Rest Webservices automation-part1

What is API?

Application Programming Interface.

API Testing is also known as **Back-end testing**

Selenium/Qtp based testing – also known **as front end testing.**

Certain companies don’t have any UI,they give some backend application APIs to test .

API s are

1.nothing but jar files ….e.g.selenium jar file is also an API.

2.It can have many classes,interfaces combined together in a jar

3.we are accessing the methods that are written in API classes using our test cases

@Test

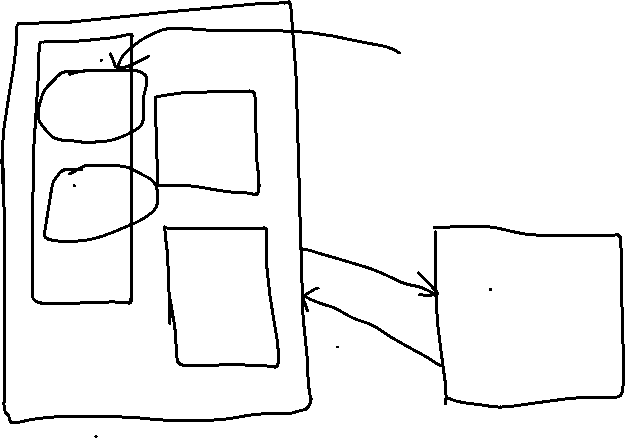
Sum(inta,intb) Interface public void operation()

{ } {int a=10;

Int b=20}

Diff()

{ } class 2 System2



JSON/ System 1

XML

Class operation

Calculator.jar/API

Consider.

S1 is a system written in java and S2 is written in dotnet.and how to access dotnet code.

It can be done by calling their APIs

Why JSON/XMl?

Data collector

Any type of data can be stored in json /xml format

Light weight 🡪jason format

Used when two systems are interacting with each other.

These two systems can be totally independent either technology wise or business wise.

If a system has to interact,they can send Request API in the form of

Request JSON payload

And in turn we receive Response JSON payload.

\*\*Selenium works with same concept.It sends info to the browser in the form of APIs.

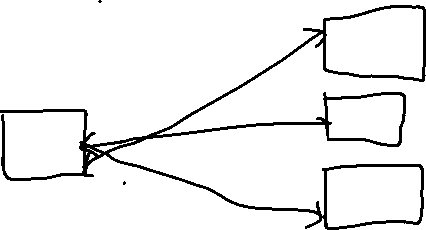
It sends request JSON Payload to google(e.g.To click some button,Click API will be called).

1.If S1 has to access S2,then S2 will give a Authentication key to S1.For.eg.ABC company will sell their product to diff clients lik Walmart,amazon etc.each of these companies will have authentication key/Token Key.It is always unique.(authentication key for amazon is different from Walmart).

Request JSON Payload Walmart

Authentication key/Token key

(unique) amazon



S1

Response JSON Payload JP Morgan

Who will decide either XML based API or JSON based API?

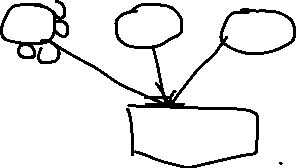
S1 or ABC company will decide.Mostly it will be JSON call.

Webservices:

Take an example of flight booking site.

Indigo spicejet airIndia

APIS



Bookmytrip

1.Here.Bookmy trip provides UI to book the flight and when we select all our booking details,at the back end,it will convert the info in JSON format and send Request JSON Payload to other vendors(Indigo,SpiceJET) and bookmytrio receive Response JSON Payload from Spice jet and then UI developers convert the JSON and display the info in the UI to the customer.

2.Vendors lik spiceJet,Indigo does not want Bookmytrip to access their database or their private information.So what they do is,they create API s for these vendors and these vendors can call them .

Request JSON Payload



{

“From” : ”Bangalore”,

“To” : “Chennai”,

“From Date”: “31-dec-2019”,

“To date”: “01-jan-2019”,

“No.of.Passengers” : “1”

}

Response JSON

{

“Price “ :”5000INR”,

“Time” : “6.00 pm”

}

Webservices:

Here,we are calling the APIs using HTTP protocol over the network.So,these type of APIs are called as Webservices.

Request Payload---------------------🡪Response payload

HTTP Protocol/Network

< ---------------------------

Important factors in webservices:

1.Authentication:

In the form of Session/Token key.

