API Testing using POSTMAN Tool

**Topics**

1. Understanding of Client and Server
2. Client / Server Architecture
3. Presentation Layer – Business Logic Layer – Database Layer
4. Basic Defination of API
5. **API Testing**, Requirements to Do API Testing
6. **Webservices**
7. Difference bw **API** and **Webservices**
8. Types of **Webservices**
9. **SOAP** Webservices
10. **REST** Webservices
11. Types of **Request** ( GET , PULL , POST , DELETE )
12. **Downloading** and Installing POSTMAN
13. Creating **Workspace** In POSTMAN
14. Requirement to test REST API
15. Creating a **Collection** in POSTMAN Tool
16. How to **Add a New Request** under Collection
17. How We can **Run the Request**
18. Client Server Scenario

According to User we open the Browser input the URL and accordingly we will get some Responce.

Once we provided the url, it is sent to the server and on that basis server will share some response in the form of data which is available in server

For e.g : Open Chrome and type Google.com and google page is loaded

Server will send the response in different way :

Like : in XML , JSON and depends upon request type : Right Click on the page and Click on View page source : that is the Response but end user cannot understand it : But this particular response is interpreted by Browser ( Chrome , Safari , IE )

And Browers will interpret this and present them in user understandable way.

**Client** : Client is nothing but a small machine Which can initiate the request ( it can be computer or laptop which Contains some browser so that we can pass the request to the server.

**Server :** It is a storage area ( can be a physical Computer which contains actual data. For E.g : Suppose I am browsing on the **amazon website** so all the pages are **stored in the server**, or If we are clicking on a product it will send the request to the server and corresponding information will be fetched in the server and **response will come on the UI.**

**Servers are Remotely Available or on some other device.**

1. Client Server architecture
2. **1 Tier Architecture :**

* It means we have an application which only has 2 layers. For E.g :

Microsoft word, excel or notepad.

* To use these we don’t need internet, if I create a small file and some data and save it, it will be saved in the file system.
* Here we have Client component and File Server( Harddisk to save the Files )
* Everything is included in one component .

1. **2 Tier Architecture :**

* Here application contains 2 layers and is client another is database layer.
* We have a Client machine and another is Database Server.
* So Client will be there in one system and DB will be There in another system.
* Multiple Clients can be connected to same database server and can perform operations.
* We just need LAN connection, like in Banks, all their computer will be connected to one Server.
* All the Transactions happen in the local server and in EOD they will push all the data to main server ( There Internet Is Needed )

1. **3 Tier Architecture :**

* When web applications came into market three tier architecture took place.
* In 3 Tier have :
* Client Tier : Which is Browser ( We can have n no of Browsers N number of Clients.
* Database server : Here actual data will be Stored – Webpages
* In bw Client and DB server we have another layer called --- **Business Logic Layer**
* Client Layer : Presentation Layer
* So from the Client layer we are sending the Request.
* As soon as we send the request Through Browser Corresponding business logic will be executed.
* **Business Logic Layer : Contains Logic in Form of Programs**
* **So depending upon the type of Request the Corresponding logic will be Triggred and that will pass the request to the server , process the data, and again the Business logic will provide response to the Client**
* **API TESTING DEPENDS ON BUSINESS LOGIC LAYER.**
* **Every web app follow the Same, it has Client, Business Logic Layer and Database Layer**
* **Business Logic Layer : ALSO CALLED APPLICATION LAYER OR APPLICATION SERVER.**

1. Every Web app Has 3 Layer.
2. **Presentation Layer : It is Client, user has access of Presentation layer, and as soon as you are working with Application you in are presentation layer.**

* **We use Scripting Languages to create this : HTML , Javascript , CSS**

1. **Application Layer ( Business Layer ) : It is Middle Layer which contains Business Logic.**

* **We use Programming languages to Implement it : Java, .NET , C# , Python, C++**

1. **Data Layer : it is Data server where web pages or data will be shared.**

**To Develop Data layer : We use Different types of Databases like : MySql, Oracle, MongoDB**

**To design these types of architecture we use different types of Technologies.**

**Database Layer**

Testing of Database layer is called

Database Testing.

