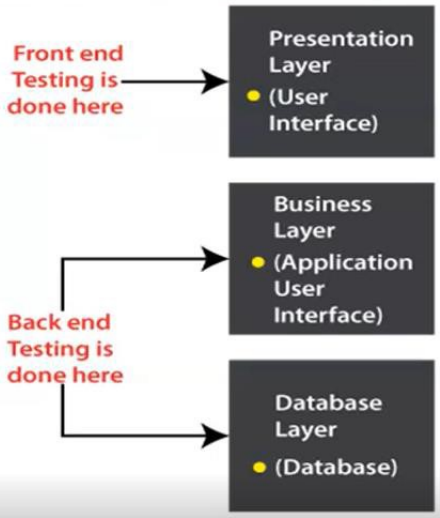
Web Services Testing

Frontend Testing VS. Backend Testing

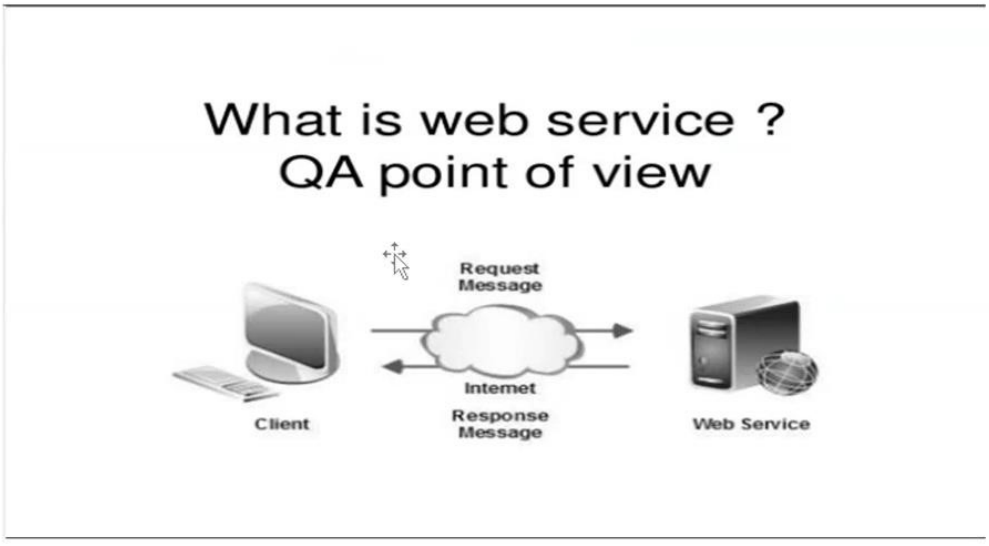


Frontend testing	Backend testing
Frontend testing is always performed on the GUI.	Back End Testing involves databases and business logic testing.
GUI is used to perform the Testing	GUI may or may not be used to perform Testing
It does not need any information to be stored in a database.	It does need information stored in the database.
Types of Testing done are – Unit Tests, Acceptance Testing, Accessibility Testing, Regression Testing, System testing etc.	Three widely used types of database testing are SQL Testing, API Testing, etc.

