&number= <string>&country=<s?< td=""><td>string> Send - Save -</td></s?<></string> | string> Send - Save - |
| Vumber Insight API 🔶 4 requests | Params Authorization Headers | Body Pre-request Script Tests | Cookies Code Comments (0) |
| ▼ ■ advanced •••• | KEY | VALUE | DESCRIPTION ••• Bulk Edit |
| GET Advanced Number Insight (sync) | format | <string></string> | The format of the response |
| GET Advanced Number Insight (async) | KEY | VALUE | DESCRIPTION ••• Bulk Edit |
| GET Basic Number Insight | api_key | | You can find your API key in your [accou |
| GET Standard Number Insight | number | <string></string> | A single phone number that you need in |
| Fun with HTTP | country | <string></string> | If a number does not have a country co |
| 1 request | Кеу | Value | Description |
| | | 🔉 Learn | Build Browse |

Tools To Get Things Done





Please use Source Control



See also: https://gitworkbook.com

Editing Tools

There are editors with helpful tools

- I like Atom with linter-swagger https://atom.io
- Try SwaggerUI, SwaggerHub, etc https://swagger.io/tools/
- APICurio Studio gets good reviews https://www.apicur.io/
- Stoplight looks interesting https://stoplight.io

(feel free to tweet your best tools at me, I'll share them all later)



OAS in Atom

| | number-insight.yml — ~/projects/nexmo-api-specification/definitions — Atom | |
|--------------------------------------|---|----------------------------|
| File Edit View Selection Find Packag | jes Help | |
| Project | numberinsight.yml | |
| 🗸 🛅 definitions | | |
| > 💼 account | 2 openapi: 3.0.0 | |
| audit.yml | 3 servers: | |
| i dispatch.yml | 4 - url: ' <u>https://api.nexmo.com/ni</u> ' | |
| | 5 info: | |
| | 6 title: Number Insight API | |
| messages-olympus.yml | 7 version: 1.0.0 | |
| messages.ymt number-insight.yml | 8 description: >- | |
| edact.yml | 9 Nexmo's Number Insight API delivers real-time intelligence about the validity, reachability and roami | ing status of a |
| | 10 contact. | ing status of t |
| E stitch.yml | 11 name: Nexmo DevRel | |
| verify.yml vaice.yml | 12 maile. Nexilo Device | |
| | 12 email: devietem.com | |
| | 15 Urt: <u>nttps://devetoper.nexmo.com/</u> | |
| | 14 termsutservice: <u>https://www.nexmo.com/terms-oi-use</u> | |
| | 15 License: | |
| | 16 name: 'The MIT License (MIT)' | |
| | 17 url: ' <u>https://opensource.org/licenses/MIT</u> ' | |
| | 18 externalDocs: | |
| | <pre>19 url: https://developer.nexmo.com/api/number-insight</pre> | |
| | 20 x-sha1: 081f6d985e2e4a75586da1654fde880a96885405 | |
| | 21 security: | |
| | 22 - apiKey: [] | |
| | 23 apiSecret: [] | |
| | 24 paths: | |
| | 25 '/basic/{format}': | |
| | 26 parameters: | |
| | 27 - <pre>\$ref: '#/components/parameters/format'</pre> | |
| | 28 get | |
| | 20 gett | |
| | 20 summary: Basic Number Insight | |
| | | |
| number-insight.yml 🕐 0 🛦 0 🚯 0 1:1 | ● LF UTF-8 YAML ∲ master ♂ Fetch | 🗈 4815 files 🛛 📅 2 updates |

Validation Tools

Tools that check or "lint" your file.

- Speccy is a CLI tool with configurable rules http://speccy.io/
- Open API Spec Validator https://github.com/p1c2u/openapi-spec-validator

Set up in your editor or use a watch command, e.g.: watch -n 1 speccy lint myspec.yml



Preview Tools

OAS is a standard! So any preview should do:

- ReDoc is great https://github.com/Rebilly/ReDoc
- Speccy also wraps ReDoc for its serve command
- You can run OpenApi-GUI locally https://github.com/mermade/openapi-gui

Creating OpenAPI Specs is like eating an elephant





Uses for OpenAPI Spec

Resources

- https://www.openapis.org
- https://apievangelist.com
- https://speccy.io
- https://github.com/Rebilly/ReDoc
- https://openapi.tools
- https://github.com/openapitools/openapi-generator



Bonus Extra Slides

Code Generators

Libraries can be generated as easily as docs.

For PHP (and so many other languages) try https://github.com/openapitools/openapi-generator

Pull docker image, generate PHP code from your OpenAPI Spec

Code Generator Example

```
1 $config->setUsername(NEXMO API KEY);
      2 $config->setPassword(NEXMO API SECRET);
       3
      4 $client = new OpenAPI\Client\Api\DefaultApi(
      5
                                        new GuzzleHttp\Client(), $config);
      6 $obj = new \OpenAPI\Client\Model\InlineObject();
      7
     8 try {
     9
                                         $result = $client->retrieveSecrets(NEXMO_API_KEY, $obj);
10
                            print_r($result);
11 } catch (Exception $e) {
                                         echo 'Exception when calling DefaultApi->retrieveSecrets: ', $e->getMessagetSecrets: ', $e->getMessage
12
13 }
```

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```
1 $config->setUsername(NEXMO API KEY);
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 3
 4 $client = new OpenAPI\Client\Api\DefaultApi(
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       echo 'Exception when calling DefaultApi->retrieveSecrets: ', $e->getMessag
12
13 }
```

