SOAP UI Tool & Features

SoapUI is an open-source web service testing application for Simple Object Access Protocol (SOAP) and representational state transfers (REST). With more than 9 million downloads SoapUI is the de-facto standard for REST and SOAP API functional, security and performance testing.

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OBJECTIVE

1)What is SOAP UI?

2)Purpose of SOAP UI.

3)Difference between SOAP UI tool and POSTMAN tool

4)SOAP UI interface walkthrough

5)SOAP UI tool installation in windows

6)More about REST APIs

7)Difference between SOAP and REST

8)How to do manual Testing for API using SOAP UI

9)How we can validate API response using automated script

10)How we can do end to end API testing using property transfer

11)Frequently asked questions regarding API testing

What is SOAP UI?

1)SoapUI is a tool for testing Web Services; these can be the SOAP Web Services as well RESTful Web Services or HTTP based services

2)SoapUI is an Open Source and completely free tool with a commercial companion -SoapUI Pro- that has extra functionality for companies with mission critical Web Services.

What Can I use SOAP UI For?

1)Soap UI can be used for complete Restful web services and Soap Webservices testing

2)Can do Functional Testing, Regression Testing, Performance Testing and much more.

Difference between SOAP UI and POSTMAN

- SoapUI and Postman are the two robust API testing featured tools that are used for testing and managing API. These help testers to create and share reports during API development. Though Postman and SoapUI are actively used by many businesses, these do have several positives and negatives.

- Both the tools are effectively popular, but in many cases, SoapUI is preferred by large enterprises, and Postman is preferred by mid-sized companies. This may be due to the affordability factor. Postman is available at a decent price and it even includes automation tools that help in saving time

- Postman and SoapUI are known for their API features, but there are even many features that make them different. Postman is easy for sharing reports and API data provides strong collaboration tools, almost works with many modern API data, and provides the feature of time-saving. Whereas, SoapUI is an easy interface allows drag and drop and point and click the option to set up. It is also good in tool integration, offers an easy way to reuse the test scripts. This tool is the best option when there are fewer professionals involved in API management.

Installing SOAP UI

SoapUI is cross-platform, and can be used on either Windows, Mac or Linux/Unix, according to your needs and preferences

Installing SOAP UI on Windows

1)Download the .exe file from https://www.soapui.org/downloads/soapui/.

2)After Double click on exe file, installer will start immediately

3)After installing the app in preferred location, run the shortcut file which get created on the desktop.

Soap UI Interface

- Soap – Using this Icon you can create project for SOAP API

- REST – Using this Icon you can create project for Rest API

- Import – If you have existing project to import

- Save All – Using this icon one can instantly save all the unsaved changes

- Forum – You can ask any query related to Soap UI directly on their forum

- Trail – This is trail product (soap ui pro) which provides you the additional shortcuts within the software. Which further makes your work less complex

