



# OpenAPI (f.k.a Swagger) Specification, Tools, and Frameworks

Software Working Group Round Table

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# Outline

- Brief Background on OpenAPI Specification
  - Definition
  - History
- Open API Documentation (Specification and Examples)
- Questions and Open Discussion



# OpenAPI Specification (OAS)

- Defines a **standard**, programming **language-agnostic** interface description for HTTP APIs, which allows both **humans and computers** to discover and understand the capabilities of a service **without requiring** access to source code, additional documentation, or inspection of network traffic.
- Originally based on the Swagger 2.0 Specification, donated by SmartBear Software in 2015
- OpenAPI Initiative (OAI) – a consortium of companies under the Linux Foundation with a focus on standardizing API descriptions – currently supports specifications like the OAS
- <https://spec.openapis.org/oas/latest.html>



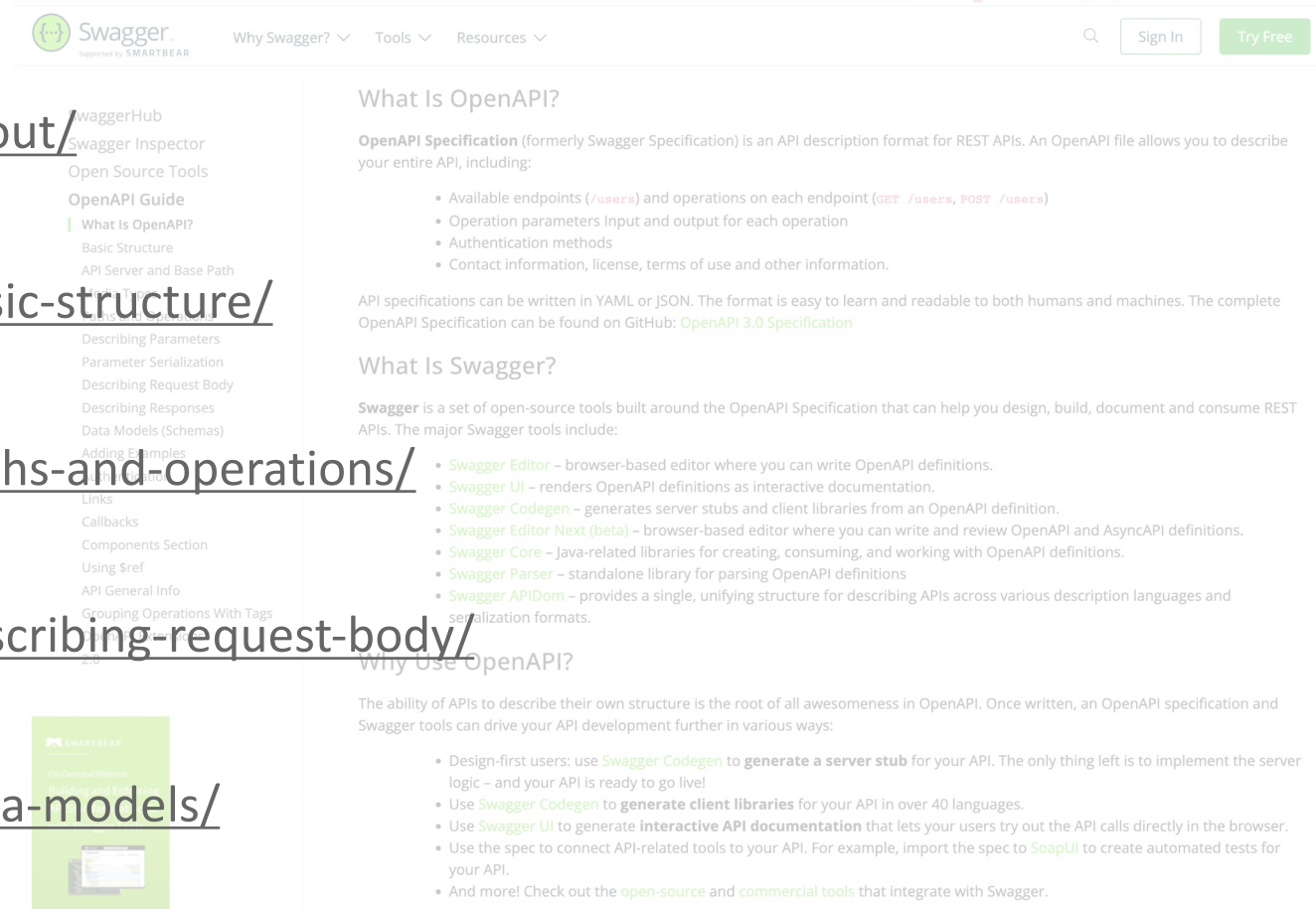
# A Brief History of OAS

- **Early 2010:** Initially developed at Wordnik (an online dictionary company)
- **Early 2015:** SmartBear Software acquired Swagger Spec. from Wordnik's parent company
- **Late 2015:** OAI (OpenAPI Initiative) was formed under the Linux Foundation
- **Early 2016:** Swagger Spec. was renamed to OpenAPI
- **Mid 2017:** OpenAPI Specification 3.0.0 got released
- More detailed (unofficial) history can be found here: *Bridging Systems and Subcultures: A Swagger Origin Story* ([https://www.youtube.com/watch?v=\\_G9dlv66-xw](https://www.youtube.com/watch?v=_G9dlv66-xw))



