

CLIENT-SIDE WEB SERVICES

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Examples of publicly available web services

- ✓ Flickr provides open API. Anyone can write program to present public Flickr data (like photos, video, tags, profiles or groups) in new and different ways to explore Flickr.

<https://www.flickr.com/services/api/>



- ✓ Youtube provides sample REST API make basic YouTube request (e.g. upload video and annotations)

https://developers.google.com/youtube/v3/guides/uploading_a_video



- ✓ Place API Web Services provides requests getting data from the same database used by Google Maps

<https://developers.google.com/places/web-service/>

<https://developers.google.com/places/web-service/intro>



- ✓ Requests to the Facebook Graph API using access tokens.

<https://developers.facebook.com/docs/graph-api/using-graph-api>

- ✓ Twitter Standard search API: returns a collection of relevant Tweets matching a specified query.

<https://developer.twitter.com/en/docs/tweets/search/api-reference/get-search-tweets.html>



- ✓ Amazon web services: webapps, backup, big data & analytics

<https://aws.amazon.com/getting-started/>



- ✓ Many companies publish software on the Web as a web service

(www.w3schools.com/xml/xml_services.asp)

- ✓ Main standards: **HTTP** is used to transport the data, **XML** to tag the data, **SOAP** to transfer the data, **WSDL** for describing the services available and **UDDI** lists what services are available.

http://en.wikipedia.org/wiki/Web_service

- ✓ **REST** is a lightweight method to transfer data: a defined request-response message system, expressed in **JSON** or **XML**, exposed via **HTTP**.
- ✓ *Google, Yahoo Amazon and eBay* provide web services; many governments collect a lot of data, opening up access to this data via web services. Web services can be provided with the REST or SOAP method.
- ✓ **UDDI** is a standard for XML-based registry, to automate the discovery and the integration between web services. The provider publishes the WSDL to UDDI registry and the requester can join to it using SOAP.
- ✓ The **SOAP** (Simple Object Access Protocol) is an XML-based protocol to exchange messages between a requester and a provider of a Web Service:
www.w3schools.com/xml/xml_soap.asp

JSON Example

```
{ "employees": [  
  { "firstName": "John", "lastName": "Doe" },  
  { "firstName": "Anna", "lastName": "Smith" },  
  { "firstName": "Peter", "lastName": "Jones" }  
]}
```

XML Example

```
<employees>  
  <employee>  
    <firstName>John</firstName> <lastName>Doe</lastName>  
  </employee>  
  <employee>  
    <firstName>Anna</firstName> <lastName>Smith</lastName>  
  </employee>  
  <employee>  
    <firstName>Peter</firstName> <lastName>Jones</lastName>  
  </employee>  
</employees>
```

✓ SOAP vs REST (<https://blog.udemy.com/rest-vs-soap/>)

	SOAP	REST
Architecture	SOAP is basically a SOA based architecture that can be used for middleware interoperability.	REST is basically an architecture designed for web based communication assuming only point to point communication
Reliability	Reliable	Not Reliable
Requirements	Requires standard tools with middleware support	Doesn't require any standard tools but requires a standard URI for information exchange
Communication Language	Works purely on XML based on WSDL standards	Supports JSON, XML, Microformats etc.
Payload	Payload must support SOAP schema	Payload can be of any format

✓ HTML-based (i.e., non-UDDI¹) registry of public web services:

