**Web API – An Overview**

**What is a Web API?**

A **Web API (Application Programming Interface)** is a set of rules and endpoints that allow different software applications (especially frontend and backend) to communicate over the HTTP protocol.

It acts as a **middle layer** between:

* **Presentation Layer (UI)** – Built using Angular, React, etc.
* **API Layer** – Handles business logic.
* **Database Layer** – Stores and retrieves data.

**Web Application Architecture**

Presentation Layer │ ← React / Angular

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Web API Layer │ ← Business Logic (.NET Core, Java, Node.js)

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Database Layer │ ← SQL Server, MongoDB, etc.

**Why Use Web APIs?**

* Decouples frontend and backend
* Centralizes business logic
* Scales easily
* Enables cross-platform communication (e.g., mobile apps + web)

**Web API in Action (Example: Amazon)**

| **User Action** | **HTTP Verb** | **API Functionality** |
| --- | --- | --- |
| Search for "Laptop" | GET | Fetch product data from database |
| Add to Cart | POST | Insert item into cart |
| Update quantity in Cart | PUT | Update item quantity in the cart table |
| Remove from Cart | DELETE | Remove item from cart in database |

**HTTP Verbs & Use Cases**

**HTTP Verbs (CRUD Mapping)**

| **HTTP Verb** | **Operation** | **Database Equivalent** |
| --- | --- | --- |
| GET | Read/Retrieve data | SELECT |
| POST | Create new data | INSERT |
| PUT | Update data | UPDATE |
| DELETE | Remove data | DELETE |

**Use Case Examples**

**1. Login to Facebook**

* **Action:** Validate credentials
* **Verb:** POST
* **Why:** You’re submitting data (email, password) to verify.

**2. View News Feed**

* **Action:** Pull latest posts
* **Verb:** GET
* **Why:** You're fetching existing data to display.

**3. Post a Comment**

* **Action:** Add a comment to a post
* **Verb:** POST
* **Why:** You are inserting a new comment into the system.

**4. Edit Profile Info**

* **Action:** Change profile name or photo
* **Verb:** PUT
* **Why:** You are updating existing data.

**5. Delete a Post**

* **Action:** Remove your status update
* **Verb:** DELETE
* **Why:** You are permanently deleting data.

**Key Benefits of Web APIs**

* Reusability across different platforms
* Centralized authentication & security
* Easy maintenance and updates
* Supports mobile, desktop, and web apps