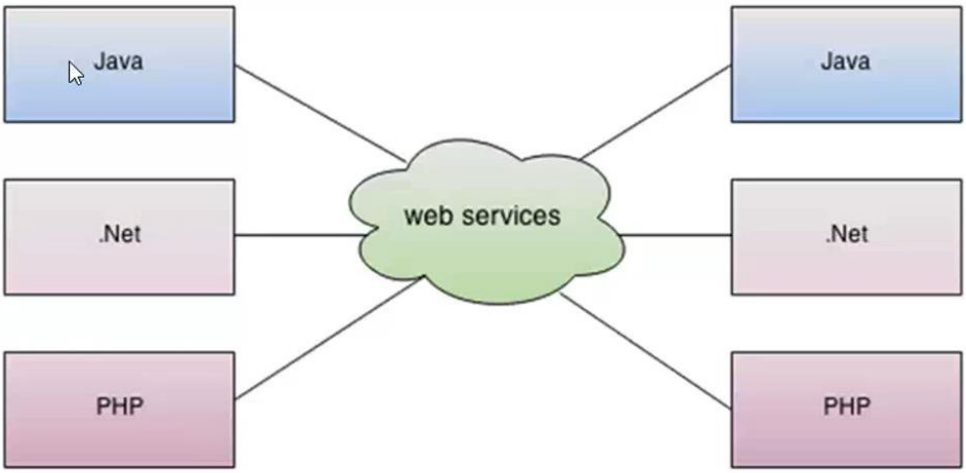
By:-Pravin Kumar Jha

1. What is Webservices?
2. Why Web Services is so popular?
3. Overview of SOAP Webservices & REST Webservices?
4. What is REST API?
5. How is Different from SOAP Webservices?
6. Base URL and REST Resources?
7. Understanding of GET, POST, PUT, PATCH, DELETE.

- Services available over the web
- The method of communication between two devices or application over the network.
- Enable communications between applications over the web
- Platform independent communication
- Using web services two different applications(Implementation) can talk to each other and exchange data/information



Web Service Architecture Diagram

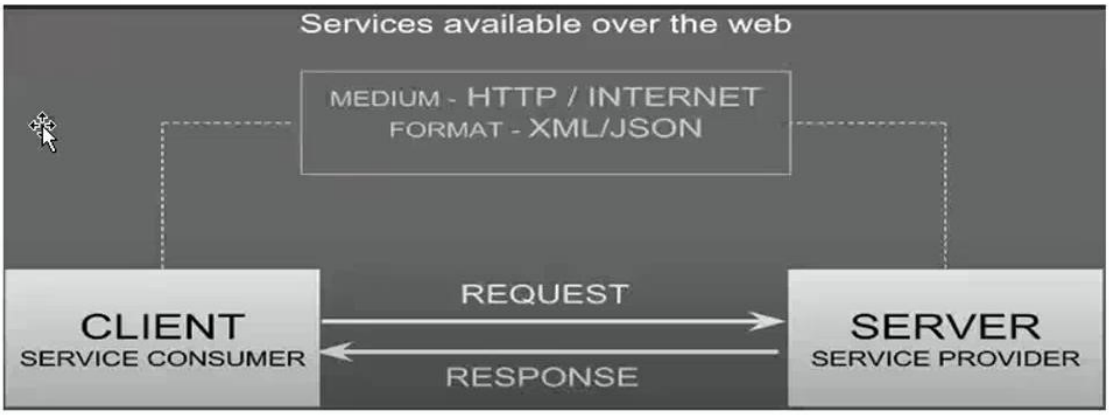


- Platform independent communication:

As you can see in the figure, Java, .net, and PHP applications can communicate with other applications through web service over the network. For example, the Java application can interact with Java, .Net, and PHP applications. So web service is a language independent way of communication.

Service Provider:

A web service provider develops/Implements the application(Web Service) and Makes it available over the Internet(Web)