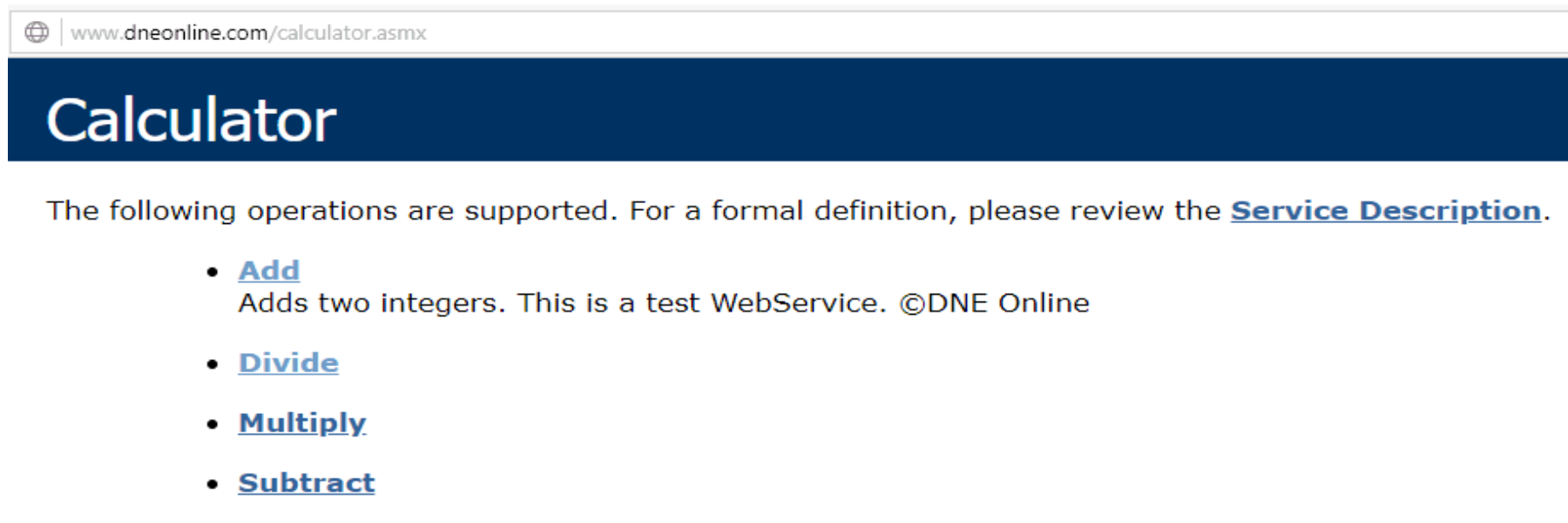


Name	Description	Rating	Availability	Action
✓ SVG to PNG	Conversion of SVG file to PNG file	★★★★★	100%	Call it!
✓ Weather		★★★★★	96.79%	Call it!
⚡ CentileWSService	in input, takes a list of numbers s	★★★	66.83%	Call it!
✓ Shortest path computation	A private key is required. Please refer to the following link to have a free instant access : http...	★★★	100%	Call it!
⚡ TopMovies		★★★	23.7%	Call it!
✓ DeFactoSF1	2010 Census Demographic Data by Race, Housing, Zip, City, State, Municipality	★★★	97.91%	Call it!
⚡ EmailCheckService	This is Service which check the given email id is really existed or not If the email id is exist,it ...	★★★	0%	Call it!
✓ GlobalWeather		★★★	97.77%	Call it!
✓ Calculator		★★★	94.83%	Call it!
✓ SendService	Methods to send SMS messages individually and in batches. Click here for a <a href="https://www.esend...	★★★	61.54%	Call it!
✓ latex		★★★	98.24%	Call it!

✓ Service availability statistics: 100% is not realistic, usually 99.50% - 99.95%

¹ UDDI is a standard for an XML-based registry, to automate the discovery and the integration between web services. The provider publishes the WSDL to UDDI registry and the requester can join to it using SOAP. The SOAP is an XML-based protocol to exchange messages between a requester and a provider of a Web Service.

- ✓ Simple test Web Service: **Calculator**
<http://www.dneonline.com/calculator.asmx>