2.Usename/Password: Sometimes username/pwd also shd be based depending on the companies.

3. Kind of request:

Either JSOn/XML

4.Method type:

HTTP Method-CRUD operation(Create,Retrieve,upadate,delete)

Bookmytrip cannot update/delete in Indigo APIS,It can only retrieve information.

i.e.only **GET** calls.

5.Security:

RestAPIs also provide security.

RestAPIs:

If you are passing JSON/XML format,then these types of calls are known as REST APIs.

we are calling jar files/APIs that are available locally in the machine.i.e.selenium jars,Apache POI API.etc.

Same thing,if it happens via HTTP Protocol over the network ,then that is happening thru webservices.

Summary:

APIs: methods that are given to us in the form of jar files.e.gs.Selenium,Log4j API.

Webservices: if these APIs are called over the network via HTTP protocol,then they become webservices.

Two types of webservices are available:

1.Rest webservices: Representational state transfer .

2.SOAP based webservices: simple Object access protocol.

Diff between SOAP and Rest

SOAP Rest

It is a protocol It is a architectural style

Stands for Simple Object access Protocol stands for Respresentaional state Transfer

Cant use REST because it is a protocol can use SOAP

\*\*Uses **services interface** to expose the uses **URI** to expose business logic.

business logic

\*\***JAX-WS** is the JAVA API for **SOAP JAX\_RS** is the java API for REST

Requires more bandwidth Less bandwidth compared to SOAP

Defines its own security inherits security from the underlying layers

Thru network layer

\*\*Permits **oly XML data format** only Permits different data formats such as

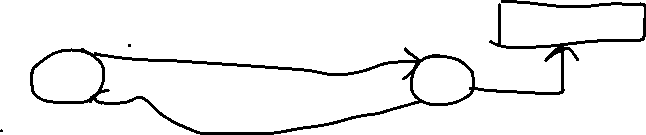
**plain text,HTML,XML,JSON etc.**

Less preferred,not used now a days more preferred.

Rest API design-Webservices Part II

What is Rest client? Database-Oracle db

HTTP Request Account table



S1 -client/consumer S2-Server/Producer

E.g. HTTP Response

S1 is a client system.

S2 is a machine or VM or any cloud machine/server which is hosted somewhere and available over the network.

4 different operations can be done in S2 .

CRUD

1.Create – POST call

POST call is used to **create new entity** .

e.g. new account,we have to use POST call.

What shd we pass in POST call?

1.JSON payload with details like account name,account number,address etc.

e.g..”account\_id”=”1”,

“ account\_name”=”jansi”,

“ address”=”Toronto”



This account with all these details will be created in database.Server will be connected to db to fetch the info.

2.Headers.

3.URI

2.Retrieve – GET call

GET call is used **to retrieve /fetch an entity**

We don’t pass any JSON Payload in GET call.

**What do we pass in GET call?**

1.URI

It is the combination of URL + Path parameter+ Query parameter.

🡪 e.g. hhtp://api.com/service/account/1

api.com---🡪 server /host name ..in this e.g.S2 server

account🡪 in this S2 server 🡪service folder🡪account class🡪1 method🡪get info abt account\_id=1

2.Path parameter

3.Query parameter

4.Headers

3.Update+Create – PUT call

It is a combination of POST call + UPDATE call.

i.e. we can either create a new entity or update an existing entity because PUT call internallu calls POST call only.

4.Delete - DELETE call

Delete an existing entity.

What is a HTTP Request?

What shd be passed in this request?

1.URI

2.Header

3.Payload ->POST call or PUT call 🡪It can be either JSON or XML format.

What is HTTP Response?

What exactly will we get in the response?

1.Status – if it is correct response🡪then we will get 200 OK response msg.

2.Response payload🡪JSON object

3.string message-successful or not successful

I.Status Response Code:

i) 200 🡪”OK”

APIs are working fine,

ii)201🡪”Created successfully” when we do a POST call(create a new entity)

iii)400🡪”Bad request”

when missing payload or missing an attribute in payload etc.

iv)404🡪”Not found”

When a particular entity is not available or we get in case of a broken link or a particular page is not found.

v)500🡪”Internal Error”

when server is down or when server is not responding properly or during a network issue.

vi)401🡪”Authentication”

when username or pwd is missing

**How to test these APIs?**

When we don’t have any UI or any web application ,**To test the APIs we need a Rest API client like**

1.Postman

2.SOAP UI tool (both SOAP and REST calls ) can be done using this tool.