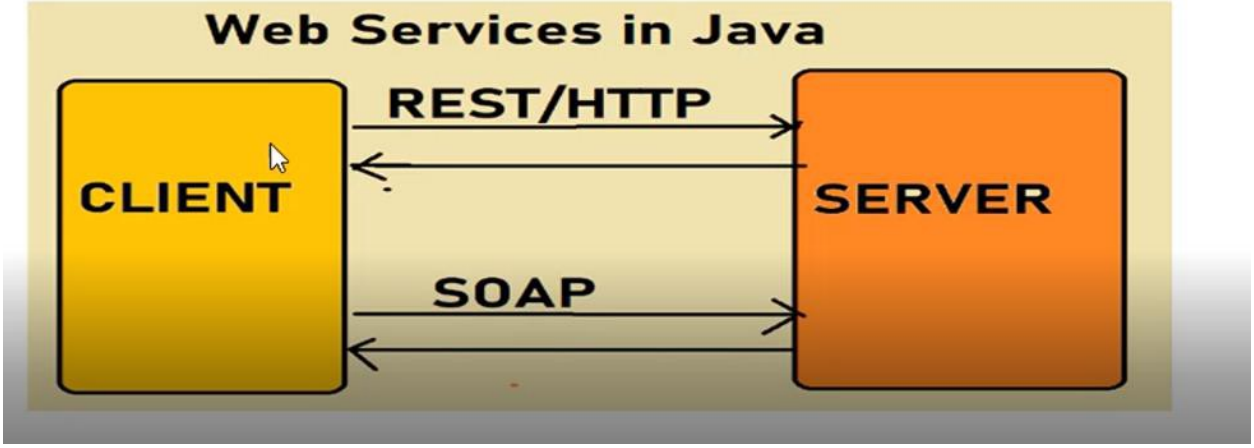


Types of Web Services

There are mainly two types of web services.

1. **SOAP web services.**
2. **RESTful web services.**

SOAP	REST
Simple Object Access Protocol	REpresentational State Transfer
Medium : HTTP (POST)	Medium : HTTP (POST,GET,PUT, DELETE,...)
Format : XML	Format : XML/JSON/TEXT...



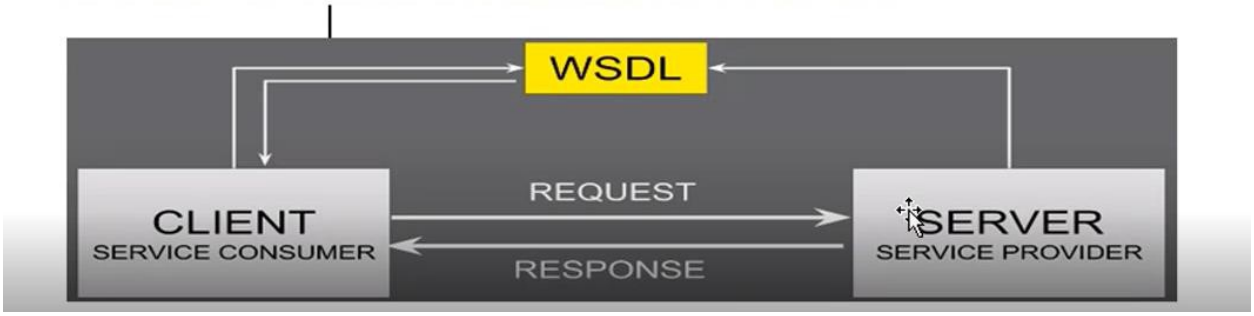
SOAP Web Servic

WSDL/UDDI

Service Provider publishes an interface for his web services that describes all attributes of the Web services.

This is XML based interface and is Called **Web Services Description Language- WSDL**

https://graphical.weather.gov/xml/SOAP_server/ndfdXMLserver.php?wsdl



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UDDI

A Web service provider publishes his web service(Through WSDL) on an online directory from where consumers can query and Search the web services.

This online registry/directory is called **UDDI(Universal Description ,Discovery and Integration)**

