JuliaHub

Using OpenAPI in Julia
Describe, Produce & Consume Web Services

May, 2023

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1. Introduction
2. Hands On
3. Summarize, Q&A

Slides & Notebooks:

https://github.com/tanmaykm/TalksAndMore/2023/OpenAPI/

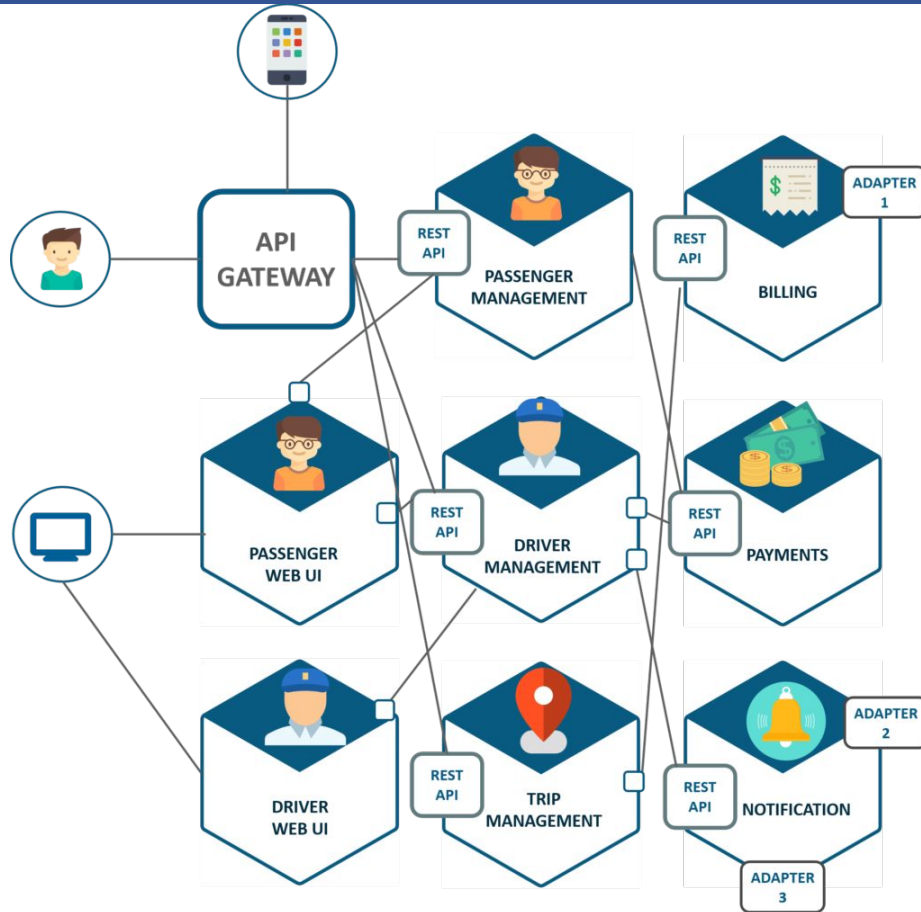Email: tanmay@juliahub.com | GitHub: @tanmaykm

1. Introduction

What is OpenAPI

Compare & Relate to Other Standards

OpenAPI in Julia & JuliaHub

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HTTP REST APIs - an example

Source: https://www.researchgate.net/publication/
342124274_Plug-and-play_mix-and-match_a_capital_systems_theory_of_digital_technology_platforms

What is OpenAPI

- ✓ **Interface Specification for HTTP APIs**

- ✓ **Leverages REST (REpresentational State Transfer)**
  - **- Web Service has Resources that clients can fetch**
  - **- Resources have States**
  - **- Actions create Resources or change States**

- ✓ **Standard & programming language agnostic**

Goal is to allow both humans & computers
to discover and understand the capabilities of a service (server)
without access to source code, documentation, or through network traffic inspection.

What is OpenAPI

Origins
- Donated to the OpenAPI Initiative by SmartBear Software
  - Renamed Swagger Specification to OpenAPI specification (2015)
- First official release (v3.0.0) in 2017

OpenAPI⇔Swagger
- OpenAPI = Specification (https://spec.openapis.org/oas/v3.1.0)
- Swagger = Tools for implementing the specification (https://swagger.io/tools/)

What is OpenAPI

- ✓ **Simple and widely understood**

- ✓ **~70% of APIs available have REST endpoints**
  (ref: https://smartbear.com/blog/an-introduction-to-restful-apis-infographic/)

- ✓ **Loosely speaking, OpenAPI is a specification for REST APIs**
  Narrower in scope than REST

- ✓ **Tools to help Create Specifications**

- ✓ **Tools to Generate Code, Documents, Tests**

What is OpenAPI
Compare & Relate to Other Standards

SOAP (Simple Object Access Protocol)

- ■ **Transport agnostic**
  - ● **e.g. HTTP, FTP**
- ■ **XML Data format only**
- ■ **Includes several extensions for peripheral protocols**
  - ● **e.g. WS-Security, WS-Addressing, WS-Federation**
- ■ **Verbose and complex**
- ■ **Suitable where extensions add significant value**

SOAP

What is OpenAPI
Compare & Relate to Other Standards

- **RPC Oriented**
  - **gRPC, ProtoBuf, Thrift**
  - **JSON RPC, XML RPC**
- **Graph APIs**
  - **GraphQL**

- **More special purpose**
- **Not as widespread**
- **But some are becoming popular**

OpenAPI in Julia

Specification Implementation

- **OpenAPI Generator**
  https://openapi-generator.tech/

- **OpenAPI.jl**
  https://github.com/JuliaComputing/OpenAPI.jl

- Swagger.jl
  https://github.com/JuliaComputing/Swagger.jl
  soon to be deprecated

API Integrations

- **Kubernetes** (Kuber.jl)

- **Azure Cloud** (Azure.jl)

- **Collaboration Tools**
  e.g. GitHub, Slack, ...

OpenAPI in JuliaHub

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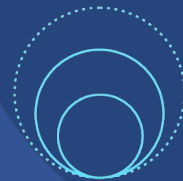
An enterprise computing platform for distributed, cost-effective, and reproducible computing. Optimised for Julia.

Run Apps & Scale Julia Jobs

Kubernetes

Data Catalog & App Storage

S3, EFS, EBS

Docs & Package Registry

Julia Pkg.jl

Julia IDE & Notebooks

VS Code, Pluto

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2. Hands On
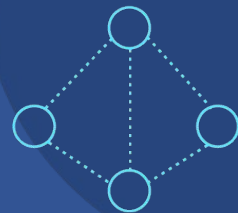
Quick Demo:
    Consume an API endpoint

Ground Up:
    Define, Serve & Consume APIs

Consume OpenAPI Endpoint

- Interface with GitHub

- OpenAPI specifications
  https://github.com/github/rest-api-description

- Notebook
  https://github.com/tanmaykm/TalksAndMore/2023/OpenAPI/

Define, Serve & Consume APIs

- Create a Specification

- Generate Code and Docs

- Implement & Deploy Service

- Use APIs in an application

- Notebook
  https://github.com/tanmaykm/TalksAndMore/2023/OpenAPI/

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3. Summarizing...

(Q&A)

- Discussed OpenAPI and related standards

- Quickly integrated with an existing service (GitHub)

- Defined a specification

- Implemented & Deployed a Service

- Accessed the service

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(Q&A)

Thank You!

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