API TESTING:-

Date:- 21-06-2022

Introduction to API/Web Services

Client:

Client receiving the information.

Client is like a host.

Server:

Server providing the information.

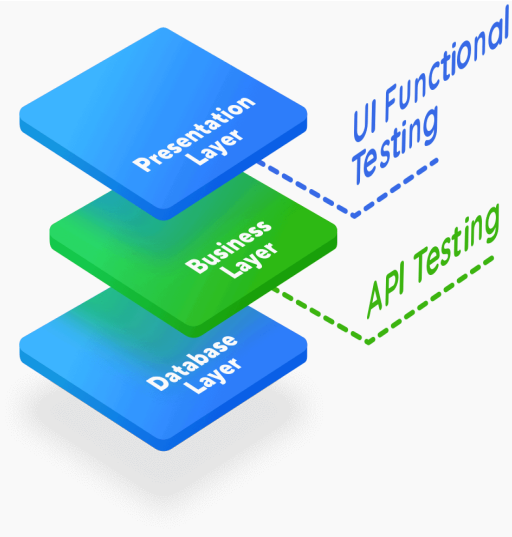
ex : file server, database server, web server etc....

What is an API :

API is an Application programming interface.

API behaves like a communication and data exchange between two software systems .

API is the middle layer between the presentation (UI) and the database layer.



What is an API Testing:

API testing is software testing that tests the APIS directly.

We can do functionality,reliability,performance, and security.

A→ It is part of application layer

P→ Implemented by programming language

I→ It acts as an interface between the server and client.

Web service:-

Web services are a type of API, which must be accessed through a network connection.

Web services available over the web.

Types of web services:-

We have two types of web services they are

1. SOAP (simple object access protocol)
2. Restful (Representational state transfer)

SOAP:- (simple object access protocol)

Soap is an older technology.

It will support only XML format only.

It will support only POST http requests only.

RESTFUL:- (Representational state transfer)

Restful is also called REST.

It is the latest one which is used mostly now a days

It will support multiple formats like XML, JSON,HTML, TEXT etc…

It will support all HTTPS requests (GET,PUT,POST,DELETE).

Requests in API:- (HTTP Requests)

We have API requests like

GET (Selection)

POST (Creation)

PUT (Updation)

DELETE (Deletion)

Differences between the web services and API:-

Web Services	**Web API**
It provides support only for the HTTP protocol.	It provides support for the HTTP/s protocol: URL Request/Response Headers, and so on.
All Web services are APIs.	All APIs are not web services.
Web services are a type of API, which must be accessed through a network connection.	APIs are one application that can communicate with another application in a standardized manner.

Web service supports only XML.	API supports XML and JSON etc...

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Http Requests:-

GET (Selection)

POST (Creation) (when we pass post request we need to pass Request body/Requests Payload)

PUT (Updation) (when we pass put request we need to pass Request body/Requests Payload)

DELETE (Deletion)

Postman :-

Postman is a testing tool.

Postman is an application used for API testing.

Methods:-

GET: retrieve information

Post: create information

Put : update information

Delete: Delete information

Response Codes:-

When testing APIs with Postman, we usually obtain different response codes. Some of the most common include:

- 100 Series > Temporal responses, for example, '102 Processing'.
- 200 Series > Responses where the client accepts the request and the server processes it successfully, for instance, '200 Ok'.
- 300 Series > Responses related to URL redirection, for example, '301 Moved Permanently.'
- 400 Series > Client error responses, for instance, '400 Bad Request'.
- 500 Series > Server error responses, for example, '500 Internal Se**rver Error.'**

What is Smoke Testing in Real time?
Testing the Critical or basic Feature is called smoke testing.
It is a part of acceptance testing.
We use +ve test cases only.
Here the build is stable only when we do father testing.
It is documented.

What is Sanity Testing in Real time?
Testing the functionality and bug fixes areas.
It is a part of regression testing.
We use +ve & -ve test cases.
Onces the build is stable only when we do sanity testing.
We don't require documentation.