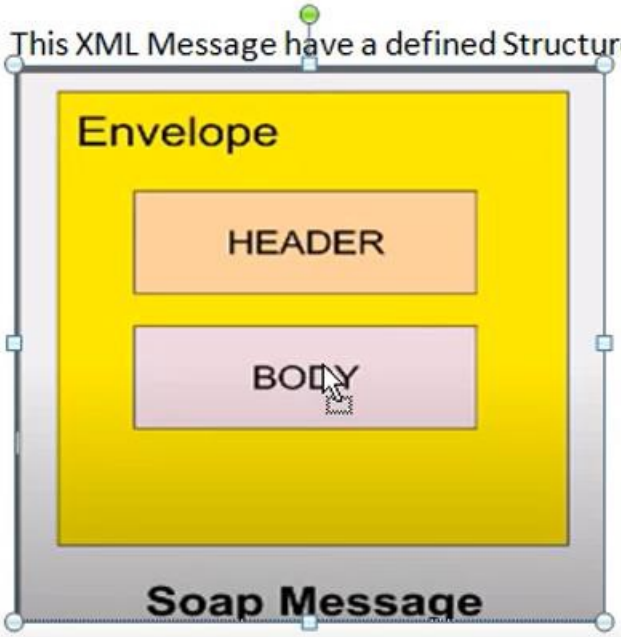
--In Soap Services we have some guideLine/Standard and rule which we have to follow

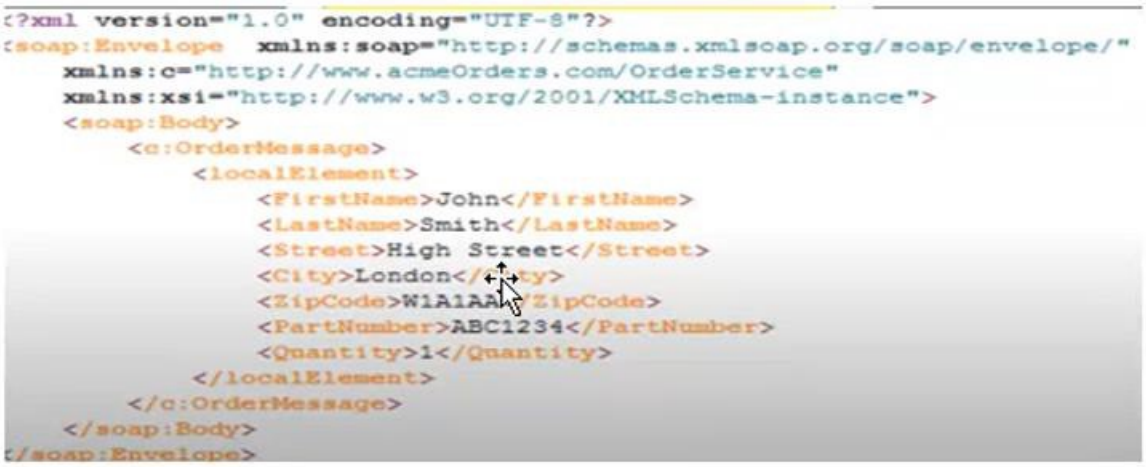
And this define by **W3C(World wide web Consortium): An International community that develops open standards for world wide web.**

SOAP:

Protocol/Rules/Definitions how 2 Applications will Talk to each other over the Web

This XML Message have a defined Structure:SOAP MESSAGE





```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope  xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:c="http://www.acmeOrders.com/OrderService"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <soap:Body>
        <c:OrderMessage>
            <localElement>
                <FirstName>John</FirstName>
                <LastName>Smith</LastName>
                <Street>High Street</Street>
                <City>London</City>
                <ZipCode>W1A1AA</ZipCode>
                <PartNumber>ABC1234</PartNumber>
                <Quantity>1</Quantity>
            </localElement>
        </c:OrderMessage>
    </soap:Body>
</soap:Envelope>
```

Disadvantage of Soap Web Service

Slow: SOAP uses XML format that must be parsed to be read. It defines many standards that must be followed while developing the SOAP applications. So it is slow and consumes more bandwidth and resource.

WSDL dependent: SOAP uses WSDL and doesn't have any other mechanism to discover the service.