- Preference – Using this icon you can set properties on global level and on project level
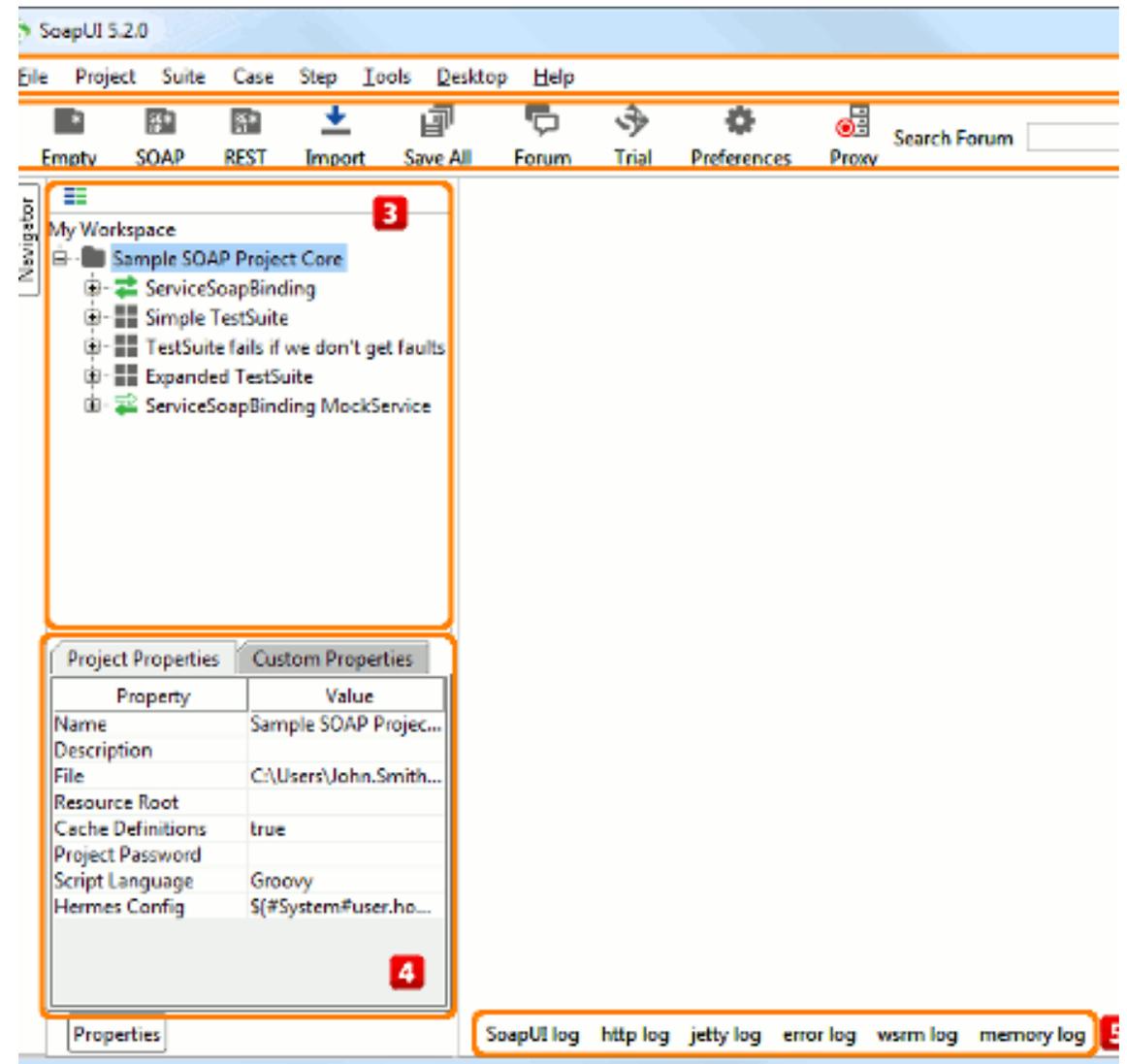
What is Rest API?