What is the severity in real time?
Impact on the application or businesses.
Types - Blocker,Critical,Major,Minor.

What is the priority in real time?
Importance given to fix the bug.
Types - P0,P1,P2.

What is a Test case?
It is a document which covers all the possible scenarios for a specific requirement.
It has steps like step no, description , input, output, etc…

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What is the difference b/w Unit testing and API testing:-

Unit Testing	API Testing
1.Developer perform it	Testers perform it
2.Separate functionality is tested	End to end functionality is tested
3.Developer can access the source code	Tester can't access the sources code
4.UI testing is also involved	only API testing is involved

Components of Web Services:-
This supports only the SOAP Web Services.
Web services have two components they are
WSDL:- web services description language.

Where the data is located in such a case we go to WSDL.
UDDI:- universal description, discovery and integration.
Here the no of WSDL is there in UDDI.

HTTP AND HTTPS:-

HTTP :- Hypertext transfer protocol.
HTTP allows the communication b/w different software systems.

In HTTP here the data is not encrypted. It is not secured.

HTTPS :- Hypertext transfer protocol security.

HTTPS create a secure encrypted connection between the server and the browser.
Here SSL(secure sockets layer) is used for security.

EXAMPLE for API TESTING:-

API
Service provider
server

API

Make my trip
Service consumer
client

This is the example for web API testing (Here internet plays the role).

Authentication
It verifies who the user is

Authorization
It determines what resources a user can access

EX:-

Airport -------> Without an ID card not allowed this is as known as authentication.
----------> after entering into the airport we need to get into the flight we should have a boarding pass known as authorization.

Request Method:-

1.GET:-
The GET method is used to retrieve information from the given server using a given URI. Requests using GET should only retrieve data.
2.POST:-
A POST request is used to send data to the server, for example, customer information, file upload, etc. using HTML forms.
3.PUT:-
Replaces all the current representations of the target resource with the uploaded content. (ex:- In API my data is there its total data changes).
4.PATCH:-
Replace only the current representations of the target resource with the uploaded content. (ex:- In API my data is there it only changes some part of my data.)
5.DELETE:-
Removes all the current representations of the target resource given by URI.
(ex:- In API my data will be deleted.)

HTTP - Responses:-

-->Body:-
Body will get it when we get a response at that time we get the body .

-->Headers:-
These header fields give information about the server and about further access to the resource identified by the Request-URI.

-->Status Code**:-**
The Status-Code element is a 3-digit integer where the first digit of the Status-Code defines the class of response and the last two digits do not have any categorization role.

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HTTP - Status Codes:-

---->100: Informational

------>200:- Success

1. **200 :- (200 OK)**
   The request is OK.
2. **201 :- Created.**
   The Request is complete, and a new resource is created.
3. **202:- Accepted.**
   The request is accepted for processing, but the processing is not complete.

---->300: Redirection

------>400:- Client Error.

1.400 Bad Request:-
The server did not understand the request.

2.403 Forbidden:-
Access is forbidden to the request page.

3.404 Not Found:-
The server can not find the request page.

------>500-: Server Error.