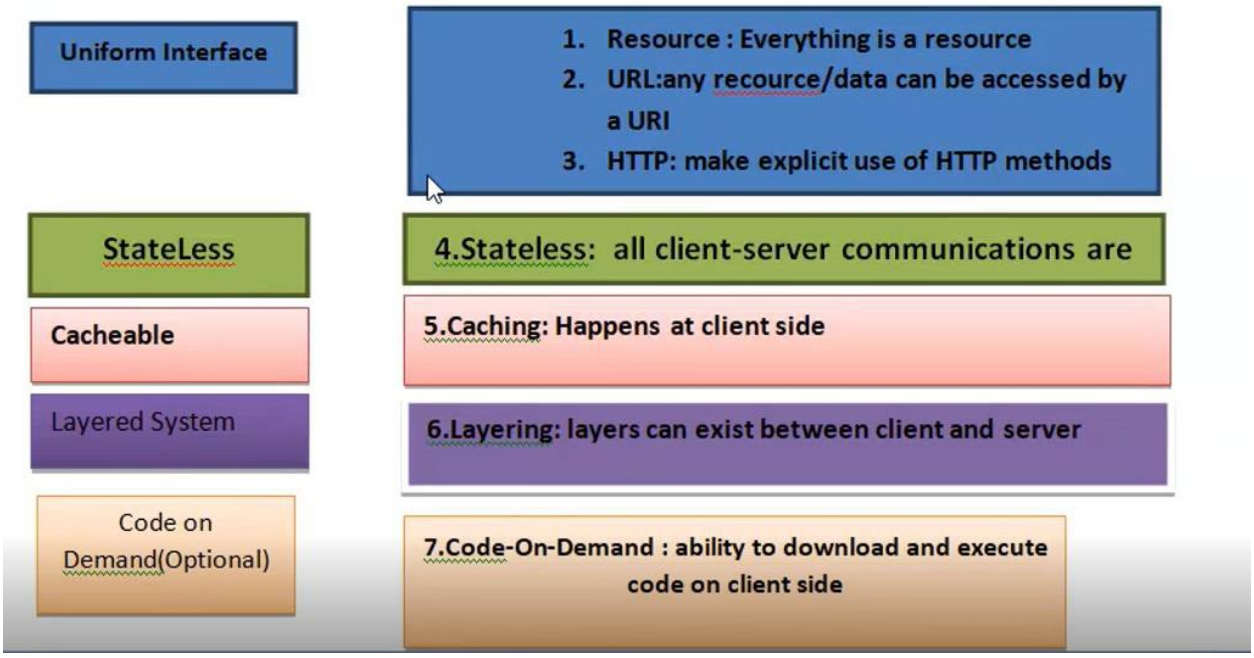
What are RESTFul Web Services?

REST:
(Representational State Transfer)
Is an architectural style
API: Application programming interface

REST defines a set of principles to be followed while designing a services for communication /data exchange between 2 Appliction

When these principles are applied while designing web services(For client-server interactions) We get : **RESTful Web Services**

What are the principles/constraints of REST architecture?



Examples:-

https://www.makemytrip.com/hotels/search?itinerary=BOM-DEL-30/04/2021

- **Protocol**: https (**H**yper **T**ext **T**ransfer **P**rotocol)
- **Base Url**: www.makemytrip.com
- **Resourse**: After the first Forward slash i..e hotels. REST architecture treats all of its content as a resource, which includes Html Pages, Images, Text Files, Videos, etc
- **Query Parameter**: After the first Question mark, Which users try to search(filter)
- **Host URl**: Protocol + Base Url
- **WWW** is about communication between web **clients** and **servers**
- **HTTP Request / Response**

Communication between clients and servers is done by **HTTP requests** and **HTTP responses**:

1. A client (a browser) sends an **HTTP request** to the web
2. A web server receives the request
3. The server runs an application to process the request
4. The server returns an **HTTP response** (output) to the browser
5. The client (the browser) receives the response