1)REST is an acronym for Representational State Transfer.
2) An API is an application programming interface that allow programs to talk to each other.
3) The developer creates the API on the server and allows the client to talk to it.
4) REST determines how the API looks like. It stands for "Representational State Transfer". It is a set of rules that developers follow when they create their API. One of these rules states that you should be able to get a piece of data (called a resource) when you link to a specific URL.
5) Each URL is called a request while the data sent back to you is called a response.
6) Rest API uses HTTP requests to GET, PUT, POST and DELETE data.
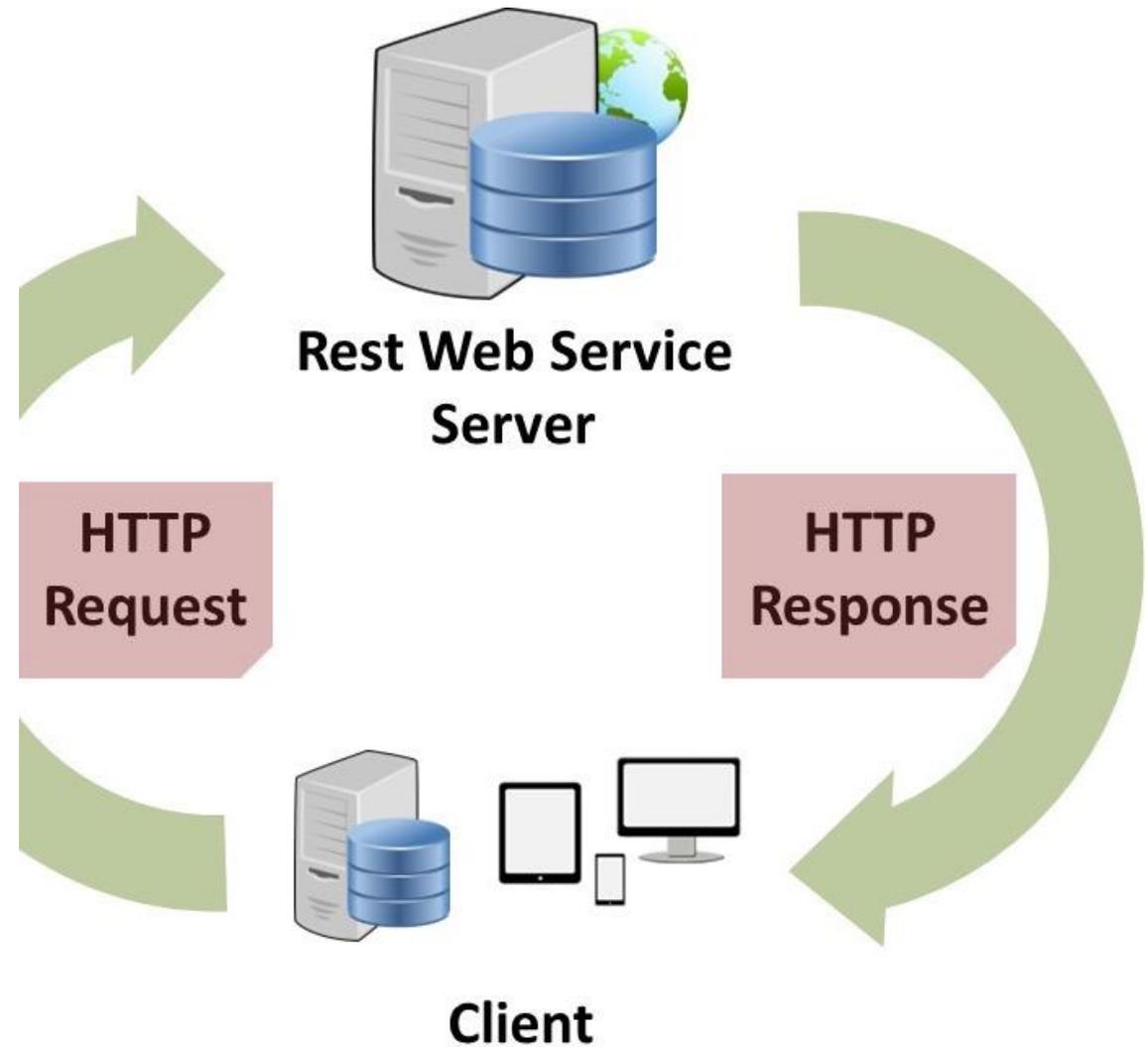
Difference Between Soap and Rest

Rest	Soap
REST stands for Representational State Transfer.	On other hand SOAP stands for Simple Object Access Protocol
REST API has no official standard at all because it is an architectural style.	SOAP API, on the other hand, has an official standard because it is a protocol
REST APIs uses multiple standards like HTTP, JSON, URL, and XML	SOAP APIs is largely based on HTTP and XML
As REST API deploys and uses multiple standards as stated above, so it takes fewer resources and bandwidth as compared to SOAP API.	On other hand Soap API requires more resource and bandwidth as it needs to convert the data in XML which increases its payload and results in the large sized file.

Let's start with Rest API Test using SOAP UI Tool

Sample Rest API - For Adding Employee	
POST API (URL)	http://dummy.restapiexample.com/api/v1/create
End Point	http://dummy.restapiexample.com/
Resource	api/v1/create
Data Set	{"name":"test","salary":"123","age":"23"}

Json Response	{
	  "status": "success",
	  "data": {
	    "name": "test",
	    "salary": "123",
	    "age": "23",
	    "id": 6073
	  },
	  "message": "Successfully! Record has been added."
	}

Sample Rest API - For Fetching Employee Detail	
GET API (URL)	http://dummy.restapiexample.com/api/v1/employee/1
End Point	http://dummy.restapiexample.com/
Resource	api/v1/employee/1
Data Set	NA

Json Response	{
	  "status": "success",
	  "data": {
	    "id": 1,
	    "employee_name": "Tiger Nixon",
	    "employee_salary": 320800,
	    "employee_age": 61,
	    "profile_image": ""
	  },
	  "message": "Successfully! Record has been fetched."
	}