3.Advance Rest Client

4.JMeter 🡪used for both performance testing and we can also call the APIs

5.through Browser also we can call APIs.

6.swagger🡪tool which can call APIs directly

But,if we need to call a proper POST or GET call,POSTMAN is very important tool

**How to download Postman?**

Google🡪download postman🡪chrome web store🡪add postman

Create an account

**Account details:**

**Email:jansilakshmanan90@gmail.com**

**Username: ThejaswiniRaj**

**Password:thejaswini03.**

**Dummy APIs available over the internet for practice:**

1. <https://reqres.in>
2. 2. <https://fakerestapi.azurewebsites.net/swagger/ui/index>

Swagger🡪tool for API technical documentation to list the different APIs available on the server.

In swagger,we can hit /test the API directly without using POSTMAN. but Pstman is powerful tool.

3. [http://services.groupkt.com](http://services.groupkt.com/)

https://reqres.in🡪End point URL

**end point URL+ Service API URL🡪URI**

for any API testing,

1.first we need to ask for end point URL to the developer.

**e.g.**

Open this API site🡪hit any GET call and this URL

For.e.g.here,I am hitting GET call of list users

o/p will be

Request /api/users?page=2 🡪this is the service API URL

Response 200

JSON code will be

{

"page": 2,

"per\_page": 3,

"total": 12,

"total\_pages": 4,

"data": [

{

"id": 4,

"first\_name": "Eve",

"last\_name": "Holt",

"avatar": "https://s3.amazonaws.com/uifaces/faces/twitter/marcoramires/128.jpg"

},

{

"id": 5,

"first\_name": "Charles",

"last\_name": "Morris",

"avatar": "https://s3.amazonaws.com/uifaces/faces/twitter/stephenmoon/128.jpg"

},

{

"id": 6,

"first\_name": "Tracey",

"last\_name": "Ramos",

"avatar": "https://s3.amazonaws.com/uifaces/faces/twitter/bigmancho/128.jpg"

}

]

}

2.Now open POSTMAN and hit the URI

Here,

end point URL🡪https://reqres.in

Service API URL for GET call🡪/api/users?page=2

URI 🡪end point URL +Service API URL

URI 🡪

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

what is ? in the Service API URL here,

question mark🡪is query parameter.

For.e.g. without ? ,if we hit the GET call,it will return all the users details.

But if we need to filter the users with name or id,then we have to include query parameter in it.

page=2 🡪page=parameter,2🡪parameter value.

It fetches all the user details where page=2

Hit send button to send the request,we will get the response body as a JSON object

Sections in Postman:

1.Request

2.Response section

e.g. for GET call:

/api/users/2🡪get info abt the user whose userid=2

/api/users/100🡪 get info abt the user whose userid=100

Since,this data is not available in the db,we ger 404”not found “error amd a blank JSON object

How to hit a POST call in POSTMAN?

Step1:Select Post call in Postman request section

Step 2:Get the Service API URL for POST call

Step3:Write the URI in the response section

Step4:click body🡪raw🡪create a new entity in Json body

{

"name" :"Jan";

"job":"tester"

}

Step5:send the request

JSON Response would be:

{

"id": "687",

"createdAt": "2019-05-02T15:38:16.987Z"

}

A new user with id=”687” is created

How to hit a Delete call?

Follow the above steps and select Delete instead of POST

JSON Response would be:

204 No Content , since entity is deleted.

Examples of Path parameter and query paramaeter

For.e.g.consider this API where we can info abt all the countries

only GET calls are allowed in this API…PUT,POST and DELETE are restricted

[http://services.groupkt.com](http://services.groupkt.com/)

1.Query parameter:

<http://services.groupkt.com/country/search?text=un>

It has question mark and it is used to filter information.

Here,it fetches all the coumtries where text contains”un”

2.Path parameter:

<http://services.groupkt.com/country/get/iso3code/IND>

It does not have question mark,instead it has a slash.It fetches only specific data.

Here,It fetches country with iso3code=”IND”