Web Application **P**rogramming **I**nterface (**API**)

Sweety Mohanty

What is an **A**pplication **P**rogramming **I**nterface (**API**)?

A makeshift resemblance:

Entity – I

Entity – II

Entity - III

Source: https://www.geeksforgeeks.org/what-is-an-api/

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If we substitute these entities with technical terms :) ?

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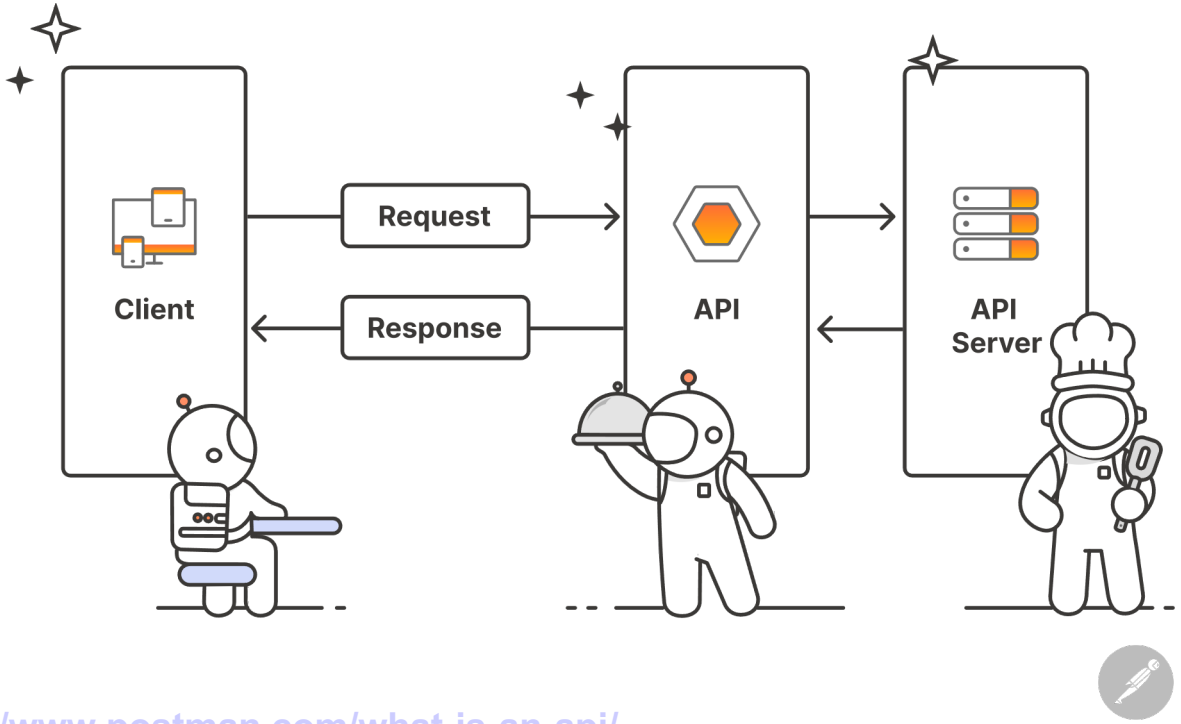
What is an **A**pplication **P**rogramming **I**nterface (**API**)?

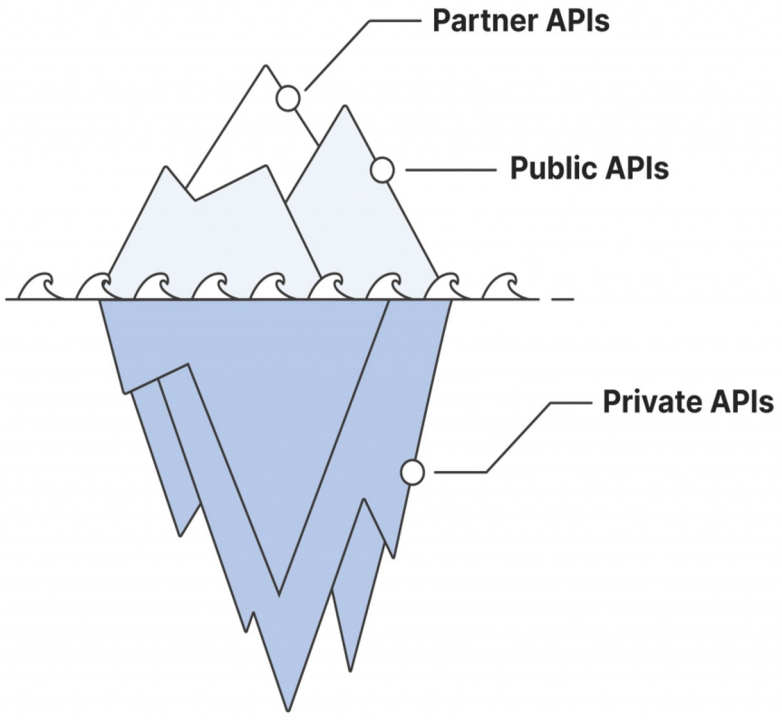
An API (Application Programming Interface) is **a set of rules** that allows different software applications to communicate with each other.