1.500 Internal Server Error:-
The request was not completed. The server met an unexpected condition.

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Postman Scripting:-

Here we have two type of scripting

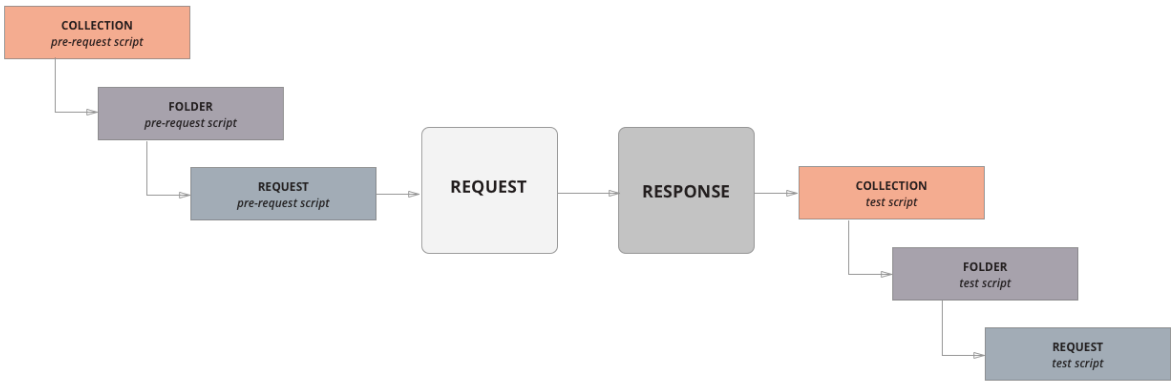
Pre-Request script ----> Request -----> Responses -----> Test script.

This is the flow of scripting.

Here 3 levels we can give script

1.Collection.
2.Floders.

3.Requests.



This is the flow of API scripting.

Date:- 30-06-2022

What is an Access Token?

When we need to use an application to access an API.

So Access Token can be given to access an API.

This are the

- to access a particular service or services.
- on behalf of a particular user (optional).
- for a particular institution.

What is the Request Body and Response Body?

Request Body:-

A request body is data sent by the client to your API.

When we want to change the data in the API we can use the Request Body.

Every Time we don't send the data or change the data.

Response body:-

A response body is the data your API sends to the client.

Your API almost always has to send a response body.

Whenever we get a response, we almost always get the response body.

What is JSON?

JSON stands for JavaScript Object Notation.

JSON is text format for storing and transporting the data.

We can understand easily.

What are API Parameters?

Parameter is used to determine the type of action performed on the resources.

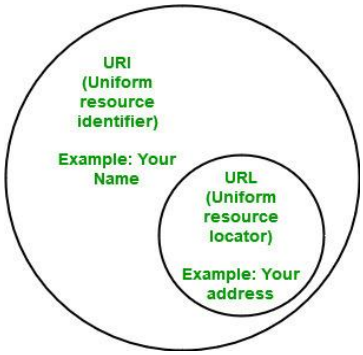
https://airline.server.test/ticketing_api/{flight_id}/{passenger_id}?option=wheelchair &option=vegetarian

https://airline.server.test/ticketing_api/ = Up to here it is called domain.

{flight_id}/{passenger_id} = We should place the path in Setoff { } curly braces is called Path Parameter.
To which resource we need to perform an action that is called path parameter.
:pathid
?option=wheelchair &option=vegetarian = After the (?) question mark Whatever path is there that is called as query parameter.

URL= Uniform Resource Locator.
URL is used to locate the resource on the internet.

URI= Uniform Resources Identifiers.
URI is used to identify the characters of the resources on the internet.



WEB APPLICATION TESTING:-

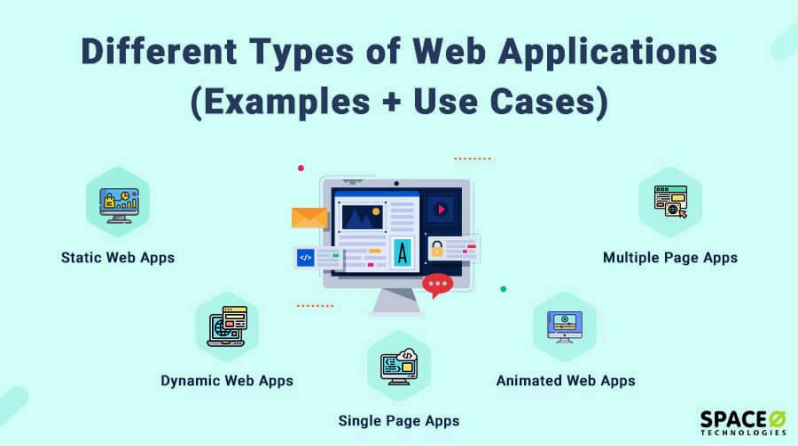
Date:- 27-06-2022

Web Applications:-

What is a web application?