Script Assertion Property

- Assertions are used to validate the Json response parameter

- We use pre defined classes and functions through groovy coding in order to achieve pass and fail condition

- Below mentioned is the script for validating employee name in JsonRes:

```
import groovy.json.JsonSlurper    // Importing json slurper class

def response=messageExchange.response.responseContent   // Grabbing response content

def jsonObject= new JsonSlurper().parseText(response)   // parsing response using JsonSlurper class

assert "Tiger Nixon"==jsonObject.data.employee_name   //validation using assert keyword
```

Another Rest API Test using SOAP UI Tool

Sample Rest API - For adding places on google server	
POST API (URL)	http://216.10.245.166/maps/api/place/add/json?key=qaclick123
End Point	http://216.10.245.166
Resource	/maps/api/place/add/json
Parameter	?key=qaclick123

Data Set	<pre>{
	   "location":{
	      "lat" : -38.383494,
	      "lng" : 33.427362
	   },
	   "accuracy":50,
	   "name":"Frontline house",
	   "phone_number":"(+91) 983 893 3937",
	   "address" : "29, side layout, cohen 09",
	   "types": ["shoe park","shop"],
	   "website" : "http://google.com",
	   "language" : "French-IN"
	}</pre>

Json Response	<pre>{
	   "status": "OK",
	   "place_id": "e0980bb4de9688a98c8d392ef7b9db91",
	   "scope": "APP",
	   "reference": "bff3d43b5a0e0484cfdb15f22c3c2518bff3d43b5a0e0484cfdb15f22c3c2518",
	   "id": "bff3d43b5a0e0484cfdb15f22c3c2518"
	}</pre>

Sample Rest API - For delete place on google server	
Delete API (URL)	http://216.10.245.166/maps/api/place/delete/json?key=qaclick123
End Point	http://216.10.245.166
Resource	/maps/api/place/delete/json
Parameter	?key=qaclick123

Data Set	<pre>{
	   "place_id":"8ee50e772d96871bca8c0415990c97da"
	}</pre>

Json Response	{"status": "OK"}

Property Transfer Using SOAP UI

- Proper Transfer is used to transfer value of "json response parameter" from one API into request data of another API

- Below mentioned is the screen from where we can transfer the properties between 2 APIs
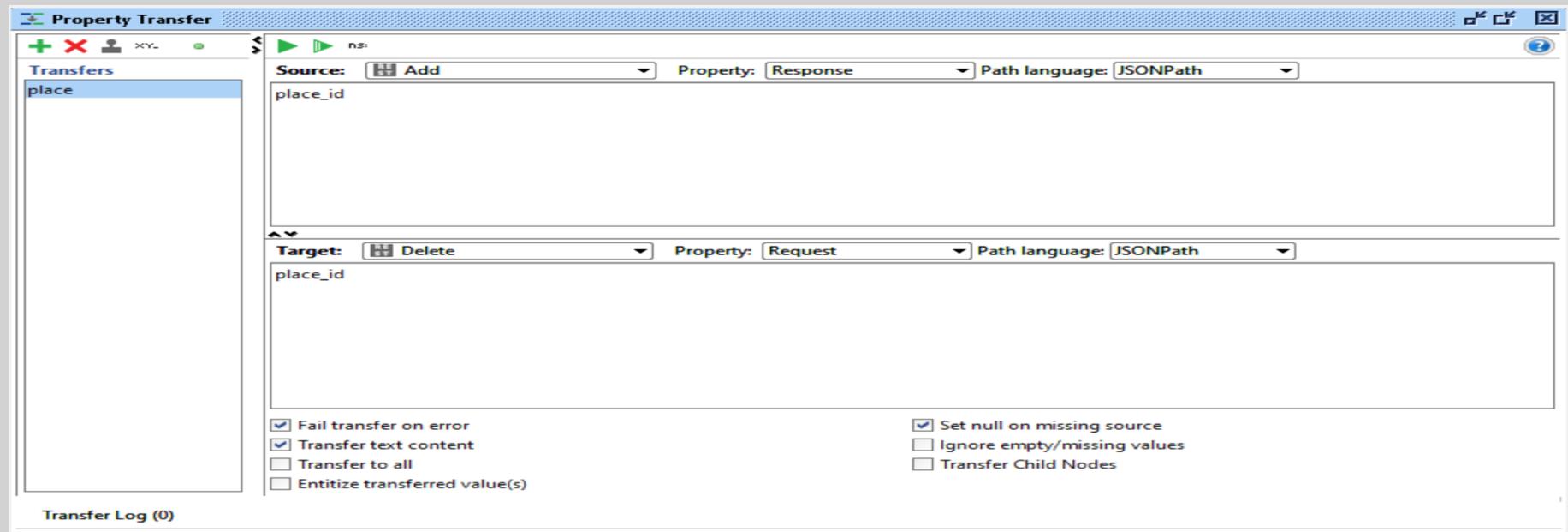
Frequently Asked Questions