- Facilitates interactions between different systems.
- Allows developers to use functionalities without needing to understand their internal workings



A good read: https://www.postman.com/what-is-an-api/

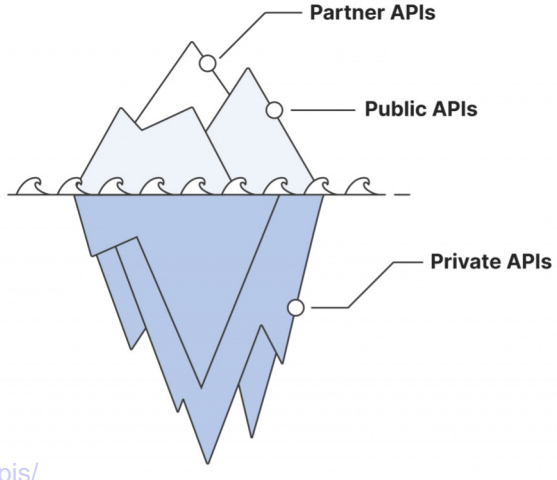
Types of API based on accessibility



Source: https://blog.postman.com/why-the-cloud-100-is-a-list-of-apis/

Types of API based on accessibility

API Type	Characteristics	Accessibility	Examples
Public API	Openly available, minimal restrictions, often requires registration or API key	Accessible by anyone.	Ex: ?
Private API			
Partner API			



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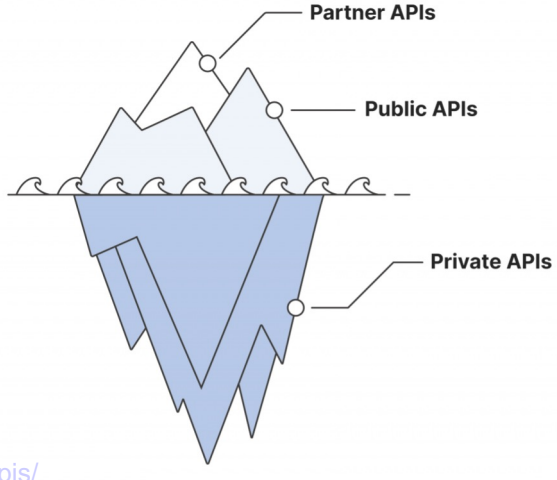

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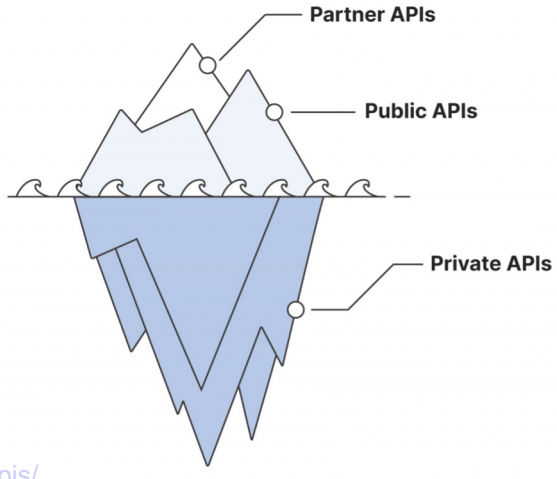

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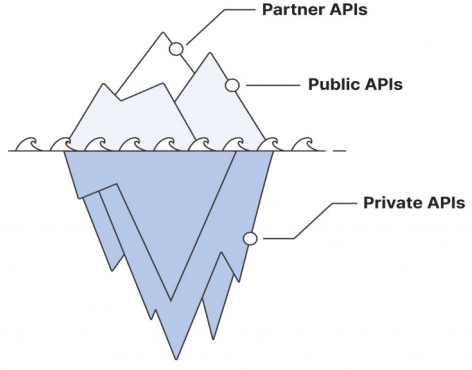

