



REST API

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A cheat sheet for REST API principles, methods, and OpenAPI.

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Mental model

REST (Representational State Transfer) is an architectural style for designing networked applications. It treats data and functionality as resources accessed via standard HTTP methods. Clients and servers are decoupled, meaning the server does not store client state between requests.

HTTP methods

Method	Purpose	Idempotent
GET	Read a resource	Yes
POST	Create a resource	No
PUT	Replace a resource	Yes
PATCH	Modify a resource	No
DELETE	Delete a resource	Yes

Methods map to CRUD operations on resources.

Idempotent methods produce the same result whether called once or multiple times, which is crucial for safe retries.

POST /users HTTP/1.1

Content-Type: application/json

```
{"name": "Alice"}
```

Gotcha: PUT replaces the entire resource. If you only send one field in a PUT request, the server should typically nullify the missing fields. Use PATCH for partial updates.

Resource URLs

Pattern	Usage
/users	Collection of users
/users/123	Specific user
/users/123/orders	Orders for a user

URLs should identify resources (nouns), not actions (verbs). Hierarchy indicates relationships.

GET /users/123/orders HTTP/1.1

Accept: application/json

Tip: Keep URLs predictable. Avoid nested URLs deeper than two levels (e.g., /users/1/orders/2/items); instead, use the direct resource if possible.

Status codes

Range	Meaning	Common Examples
2xx	Success	200 , 201 , 204
4xx	Client Error	400 , 401 , 403 , 404
5xx	Server Error	500 , 502 , 503 , 504

Status codes tell the client how the server processed the request. They divide responsibilities: 4xx means the client must change the request, 5xx means the server failed.

Gotcha: Returning 200 OK with an error message in the body defeats standard HTTP caching and makes debugging harder for API consumers. Use appropriate error codes instead.

OpenAPI and Swagger

Term	Description
OpenAPI	The specification standard (YAML/JSON)
Swagger	Tooling ecosystem (UI, codegen)

OpenAPI is a formal specification for describing REST APIs. It defines endpoints, request shapes, and responses in a machine-readable format. Swagger refers to tools that implement this spec.

```
paths:
  /users:
    get:
      summary: List users
```

responses:

'200':

description: A list of users

Note: “Swagger spec” was renamed to “OpenAPI spec” in 2016. Today, you write OpenAPI documents and visualize them with tools like Swagger UI.

Further reading

- [Roy Fielding's Dissertation](#)
- [OpenAPI Specification](#)