API

WASA: Web and Software Architecture

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- definition of allowed interactions between two parts of software

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- definition of allowed interactions between two parts
  of software
    - possible requests
    - their parameters
    - return values
    - any data format they require

        CONSUMER <=> API <=> PROVIDER

API Benefits

- expilicit interface
- information hiding
- unbreakable contract

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- APIs for programming languages
- operating system APIs
- software libraries
- hardware APIs
- web APIs

Private vs. public APIs

- private: e.g., for internal use of a company
- public: available for use by the public
    - access may be restricted to some users only. API tokens
- Interface stability: changes may break compatibility with clients
    - mark parts that may change because not stable yet (beta)
    - mark parts as 'deprecated' if they will be removed or not supported in the future

API Definition

through documentation	through a description file
a free text explanation	a machine-readable specification
Possible cons:	Pros:
- incomplete or missing	- human- and machine-readable
- unclear	- automatic validation
- outdated	- code generation
	- mock servers (for testing)

OAS – OpenAPI Specification

- vendor-neutral description format for HTTP-based remote API
- industry standard for describing modern APIs
- broadly adopted

openapi.yaml

```yaml
openapi: 3.0.0
info:
  title: An example OpenAPI document
  description: |
    This API allows writing down marks on a Tic Tac Toe board
    and requesting the state of the board or of individual square
  version: 0.0.1
paths: {} # No endpoints defined yet
```

Let's play a game

Hi-Lo Game

- I think a secret number between 1 and 100
- You try to guess it in max 10 trials
- Each trial, I will tell you if your guess is too high, or too low

Hi-Lo Game Service Requirements

1. start a new game
2. accept a guess (up to 10 guesses), and return hi, lo, or correct
3. reset a game, generating a new secret number
4. obtain the list of each guess in a game, with related results
5. obtain the list of all games, with final result (win/lose) and number of guesses

Which resources would you design?

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References

- https://www.openapis.org
- https://oai.github.io/Documentation/

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