## **Introduction to Web API**

### **🔹 What is a Web API?**

A **Web API (Application Programming Interface)** is a platform that allows different software systems to communicate with each other over the internet using standard protocols like HTTP.

Web APIs enable data exchange and functionality sharing between a **client** (like a browser, mobile app, or another server) and a **server**.

### **🔹 Key Features of Web APIs:**

* **Stateless Communication**: Each request is independent and doesn't retain user state.
* **HTTP-based**: Uses methods like GET, POST, PUT, DELETE for communication.
* **Lightweight**: Often returns data in JSON or XML format.
* **Platform-Independent**: Clients and servers can be built with different technologies.

### **🔹 Common HTTP Methods:**

| **Method** | **Purpose** |
| --- | --- |
| GET | Retrieve data |
| POST | Create new resource |
| PUT | Update existing data |
| DELETE | Remove data |

### **🔹 Web API Architecture:**

*(Image shows client sending requests to server via HTTP; server processes and responds with data.)*

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## **Benefits, Use Cases & Tools**

### **🔹 Benefits of Using Web APIs:**

* ✅ **Scalability**: Enables services to be distributed and scaled easily.
* ✅ **Flexibility**: Clients and servers are loosely coupled.
* ✅ **Reusability**: APIs can be reused by different clients (web, mobile, etc.).
* ✅ **Integration**: Makes it easy to integrate third-party services like payment gateways, social logins, etc.

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### **🔹 Real-World Use Cases:**

* **Social Media Integration**: Facebook, Twitter, Instagram APIs.
* **E-commerce**: Payment APIs like PayPal or Razorpay.
* **Weather Data**: APIs that provide real-time forecasts.
* **Maps and Location**: Google Maps API for navigation.

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### **🔹 Common Tools & Technologies:**

* **Postman**: For testing APIs.
* **Swagger/OpenAPI**: For documenting APIs.
* **ASP.NET Web API (C#)**: A framework to build RESTful services.
* **Node.js/Express**: Popular stack for JavaScript-based APIs.
* **Flask/Django REST**: Python-based web frameworks for APIs.

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### **🔹 Example (RESTful Web API Endpoint):**

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GET https://api.example.com/products

Response:

[

{

"id": 1,

"name": "Laptop",

"price": 899.99

}

]