# OAS Documentation

- Landing Page
  - <https://swagger.io/docs/specification/about/>
- Basic Structure
  - <https://swagger.io/docs/specification/basic-structure/>
- Paths and Operations
  - <https://swagger.io/docs/specification/paths-and-operations/>
- Request Body
  - <https://swagger.io/docs/specification/describing-request-body/>
- Schemas
  - <https://swagger.io/docs/specification/data-models/>
- Adding Examples
  - <https://swagger.io/docs/specification/adding-examples/>



The screenshot shows the Swagger.io website. At the top, there is a navigation bar with the Swagger logo (Supported by SMARTBEAR), a search icon, and buttons for 'Sign In' and 'Try Free'. Below the navigation bar is a main content area with a left sidebar menu and a main content pane. The sidebar menu includes links for 'SwaggerHub', 'Swagger Inspector', 'Open Source Tools', 'OpenAPI Guide', 'What Is OpenAPI?', 'Basic Structure', 'API Server and Base Path', 'API Endpoints', 'Describing Parameters', 'Parameter Serialization', 'Describing Request Body', 'Describing Responses', 'Data Models (Schemas)', 'Adding Examples', 'API General Info', and 'Grouping Operations With Tags'. The main content pane is titled 'What Is OpenAPI?' and contains the following text: 'OpenAPI Specification (formerly Swagger Specification) is an API description format for REST APIs. An OpenAPI file allows you to describe your entire API, including:'. It lists several key features: 'Available endpoints (/users) and operations on each endpoint (GET /users, POST /users)', 'Operation parameters input and output for each operation', 'Authentication methods', and 'Contact information, license, terms of use and other information.'. Below this, it states 'API specifications can be written in YAML or JSON. The format is easy to learn and readable to both humans and machines. The complete OpenAPI Specification can be found on GitHub: OpenAPI 3.0 Specification'. The next section is 'What Is Swagger?' which states 'Swagger is a set of open-source tools built around the OpenAPI Specification that can help you design, build, document and consume REST APIs. The major Swagger tools include:'. It lists several tools: 'Swagger Editor - browser-based editor where you can write OpenAPI definitions.', 'Swagger UI - renders OpenAPI definitions as interactive documentation.', 'Swagger Codegen - generates server stubs and client libraries from an OpenAPI definition.', 'Swagger Editor Next (beta) - browser-based editor where you can write and review OpenAPI and AsyncAPI definitions.', 'Swagger Core - Java-related libraries for creating, consuming, and working with OpenAPI definitions.', 'Swagger Parser - standalone library for parsing OpenAPI definitions', and 'Swagger API Dom - provides a single, unifying structure for describing APIs across various description languages and serialization formats.'. The final section is 'Why Use OpenAPI?' which states 'The ability of APIs to describe their own structure is the root of all awesomeness in OpenAPI. Once written, an OpenAPI specification and Swagger tools can drive your API development further in various ways:'. It lists several benefits: 'Design-first users: use Swagger Codegen to generate a server stub for your API. The only thing left is to implement the server logic - and your API is ready to go live!', 'Use Swagger Codegen to generate client libraries for your API in over 40 languages.', 'Use Swagger UI to generate interactive API documentation that lets your users try out the API calls directly in the browser.', 'Use the spec to connect API-related tools to your API. For example, import the spec to SoapUI to create automated tests for your API.', and 'And more! Check out the open-source and commercial tools that integrate with Swagger.'



# Question 1

- What OpenAPI supported tools are you using for designing APIs? What are your experiences using these?
  - Swagger Editor (<https://editor.swagger.io/>)
  - Postman (<https://www.postman.com/api-design/>)
  - SwaggerHub (<https://app.swaggerhub.com/>)
  - ...



# Question 2

- What OpenAPI frameworks/tools are you using for developing APIs?  
What are your experiences using these?
  - Python Connexion (<https://connexion.readthedocs.io/en/stable/>)
  - FastAPI (<https://fastapi.tiangolo.com/>)
  - Swagger Codegen (autogenerates boilerplate code - <https://swagger.io/tools/swagger-codegen/>)
  - ...



# Question 3

- What OpenAPI supported tools are you using for documenting APIs?  
What are your experiences using these?
  - Swagger UI (<https://swagger.io/tools/swagger-ui/>)
  - Redoc (<https://github.com/Redocly/redoc>)
  - Apiary (<https://apiary.io/>)
  - ...





# Question 4

- What tools that can help with end-to-end API designing, development, and testing?
  - Postman
  - Newman (command line version of Postman)
  - SwaggerHub
  - ...



# References

- <https://www.openapis.org/>
- [https://en.wikipedia.org/wiki/OpenAPI\\_Specification](https://en.wikipedia.org/wiki/OpenAPI_Specification)
- <https://swagger.io/docs/specification/>
- <https://oai.github.io/Documentation/>
- <https://github.com/OAI/OpenAPI-Specification/blob/main/IMPLEMENTATIONS.md>