Web App that runs on the browsers or web .
In web apps mostly we can see the scripting programming language (html, css, php etc..).

There are 9 different types of web applications:-



1.Static Web Apps:-

The static web app directly delivers the content to the end user's browser without fetching any data from the server.

Most static web apps are known to be simple and effortless to develop across the web.

Ex:-

2.Dynamic Web Apps:-

A web application that generates the data in real-time based on the user's request and server response, is known as a dynamic web application.

Ex:- Netflix, facebook etc..

3.Single Page Apps:-

A single-page application runs entirely within a browser and doesn't require page reloading.

Ex:-Gmail, paypal etc..

4.Multiple Page Apps:-

A web app that includes multiple pages and reloads the whole page whenever a user navigates to a different page is known as multiple page apps.

Ex:- google doc etc..

5.Animated Web Apps:-

A web application that supports animation and synchronization on the web platform is known as an animated web app.

Ex:- Game of the year, Species in pieces etc..

6.Content Management Systems:-

A software program that helps users manage digital content, improve the production and management of content is known as CMS (Content Management System).

Ex:- Wordpress, Durpal etc..

7.E-commerce Web Apps:-

A web application that helps users electronically buy or sell goods over the internet is called an e-commerce web app.

Ex:- Amazon, Walmart etc…

8.Portal Apps:-

A portal web app is a type of web and brings out the details from different sources like emails, online forums, and search engines in a uniform way.

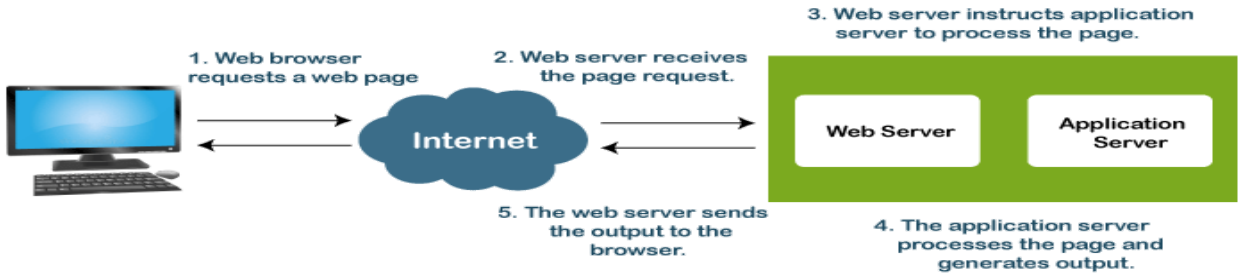
Ex:- Udemy, Crouses etc..

9.Progressive Web Apps:-

Progressive web apps are known as cross-platform web applications which use the latest browser APIs (Application Programming Interface), features etc..

Ex:- BMW, Spotify etc..

The Flow of the Web Application:-



In general, a user sends a request to the web-server using web browsers such as **Google Chrome, Microsoft Edge, Firefox**, etc over the **internet**.

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Web Application Testing Techniques:-

—>Functionality testing:

This step ensures that the functionalities of a web application are properly functioning or not. Functional testing takes place in the source code.

—>Usability testing:

Testing the user friendliness of an application is called usability testing.
If the application takes less time or effort to learn that means the application is user friendly.

—> Interface testing:

Interface Testing is defined as a software testing type which verifies whether the communication between two different software systems is done correctly.
A connection that integrates two components is called interface.

—>Compatibility testing:

Compatibility Testing is a type of Software testing to check whether your software is capable of running on different hardware, operating systems, applications, network environments or Mobile devices.

Compatibility Testing is a type of Non-functional testing.