Top 10 API testing tools

By:-Pravin Kumar Jha

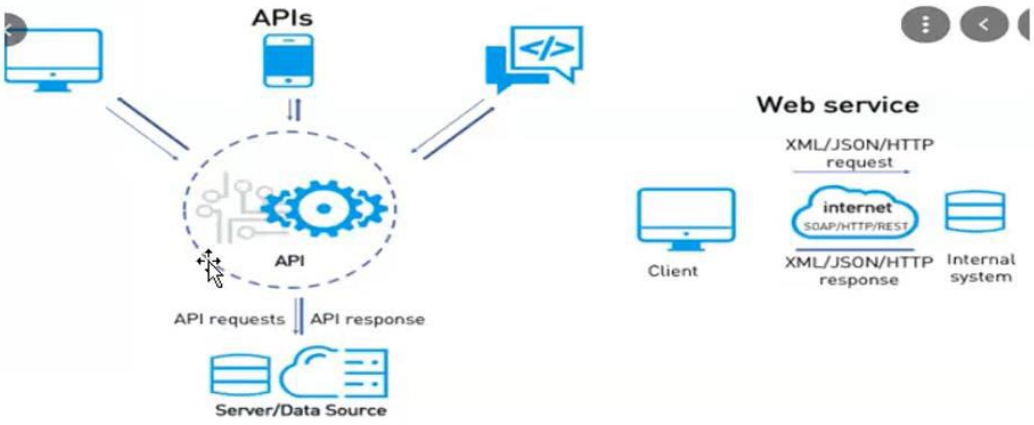
API(Application Programming Interface)

1. API stands for Application Programming Interface
2. It is a mechanism that allows the communication between two applications,components or computer hardware using set of rules and protocols
3. An API can be written and used for
    - **Web Based applications**: Any API's which implemented with web server over http and https protocol
    - **Computer operating system**: Can be communicate between two computer OS like Mouse and desktop i.e COM (Component Object Model) API
    - **Database Systems**
    - **Computer Hardware**
    - **Software Library** : Selenium jar file

Web Services V/S API's

The web services are the implementation of API's to communicate between 2 Applications over a network,usually http or https.

1. Web Service is an API wrapped in Http.
2. Web Service needs a network,however, an API does not need a network.
3. All Web Services are APIs but all APIs are not Web Services.



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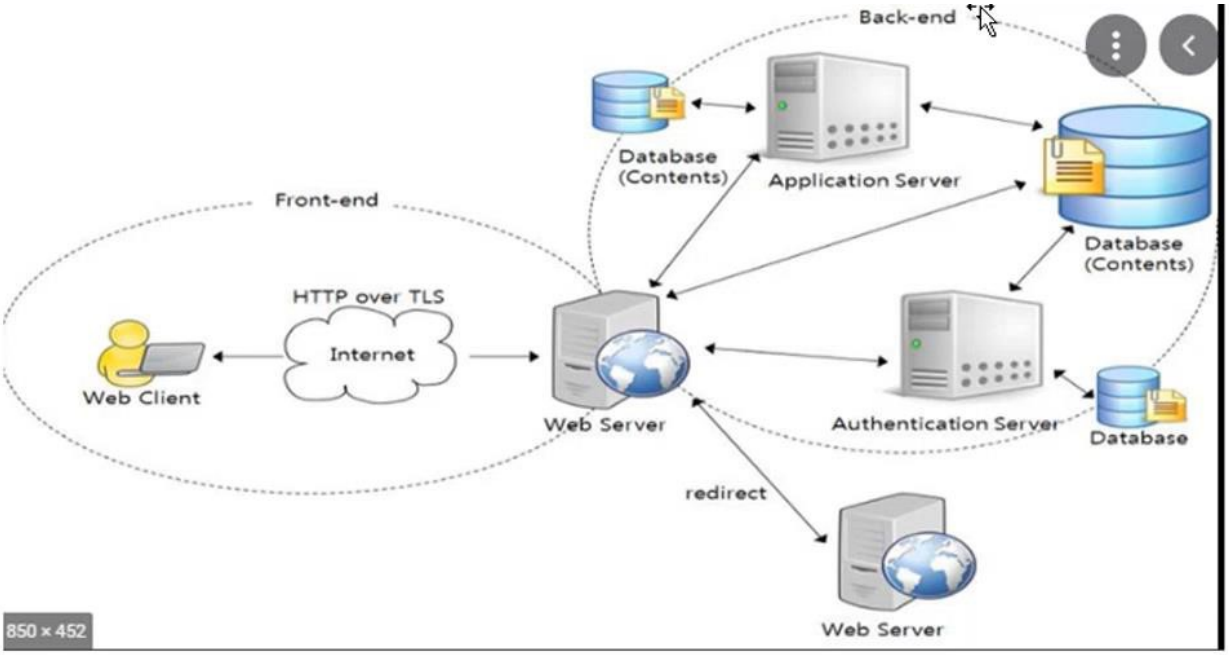