Q #1) What is API Testing?

- **Answer:** API is a collection of routines, tools, protocols that together are required for building the software application. Any system software or application software which consists of multiple APIs can perform Application Programming Interface (API) testing.

- This form of testing includes interaction between various or says multiple APIs as well as the interaction between API and application program. The procedure mainly includes making API calls using software and observing system response after receiving the output.

Q #2) Enlist some common tests that are performed on APIs.

- **Answer:** There can be multiple reasons for performing API testing.

- **Let us see some common test examples, where this form of testing is used to verify:**

- Any data structure updated by API which requires proper validation.

- Input condition-based return values.

- Call to another API or if any other event is triggered or some interruption is raised.

- The return values can also be null or wrong results.

- Modification of some resources like an update of the database, process killing, etc.

Q #3) What is the API test environment?

- **Answer:** Setting up a test environment of API is a complex method where the configuration of the server and database is done as per the requirement of the software application. Graphical User Interface (GUI) is not available in this form of testing.

- After installation, API is verified for its proper functioning. In this process initial environment that invokes API is being set up with a defined set of parameters so that test results can be examined.

Q #4) Explain the API testing approach.

- **Answer: Mentioned below are the factors which determine the approach:**

- Write appropriate test cases for the APIs and use testing techniques like boundary value analysis, equivalence class, etc. for verifying the functionality.

- Verify the calls of the combination of two or more value-added parameters.

- Define the scope and basic functionality of the API program.

- Define the accurate input parameters.

- Test case execution and comparison of the results with expected results.

- Determining API behaviour under conditions like the connection with files, etc.

Q #5) Explain in brief the different types of output observed of an API.

- **Answer:** API is considered as the essential connecting part of this digital world. It basically resides in the business logic layer where it performs functions like processing commands, application coordination, initiates logical decisions, etc.

- The main consideration is returning correct results under any type of conditions. Mainly, the output or results observed of an API are divided into three sections as follows:

- Returning the result status values as 'Pass' or 'Fail'.

- Result as data or any specific information.

- An event where the call to any API function will initiate the call to another API function.

Q #6) What are the tools used for API testing?

- **Answer: Best API Testing tools:**

- SOAPUI / Run scope / LOADUI / Curl / Automation API testing

Q #7) What are the tools used for API test automation?

- **Answer:** Automation testing is a must when we talk about agile development in API testing. However, the language in which the code is written is also an important factor as it decides the tool language.

- **Some important API test automation tools are:**

- **SOAPUI:** It is an open-source API testing tool which is considered as the best testing tool because of its feature like creating complex validation scripts and test cases, efficient test coverage, etc.

- **HP QTP/UFT:** This is now known as HP UFT i.e. Unified Functional Testing. This tool is basically used for systems without user interface like web services, etc.

- **PARASOFT:** This testing tool runs on various platforms and is used to test API which does not have a Graphical User interface (GUI).

- HTTP master

- NUnit and JUnit testing tools are used where the code is written in .Net and Java respectively.

Q #8) What is the API framework?

- **Answer:** API framework is described by the config file which consists of the list of all APIs that are required to be activated and are activated for any particular program run. This is essential as every test run does not require all APIs.

- The purpose of the 'Config' file is to describe and enlist every configurable component within a test run.

Q #9) Explain API documentation.

- **Answer:** As it is a well aware fact that, for any foundation, there has to be good documentation. API documentation likewise, serves as a quick reference for accessing the library or working within a program.

- When we go through any such documents, it must consist of a proper plan, content source, proper layout or sketch for delivery, information related to each function, etc.

- **API documentation tools are:**

- JavaDoc

- Doxygen