—>Performance testing:

Performance Testing is a software testing process used for testing the speed, response time, stability, reliability, scalability and resource usage of a software application under particular workload.

1.Load testing:-

Testing the stability, response time of an application by applying load which is (=<) equal to or less than designed by the number of the users is called load testing.

2.Stress testing:-

Testing the stability, response time of an application by applying load which is (>) greater than designed by the number of the users is called Stress testing.

3.Volume testing:-

Testing the stability, response time of an application by transferring a huge volume of data through it.

4.Scalability testing:- The objective of scalability testing is to determine the software application's effectiveness in "scaling up" to support an increase in user load. It helps plan capacity additions to your software system.

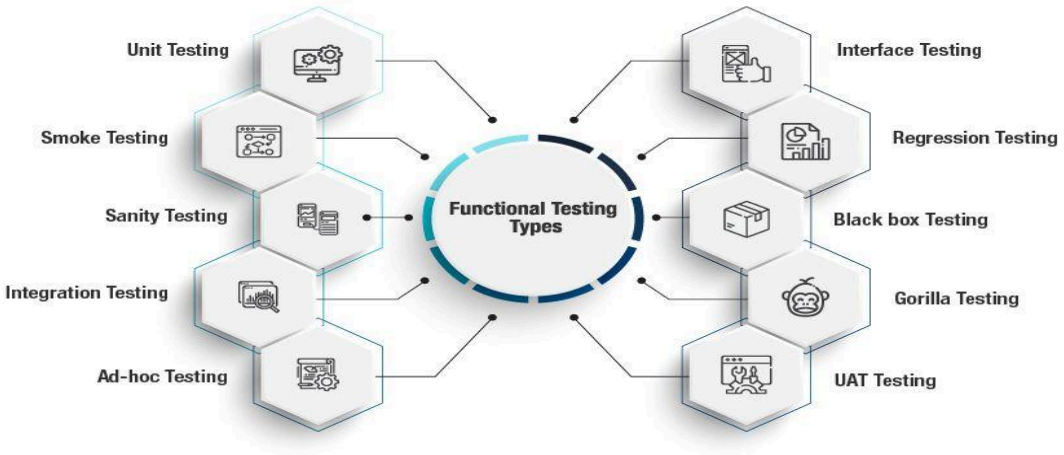
5.Soak testing:-

Testing the stability, response time of an application by applying load continuously for a particular period of time is called soak testing.

—>Security testing:

Security testing is testing the Security of an application in that way from customer's data, application security and cyber attacks.

What are the Important Functional Testing types?



These are the functional Testing types.

What are the Important Non-functional Software Testing Types?

These are the non- functional Testing types.

Functional Testing	Non-functional Testing
It is performed before the non fun testing	It is performed after functional testing
Helps to validate the behavior of the app.	Helps to validate performance of apps.
It is based on customer's req.	It focuses on customer's expectation.
Examples of Functional Testing Types ● Unit testing ● Smoke testing ● User Acceptance ● Integration Testing ● Regression testing	Examples of Non-functional Testing Types ● Performance Testing ● Volume Testing ● Scalability ● Usability Testing ● Load Testing

—>What is the Requirement Traceability Matrix? (RTM)

Traceability Matrix is a document prepared to ensure that every requirement has at least one test case.

Types of Traceability Test Matrix:-

Forward traceability matrix:-

If you are mapping a root document to a derived document that is called forward traceability matrix.

Backward traceability matrix:-

If you are mapping a derived document to a root document that is called backward traceability matrix.

—>Test Cases Design Techniques:-

It helps you to design better test cases.

We have different techniques they are,

Boundary Value Analysis (BVA):-

Boundary value analysis is based on testing at the boundaries between partitions. It includes maximum, minimum, inside or outside boundaries, typical values and error values.