For the practice purpose will create own JSON Server

1.Check the Node version in cmd(using the cmd node –v) if node is not installed in your machine then Download the node Js.https://nodejs.org/en/download/

2.Verify the npm version using the cmd **npm –v**

3. And install the json server in local machine using the below cmd.

```
npm install -g json-server
```

4. To start the server

```
json-server --watch db.json
```

4. To start the server

```
json-server --watch db.json
```

In your C drive (default path) db.json file get created with some default data.

```
{
  "posts": [
    { "id": 1, "title": "json-server", "author": "typicode" }
  ],
  "comments": [
    { "id": 1, "body": "some comment", "postId": 1 }
  ],
  "profile": { "name": "typicode" }
}
```

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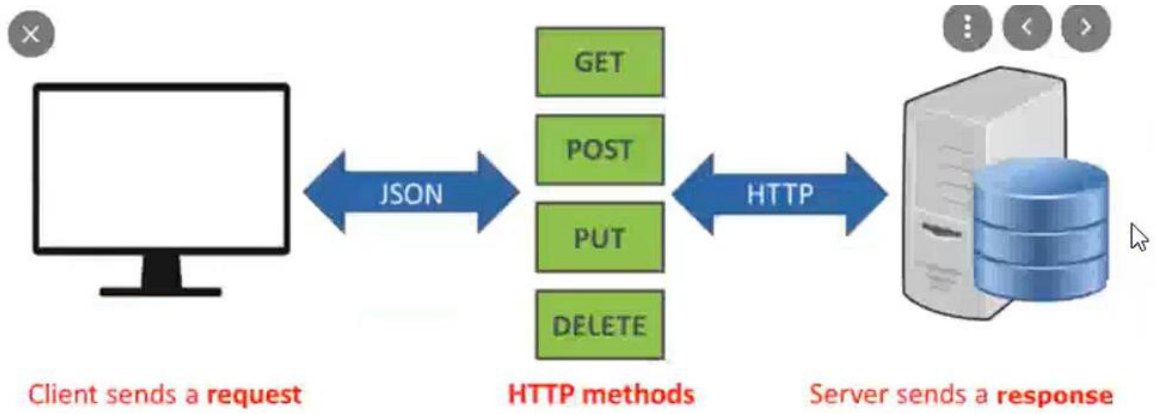
There are mainly 5 methods involve in API Testing like GET, POST, DELETE, PUT and PATCH.

HTTP Verb/Method	CRUD	Actions
POST	Create/Update	A POST request is used to create a new entity. Or update the existing entity
GET	Read	Extract/Fetch/Read the data from the data base
PUT	Update/Replace	Update/Replace an existing data from the data base
PATCH	UPDATE	Update the data
DELETE	Delete	Remove the data from the data base



What is JSON?

JSON stands for **J**ava**S**cript **O**bject **N**otation

--Define the Structure of a JSON Message

--Can use to Validate API request and Response

--LightWeight and Easy to Read/Write

--Integrate Easily with Most Languages