Like Connection of Tables

Checking Tables Size

How Many Coloum we Have, or Rows Insertion, Deletion

**Business Logic Layer**

Testing of Business logic Layer is

**Called API Testing.**

**Presentation Layer :**

Testing of Presentation layer is **Called GUI Testing or UI Testing .**

. Like Opening URL

. Testing Checkbox, Button

. We can also automate it by **using Automation Tool :**

**Selenium**

PPre

What is API Testing :

1. Presentation layer is just presenting the data.
2. IF I send request directly to the Business logic layer and this Layer will process the request to Server and get the Response and we can check the Response
3. So if I Conduct Testing on Business Logic Layer Directly without using any UI is Called – API Testing or Webservice.
4. Business Logic Contains N number of Programs , all these programs collectively we can call them as API.
5. So if I take one single API it can have Multiple Programs which will take some input and perform some tasks or Provide some output .
6. Here input is Called as Request and output is Called as Response.

Testing Percentage.

1. Before Developing the UI Layer API is Developed so as soon as API is developed we can start testing it ( API Testing ).
2. Almost 80 to 90 Percent of Testing is conducted on the API and the UI side we just need to do 10 to 20 percent of Testing, Like Checking Webelements etc.
3. Actual testing is done on Business Logic Layer as response to UI is coming from here only.
4. To Go for any Testing Interview One Should Know : 1. One Tool for Presentation Layer ( Selenium )  
    2. One Tool for Business Layer ( POSTMAN )  
    3. One Database for Database Layer ( SQL Server , Oracle )
5. API :

Stands for Application Programming Interface

1. The Business Layers is assisting between Pre and DB layer, So it behaves as an **application** which contains number of **Programs** acting as an **interface** bw Presentation layer and Database Layer.

2. Enables communication and Data Exchange bw 2 Software Systems ( Client and Server ).

5. API Testing **:**

1. It is Entirely different from GUI Testing and mainly concentrates on the business logic layer of the software.
2. The Testing won’t concentrate on the Look and feel of the application.
3. **We use Software to Send calls to API get output and note down the system Response**
4. API Testing Requires an application to interact with API
5. In order to TEST API we need :
6. Testing Tool To drive API
7. Write down the Code to Test the API

6. What Is Webservices ?

1. **All web service are API, but all API are not Web service**. There is not much difference in both

2. As Business contains the API, if those API are available through the internet they are called webservice.

3. **When I put API service in the Network is called WEBSERVICE.**

4. Whenever Developers send us API we test them in Local environment without having internet.

5. At that time we are calling them API, but once we work on Production server there same API will be available on the web, that time they will be called WEBSERVICE.

6. Defination : Services available over the web called webservice

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1. . Difference bw API and Webservice

# Web service is an API wrapped in HTTP.

**All web service are API, but all API are not Web service**

**Web Service might not perform all the operation that an API would perform.**

**A Web Service needs a network, while an API doesn’t need a network for its operation.**

8 .Types of Web Services

1. **There are 2 types of web services.**
2. **SOAP web Services : ( Simple Object Access Protocol )**
3. **RESTFUL Web Services : ( Representational State Transfer )**

* **Among these two SOAP is very old technology and it is very complex and it will only support XML format ( Send Request in XML get Response in XML.**
* **SOAP Sends Only POST Request.**
* **RESTful web Service : It is Latest technology, currently used by companies**
* **It supports multiple formats : HTML format , XML format , JSON format , Text Format.**
* **WE can send different types of Request in RESTful service like : Post Request , Get Request , Put Request**

9 . Types of Request

We do 4 Types of Requests, these are exactly related to database operations.