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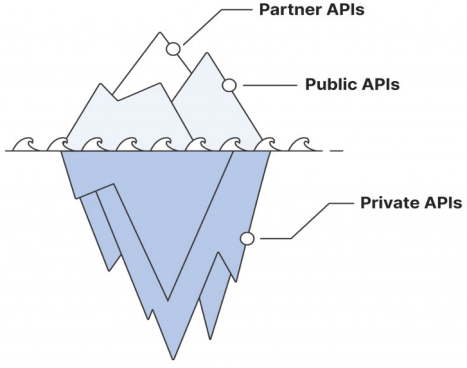

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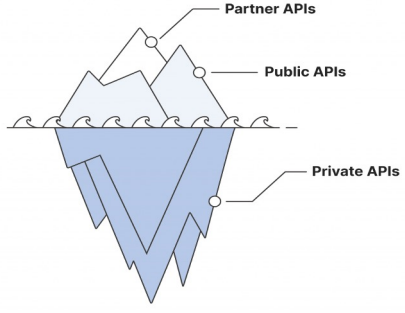

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Does API have to be web-based?

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Not really!

Any example?

Examples of some non-web API

Bluetooth API

- Most fitness trackers use a Bluetooth API to sync data with a smartphone app, allowing the app to retrieve health metrics like steps and heart rate.

USB API

- A software application will use a USB API to read data from an external USB drive, manage data transfers, or interact with a USB-connected sensor.

Library API

- The package seaborn (a data visualization library) communicates with matplotlib and pandas constantly.

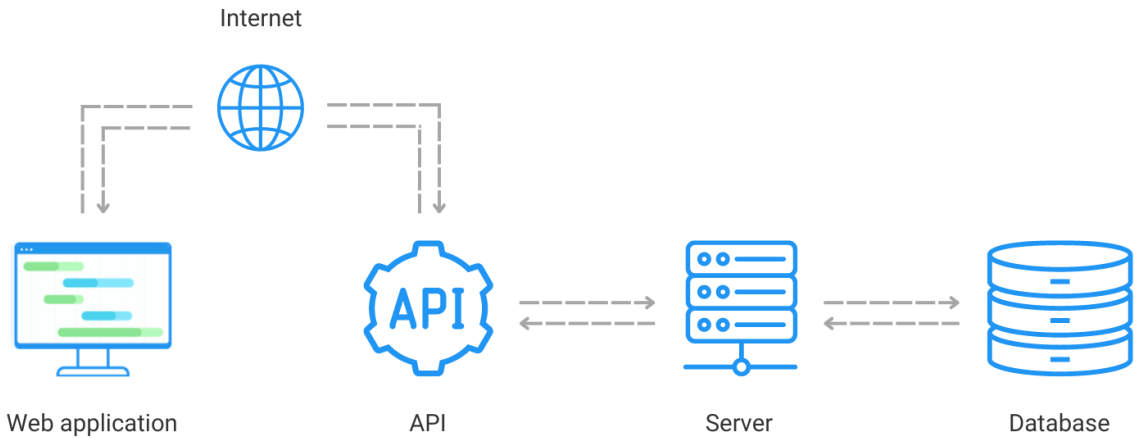
Web API

A **web API** is an API that

- can be accessed using the **Hypertext Transfer Protocol (HTTP)**.
- is used to communicate between **two computers connected remotely over the internet**.