Ex:-

Input condition is valid between 1 to 10

Boundary values 0,1,2 and 9,10,11

Ex:-Suppose, a printer has to make and deliver printed copies ranging from 1 to 150. So, to apply boundary value testing, the analysis is done on the boundaries, taking the extreme ends. The maximum value is 150 and the minimum value is 1. The invalid values in this test case will be 0 and 151.

Equivalence Partitioning:-

Equivalent Class Partitioning allows you to divide a set of test conditions into a partition which should be considered the same.

Ex:-

Input conditions are valid between

1 to 10 and 20 to 30

Hence there are five equivalence classes

--- to 0 (invalid)

1 to 10 (valid)

11 to 19 (invalid)

20 to 30 (valid)

31 to --- (invalid)

Error Guessing:-

Guess the possible errors and defects and derive the scenarios based on that we guess errors based on experience and interaction.

MOBILE APPLICATION TESTING:-

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What is Mobile Application Testing:-

Mobile Application Testing is a procedure to test the Mobile Applications for Usability, functional, and consistency glitches.

Mobile application testing is very different from Software Testing and Web Testing.

What are Mobile application testing essentials?

There are a few specifics that you should consider before performing mobile application testing:

----> Screen resolution
----> Turning on/off GPS
----> Screen orientation (landscape, portrait)
----> Different devices manufacturers
----> OSs
----> Type of mobile application.

Types of Mobile Application:-

---->**Mobile web applications**:- These are the web pages that you open through the mobile browser.
Ex:- Google docs, Netflix etc..
--->Native Apps: These are the applications that are developed for one particular platform. (iOS, Android, Windows 10 M0bile, Tizen, BlackBerry).
Ex:- Whatsapp, spotify etc..
---->**Hybrid**: It is a Combination of mobile web app and Native App.
EX:- Gmail, Twitter etc...

Build Types:-

Android (apk):-
we can download from play store (or) 3rd party (or) by sharing app links.
It is open source.
IOS (app,ipa):-
This we don't get publicly. We can get it from the app store.
It is Restricted.

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Stages of Mobile application testing:-

There are different types of techniques for mobile application testing.

—>**Documentation Testing:-**

The beginning of mobile testing takes place from the Documentation testing preparatory stage.

Documentation phase marks the creation and analysis of requirements (Specification, PRD), Test Cases, Test Plan, Traceability Matrix.

—>Functional testing:-

It helps you test whether your mobile application works as expected and in accordance with the requirement specifications.

—>Usability Testing:-

Usability Testing ensures that your application offers convenient browsing to your customers.

It checks the friendliness of an application.

—>UI (User Interface) testing:-

User Interface (UI) testing ensures that your application's UI meets all the required specifications.

It focuses on the look and feel of an application.

—>Compatibility (Configuration) testing:-

Compatibility (Configuration) testing validates the performance of your application on different devices based on their size, screen resolution, version, hardware, etc.

—>Network configuration testing:-

Testing your mobile application compatibility in different network configurations and standards (2G, 3G, 4G).

—>Performance testing:-

Performance Testing helps you test your application reaction and constancy under a specific workload.

Performance testing attributes

- **Load Testing:-** It is done to check the application's behavior under normal and extreme loads.
- **Stress Testing:-** It is done to test the application's ability to sustain stress. It ensures that your application is capable of bearing undue stress.
- **Stability Testing:-** It tests if your application can work well for a longer period within normal loads.
- **Volume Testing:-** It is conducted to test your application's performance when subjected to a huge volume of data.
- **Concurrency testing**:- It tests the performance of your application when multiple users are logged in.

—>Security testing:-

Security Testing validates the security features of your application.

—>Recovery testing:-

Recovery Testing tests the ability of your application to withstand and successfully recover from possible and potential failures.

—>Beta testing:-

Beta testing is done by real users on real devices to validate usability, functionality, compatibility, and reliability testing.

—>Certification testing:-

Certification testing tests whether your application meets the standards, licensing agreements, terms of use and requirements of stores like the App Store, Google Play, and Windows Phone.