When we are working with database we do insertion , Updation, Deletion , Selection. Types of Request are :

1. **GET** ( Selecting Data from Server )

2. **POST** ( Create a New Record in the Database )

3. **PUT** ( It is Updation in the data )

4. **DELETE** ( Delete Request )

* All these 4 Request are Tested in API testing
* IN SOAP service only POST is Used
* In REST service all requests is supported.

**In PostMan tool both Webservices : SOAP and Rest are supported**

10 .Downloading And Install Postman

1. Go to Google and Write Download Postman : https://www.postman.com/downloads/
2. It is very very popular tool in the market
3. Most of the people are using it
4. It is an open Source tool
5. It is only for API testing
6. Supports all types of OS : MAC / Linux
   1. 2 Click on Download 64 bit
7. once it is downloaded it is ask for login : Multiple Ways

In Postman whatever tasks we are performing in will be stored in the network, it will create Workspace with Gmail account.

11. Create a New Workspace

1. now we will see how we can send the Request and validate the Response for that we have some of the API list

To Test **REST API we need :**

**a) Endpoints : URLs**

**b) HTTP Method Type : What type of Request need to Send**

c) **Body** = To send POST request we need to the send the body also

for Eg : if in database we want to create new record we need to have some data, similarly for POST request we need to Pass some data along With REQUEST. And for Every Request we will get some Response

d) **Response :** We need to validate the Response. It Can be Success Response or Failure Response

**if It is Failure Responce** : we might get some message like : Error Missing Password

12 .TYPES OF RESPONSE we GET

if the Response is PASS : We can get Status code : which is 200

and based on the Status code we can decide : the Request is Successful or not

* IF status is Coming : 200 or 201 : API Request is Successful
* If Status is coming like : 301 , Page not Found , Interuppted : So in these cases the request is not Properly processed : We need to Test them

1. once you get req from the developer, Based on the Req we need to Prepare the Document like this

Task to Perform in POSTMAN TOOL

13. Create a New Collection :

**Collections Contains multiple requests, Every Request is Considered as one Test Case**

First it is asking for Collection Name : DemoRestAPI

Now it is Created but it is Empty

URL : <https://reqres.in/api/users?page=2>

Part 1 : <https://reqres.in> -🡪 This is Called Domain

Part 2 : /api/users -🡪 Path Parameters

Part 3 : page=2 -🡪 Query Parameter

All together they are Called : URL ---- Uniform Resource Locator

* We Can Send Request from the Browser itself by Pasting url there and we will get response too, here response is coming in JSON format as it coming in curly Braces { }, but we cannot perform operations over there.
* Now go to Postman Tool

14 . SENDING First Request

* Under this Collection Module we have Created One Collection : Name – Demo Rest API
* WE need to make One Request Over here : Click on New Request button associated with Collection name
* A pop up window will get opened and a drop down is there that contains different types of request – Get post etc etc
* In Enter Request URL Text area Paste the URL : <https://reqres.in/api/users?page=2>
* And then click on Send Button
* And below we get The Response Body 😊
* In the Response Body we will see the Data along with some cookies and Along Some Headers
* WE have to validate all these things
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**VALIDATING THE RESPONCE**

1. SO first we need to Validate the DATA and there are different methods for it
2. After that we will Validate Headers
3. After that we can Validate : Status Code , Time , how much data we are getting
4. And now we can save it, by clicking at Save button
5. We can also run the request through Runner : Button Coming on TOP left but not in my Postman ☹
6. If We have Multiple Request we use this one
7. There is an Option to RUN IN COMMAND LINE – Click it
8. For this we need to install : npm install –g newman
9. Go to Command Prompt and we need to copy it and once it is installed we can Run The Requests through Command Line

Basic Information

How to Add a New Collection

<https://www.youtube.com/watch?v=95NBave0W_k&list=RDCMUC46vj6mN-6kZm5RYWWqebsg&start_radio=1&rv=95NBave0W_k&t=1414>