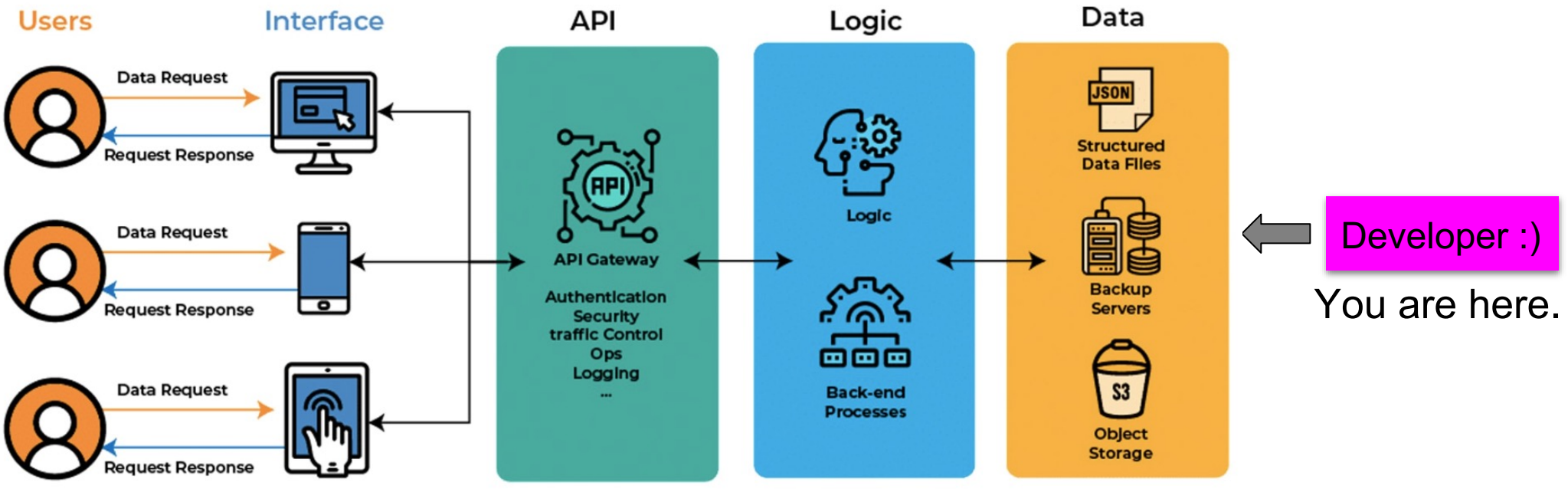
Common Usage examples:

- Checking the current weather conditions and forecast
- Searching for flights, hotels, and rental cars for holidays
- Posting on social media



Source: https://dhtmlx.com/blog/web-apis-used-dhtmlx-widgets/

In this course...



Source: https://itsmeccanicabruzzo.eu/le-api-cosa-sono-e-perche-sono-importanti/

What to keep in mind when using APIs

Versioning:
Keep an eye out for different versions of API available to ensure data integrity for the tasks at hand

Rate Limits:
Take a note of rate limits imposed by APIs to avoid service disruption.

Documentation:
Read and understand the API documentation to smoothly implement and utilize the API.

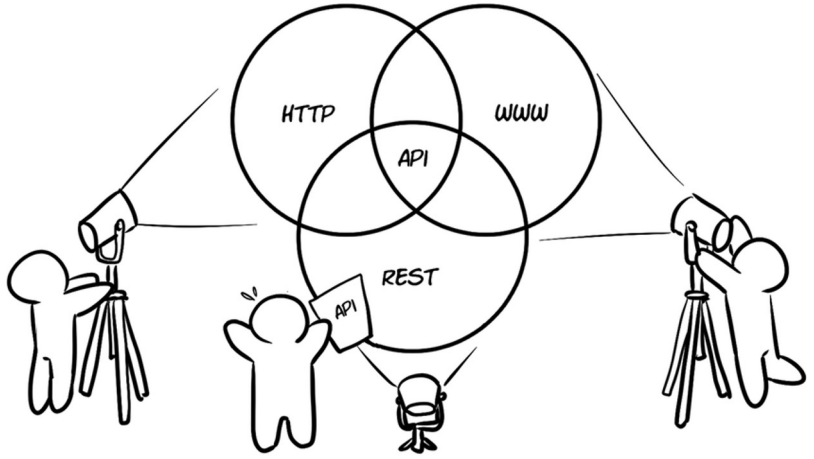
Authentication and Security:
Use secure methods like OAuth 2.0, API keys, and adhere to best practices for data security.

Data Privacy and Compliance:
Check and follow the data privacy laws and compliance requirements relevant to the data you are accessing or sharing.

Next Steps

A) Try out the API tutorial

B) Check out this repository for a humongous list of APIs as inspiration:
https://github.com/public-apis/public-apis?tab=readme-ov-file



Source: https://www.oreilly.com/library/view/design-and-build/9781680508123/f_0019.xhtml

Some more slides...

Types of API Protocols

- **Rest APIs:** RESTful APIs adhere to the principles of REST, which include statelessness, uniform interface, client-server architecture, and more. They use standard HTTP methods (GET, POST, PUT, DELETE) to perform CRUD (Create, Read, Update, Delete) operations on resources.

- **SOAP:** SOAP (Simple Object Access Protocol) APIs use XML-based messaging protocol for communication. They provide a standardized way of integrating web services regardless of the programming language or platform.

