**API:**

In brief, an API (Application Programming Interface) is a set of rules, protocols, and tools that allows different software applications to **communicate with each other**. It defines how software components should interact, providing a standardized interface for accessing functionality and services. APIs enable

* interoperability,
* abstraction of complexity, and
* the integration of diverse systems,

ultimately facilitating the development of more powerful and flexible software solutions.

**Different types of API**

1. **REST APIs**
2. **SOAP api**

**REST API** :

* Representational State Transfer
* It is a web-based application programming interface
* REST is an architectural style that uses a stateless, client-server, cacheable communication protocol (usually **HTTP**).
* They typically utilize standard HTTP methods like GET, POST, PUT, and DELETE to perform actions on resources.
* REST APIs are designed around resources, which are any kind of object, data, or service that can be accessed by the client.
* REST APIs often use lightweight data interchange formats like JSON or XML for data exchange.
* They emphasize simplicity, scalability, and performance.

**When to use?**

REST APIs are widely used in modern web development and are suitable for a wide range of applications, such as

* App with cruid operation
* Where real-time communication (Whats App, messages)
* Streaming services (Netflix, Amazon Prime)

**SOAP API** :

* Simple Object Access Protocol
* SOAP is a protocol for exchanging structured information in the implementation of web services.
* SOAP APIs use XML for message format and can use various transport protocols like HTTP, SMTP, or JMS.
* They define a strict envelope structure for messages, including headers and bodies, which can include complex data types and structures.
* SOAP APIs support features like security, transactions, and reliability, making them suitable for enterprise-level applications.
* SOAP APIs are often associated with more heavyweight and complex integration scenarios.

When to use?

* They have traditionally been used in environments where strict contract, security, and standards compliance are required.
* Example enterprise level application

**REST APIs vs SOAP Api**

REST APIs are simpler, more lightweight, and suitable for a wide range of applications, while SOAP APIs are more complex, feature-rich, and commonly used in enterprise environments requiring strict standards compliance and advanced functionality. The choice between them depends on factors such as the specific requirements of the project, existing infrastructure, and developer preferences.

**FastAPI**

FastAPI is a modern, fast (high-performance), web framework for building APIs with Python. It is built on top of standard Python type hints and is designed to be easy to use, intuitive, and efficient. FastAPI leverages Python's type system to provide features like automatic data validation, serialization, and documentation generation, making API development faster and more productive.

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