Documentation on Web API

# What is a Web API?

A Web API (Web Application Programming Interface) is a way for different software applications to communicate with each other over the internet. It allows one software to send data to another or request data from it using HTTP protocols like GET, POST, PUT, and DELETE.  
  
In simple terms, a Web API is like a waiter in a restaurant. The customer (client) tells the waiter what they want (a request), and the waiter goes to the kitchen (server), gets it, and brings it back (a response).

# Why Do We Use Web APIs?

- To connect web or mobile apps to servers  
- To send and receive data  
- To integrate different systems (e.g., weather apps showing data from weather servers)  
- To perform operations like user login, data upload, chat, etc.

# Components of a Web API

## 1. Request

The client sends a request to the server. It contains:  
- URL (Endpoint): The address where the request is sent (e.g., https://api.example.com/users)  
- HTTP Method: Type of action like GET, POST, etc.  
- Headers: Extra info (like API keys)  
- Body: Data sent to the server (in POST/PUT requests)

## 2. Response

The server processes the request and sends back a response. It contains:  
- Status Code (e.g., 200 for success, 404 for not found)  
- Body: Data returned by the server (often in JSON format)

# Common HTTP Methods

|  |  |
| --- | --- |
| Method | Description |
| GET | To fetch data from the server |
| POST | To create new data on server |
| PUT | To update existing data |
| DELETE | To remove data from server |

# Example: Simple Web API Flow

Use Case: A mobile app wants to get the list of users.  
  
1. Client sends a GET request to:  
 https://api.example.com/users  
  
2. Server responds with:  
[  
 { "id": 1, "name": "Divyanshu" },  
 { "id": 2, "name": "Shruti" }  
]

# Security in Web APIs

Web APIs use different methods to keep data safe:  
- API Keys: Secret keys used for access  
- OAuth: Secure login using third-party accounts (like Google)  
- JWT (JSON Web Tokens): Tokens passed in requests to verify users

# Popular Frameworks and Tools

|  |  |
| --- | --- |
| Language | Framework/Tool |
| Java | Spring Boot |
| C# | ASP.NET Web API |
| JavaScript | Express.js (Node.js) |
| Python | Flask, Django REST |
| PHP | Laravel API |

# Benefits of Using Web API

- Easy to integrate different systems  
- Allows data sharing between applications  
- Supports mobile and web applications  
- Helps build scalable and maintainable software

# Conclusion

Web APIs play an important role in modern software development. They allow different apps and services to talk to each other smoothly and securely. Understanding how to use and build APIs is a must-have skill for every software developer today.