

Python – Application Program Interface(API)



API

Definition:

- API stands for **Application Programming Interface**. It is a **set of rules and protocols** that allows **two applications to communicate** with each other.

Key Features:

- **Intermediary:** Acts as a bridge between different software applications.
- **Reusability:** Developers can use APIs to integrate existing functionality into their applications.
- **Flexibility:** APIs allow applications to exchange data securely and efficiently.

API Example

Example:

When you use an app to check the weather, the app communicates with a weather server's API to retrieve and display the weather data.

Work flow:

- **You:** Send a request (e.g., weather data).
- **Your Application:** Formats your request into an API call.
- **API Server:** Receives the API call, processes it, and fetches data.
- **API Response:** Sends back the requested data to your application.
- **Your Application:** Displays the result to you.

REST API

Definition:

- REST (Representational State Transfer) is a set of **architectural principles** used to **design** networked applications.
- A REST API uses HTTP requests to perform CRUD operations: **Create, Read, Update, and Delete** data.

Key Features:

- **Stateless:** Each request is independent and contains all the information needed to process it.
- **Uniform Interface:** Uses standard HTTP methods like GET, POST, PUT, and DELETE.
- **Scalability:** Designed to handle large numbers of client-server interactions efficiently.

REST API Example

Example:

- Request: GET https://api.openweathermap.org/data/2.5/weather?q=London&appid=your_api_key
- This REST API fetches weather data for London.

Breakdown:

- **GET:** This HTTP method tells the API that you want to **retrieve** data.
- ***https://api.openweathermap.org/data/2.5/weather:*** This is the **endpoint** or URL of the weather API
- ***q=London:*** This is a **query parameter** that tells the API you're interested in weather data for the city of London.
- ***appid=your_api_key:*** This is your **API key**, a unique identifier that lets the API know who is making the request.

Request

Definition:

- A message **sent by the client to the server** asking for **specific information** or action.

Key Features:

- **HTTP Method:** Determines the action (e.g., GET, POST).
- **URL/Endpoint:** The resource location (e.g., /weather).
- **Headers:** Provide metadata (e.g., API keys, content types).
- **Body:** (Optional) Contains data for actions like POST or PUT.

Example:

```
GET https://api.example.com/users/123  
Headers: { "Authorization": "Bearer token123" }
```

Response

Definition:

- The message **sent by the server back to the client** with the **requested data or result** of the action.

Key Features:

- **Status Code:** Indicates the result of the request (e.g., 200 OK, 404 Not Found).
- **Headers:** Provide metadata (e.g., content type, server info).
- **Body:** Contains the requested data or error details.

Example:

```
{  
  "id": 123,  
  "name": "John Doe",  
  "email": "john.doe@example.com"  
}
```

Thank You!