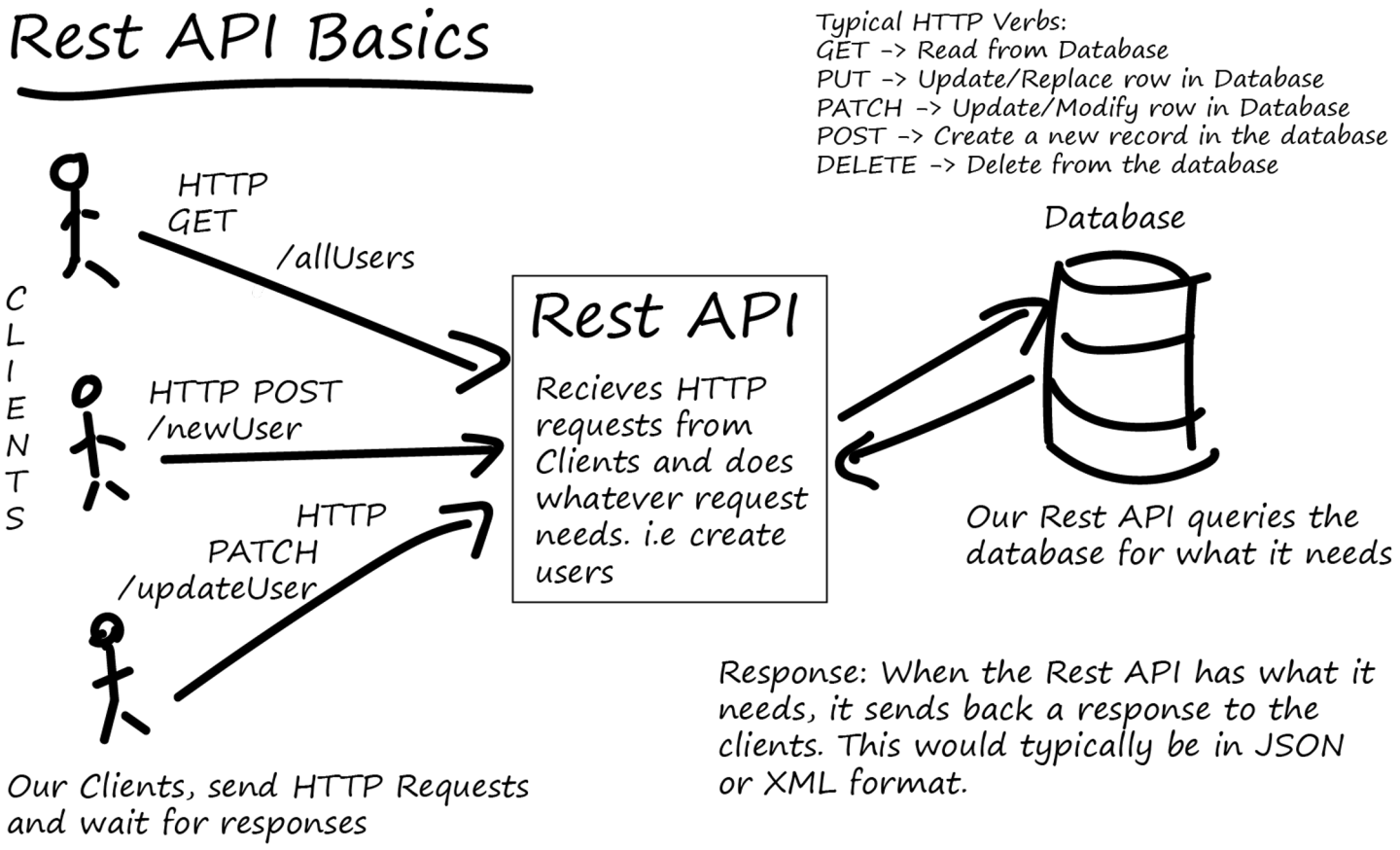
- **GraphQL:** GraphQL APIs allow clients to query only the data they need. Unlike REST APIs where endpoints return fixed data structures, GraphQL APIs enable clients to specify the structure of the response, reducing over-fetching or under-fetching of data.

- **gRPC:** gRPC Remote Procedure Call is an open-source remote procedure call (RPC) framework developed by Google. It is designed to be highly efficient, low-latency, and language agnostic, enabling communication between distributed systems and microservices.

- **WebSockets:** WebSocket APIs enable bidirectional communication between clients and servers over a single, long-lived connection. They are ideal for real-time applications such as chat applications, gaming, and live updating dashboards.

Read more at: https://blog.postman.com/rest-api-examples/

Representational State Transfer Application Programming Interface



Source: https://tutorialedge.net/software-eng/what-is-a-rest-api/