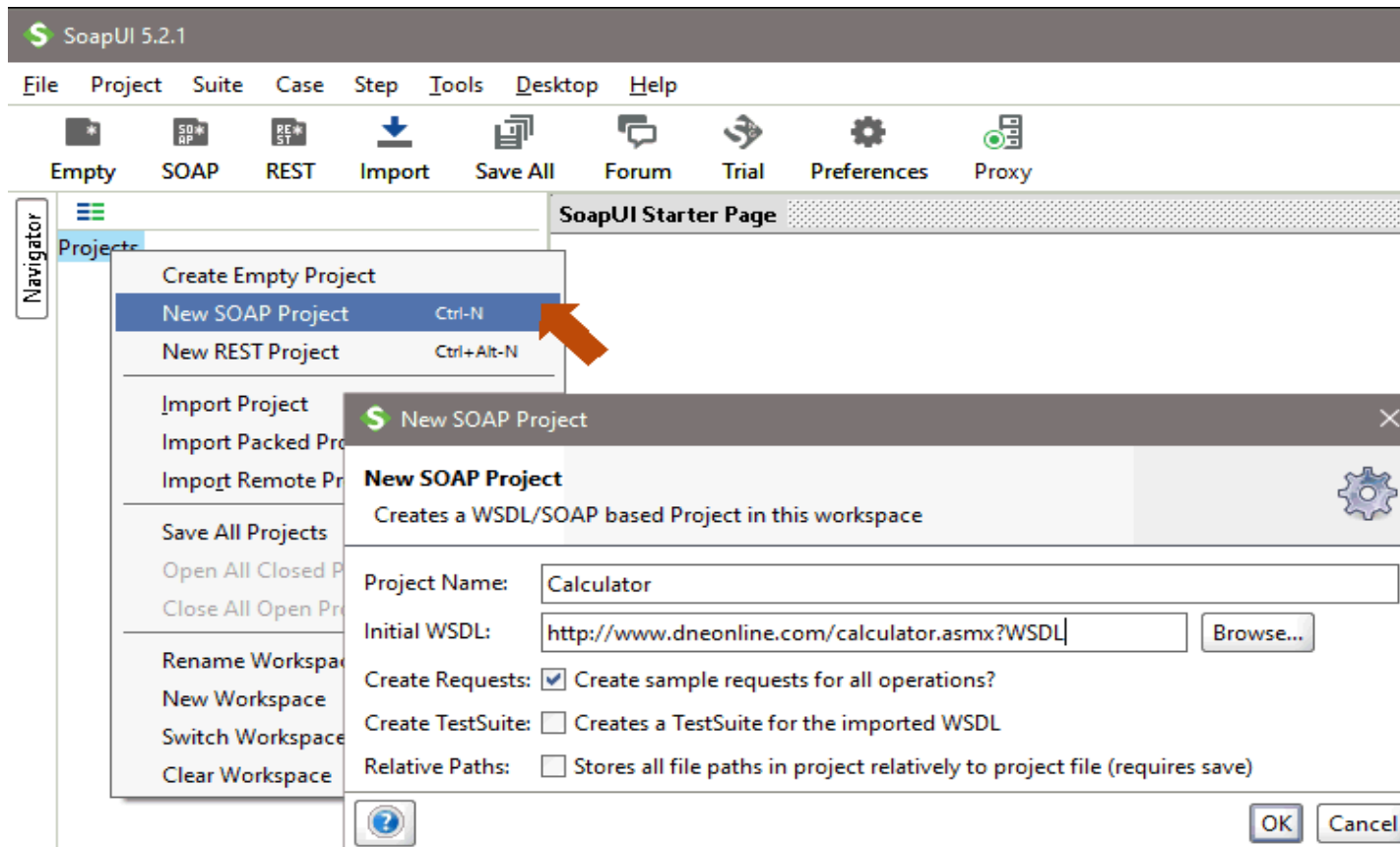


- ✓ The *Interface* contains a list of basic operations: *add*, *divide*, *multiply*, *subtract*.

SoapUI

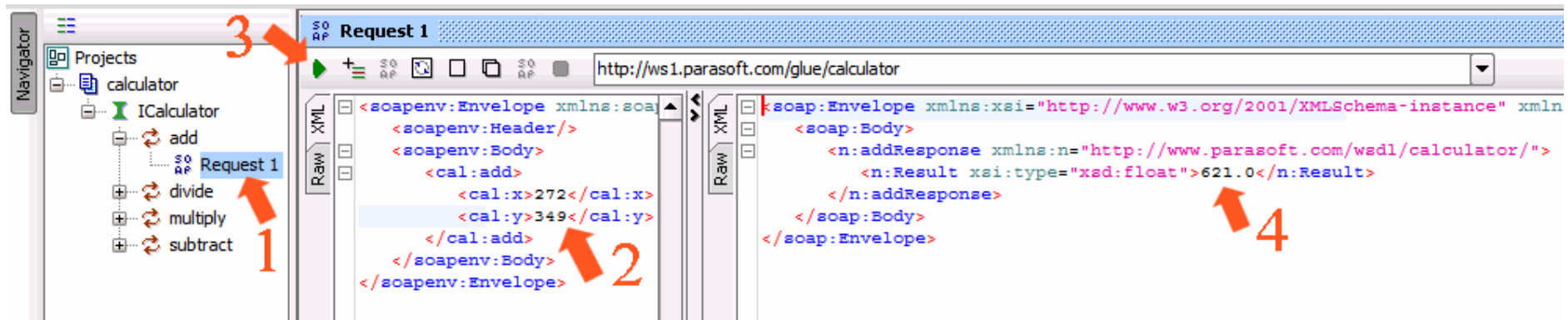
- ✓ SoapUI is a functional testing tool for Web Services.
- ✓ Install: (win64) <http://www.iet.unipi.it/m.cimino/sse/res/SoapUI-x64-4.6.4.exe>
(other OS) <http://sourceforge.net/projects/soapui/files/soapui/4.6.4/>
- ✓ Double Click on \sopai4\bin\SoapUI-4.6.4.exe
- ✓ On the left frame, right button on the root *Projects* → *New SOAP Project*

- ✓ p. name: *calculator*, i. wsdl²: *http://www.dneonline.com/calculator.asmx?WSDL*



- ✓ Expand the *Calculator* root, expand the *add* operation, double click on *Request 1*
- ✓ Replace question marks with two numeric values in the *cal:x* and *cal:y* elements (2)
- ✓ Click on the green play button (3)
- ✓ Read the soap response, from the *n:result* element (4)

² WSDL stands for Web Services Description Language. It is an XML document describing a Web service. It specifies the location of the service and the operations (or methods) the service exposes.



Sendsoap

- ✓ It is a Java-based SOAP client.
Download: <http://www.iet.unipi.it/m.cimino/sse/res/sendsoap.zip>
Click on *make.bat* to carry out an example.
- ✓ `resp = SOAPClient.sendMess(url, mess)` sends SOAP messages (see the *SOAPapp* class)
String sendMess(**String** url, **String** mess)