



## A Study on JSON Web Services and Public Web APIs

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### ARTICLE INFO

#### Article history:

Received: 23 December 2016;

Accepted: 5 January 2017;

Published: 10 January 2017;

#### Keywords

REST,

Web repository,

Web service discovery,

API.

### ABSTRACT

Web Services describes an identical way of integrating Web-based applications. For satisfying users demands these services have higher probability. All these services are publicly offered as a web data in the web repository. Web Services are of two kinds likely SOAP and REST offer different methods to invoke a service. Mobile and cloud applications, social networking websites, and automated business processes are among the drivers fueling the need for RESTful Web APIs. A survey on approach that is to be applied for analyzing and selecting web services from the number available web service is be conducted.

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### Introduction

A web service is any slice of software that sorts itself available over the internet and uses an identical XML messaging system. XML is used to encode all communications to a web service. For example, a client invokes a web service by transferring an XML message, then waits for a corresponding XML response. Web services can be written in any language and run on any platform. The main advantage of web services are loosely coupled, ease of integration, service reuse. A classy system has three main components are registry, provider and a consumer. There are two major classes of web services. First REST accommodating web services in which the key purpose of the deal is to manipulate the representation of web properties using an even set of state fewer operations. Second, web services which expose a subjective set of process. SOAP and REST both have favourable abilities and have been compared to each other from the start. To overcome the challenges of SOAP a RESTful web services can be applied. RESTful is an architectural style for networked multimedia applications. This is used for structure the light weight, scalable and maintainable web services.

### JSON versus XML

Since XML is also used as data swapping format broadly, needs to draw a comparison between JSON and XML. XML is more expressive than JSON and unluckily drudgery or monotonous routines. XML sometimes also suffers from using tags repeatedly, whereas JSON is much more concise. Suspiciously XML is more complex than JSON in order to traversing the content. There are several specifications to define schema (metadata) for XML, for example DTD and XSD. JSON schema is there for doing the same for JSON, but it is not as widely used as XML schemas. XML can be used with most of the programming languages as JSON. In the case of JSON though, since objects and arrays are basic data structures used, it is easy to work with them in programs.

For selecting specific parts of an XML document, there is standard specification called XPath. This is widely used. In JSON, we have JSONPath to do the same, but not widely in use. XML has Xquery specification for querying XML data. JSON though have JAQL, JSONiq etc, but they are not in use widely. XML has XSLT specification which may be used to apply a style to an XML document. JSON does not have any such thing.

### Effectiveness of RESTful Technique

One of the key powers of REST is its simplicity. For example, in a transactional, online e-commerce type of system, people need to be able to browse products, select products, view and edit their cart, enter payment and shipping information and then make a final decision to pay. At any point up to the point where the user completes their checkout, users need to be able to navigate back to a previous step. From a pure API standpoint, this means mapping all the important parts of the transaction into resources via URIs. At the end, the transaction is completed by sending a final HTTP request that coordinates the state of each of the resources involved in the transaction. Probably the transaction can be viewed as a set of one or multiple resources depending on the complexity of the business processes. In order not to map what is really used to doing with RPC in one request is possibly occurred.

In case of REST invocation the service can be invoked by means of the following four requests such as GET, POST, PUT and DELETE. In order to access each process of progress in the online transaction the client is only need to send any of the four requests and the server will respond as per the type of the request.

### A tour to JSON

JSON is JavaScript Object Notation, and is a method to store information in an organized, easy-to-access manner. In a nutshell, it gives us a human-readable collection of data that can access in a certainly logical and usually effective manner.

### Structure of JSON Data

The data can be declared any number of properties using key-value pairs as following

```
{
"age" : "23",
"hometown" : "Dallas, TX",
"gender" : "male"
};
```

The above text creates an object that we can access using any identifier or variable. Inside an object we may have any number of key-value pairs. Probably the objects are to be flexible to access in the form of sending request from client by means of URI. There are four basic and built-in data types in JSON. They are strings, numbers, Booleans and null. Moreover, there are two data types which are structured - objects and arrays. Objects are wrapped within '{' and '}'.

### JSON Objects in an array

```
{
[[
"age" : "23",
"hometown" : "Dallas, TX",
"gender" : "male"
]
{
"age" : "24",
"hometown" : "Greenville, NC",
"gender" : "female"
}
]
};
```

Arrays are enclosed by '[' and ']'. Objects are a list of label-value pairs. Arrays are list of values. Both objects and arrays can be nested. Strings, numbers, Booleans and null can be used as values.

### Public Web API

A Public API may be a public accessible application programming interface that provides a programmatic access to the developers. A Public API is usually available for access to any or all developers. These API's enable developers to access the backend data which might be used more to reinforce their own applications. Once employed in the context of Web development, an API is usually outlined as a group of Hypertext Transfer Protocol (HTTP) request messages, alongside a definition of the structure of response messages that is typically an extensible markup language (XML) or JavaScript Object Notation (JSON) format. A web API is an ideal platform for building RESTful applications. Web API is a framework for building HTTP services that can be consumed by a broad range of clients including browsers, mobiles, iphone and tablets. These RESTful web APIs are accessible via standard HTTP methods by a variety of HTTP clients including browsers and mobile devices. Today, a web based application is not enough to reach its customers. People are very smart, they are using iphone, mobile, tablets etc. devices in its daily life. These devices also have a lot of apps for making the life easy. Actually, we are moving from the web towards apps world. So, if you like to expose your service data to the browsers and as well as all these modern devices apps in fast and simple way, you should have an API which is compatible with browsers and all these devices.

Public API's 3 main characteristics:

- They're free for anyone to public use.
- API's are accessible to use by all developers.

- They're generally backed by public data.

### Working of Web API

APIs are especially important because they dictate how developers can create new apps that tap into big Web Services – social networks like Facebook, Pinterest, for instance, or utilities like Google. The developer of a game app, for instance, can use the Dropbox API to let users store their saved games in the Dropbox cloud instead of working out some other cloud-storage option. In one sense, then, APIs are great time savers. They also offer user convenience in many cases. Many governments collect a lot of data, and some governments are now opening access to this data. The interfaces through which this data is typically made accessible are web APIs. Web APIs allow for data, such as “budget, public works, crime, legal and other agency data to be accessed by any developer in a convenient manner.

### Why Web API

Web API is the best option available today for Web Services. If the user wants a Web Service other than SOAP, Web API is the right option. It creates simple HTTP Services. And they are no tedious or extensive configuration with the Web API. Simple services can be created instantly without much difficulty also it is lightweight and is good for devices such as Smartphones and finally its open source.

### Features of Web API

It supports convention-based CRUD Actions since it works with HTTP verbs GET, POST, PUT and DELETE. Responses have an Accept header and HTTP status code. Responses are formatted by Web API's MediaTypeFormatter into JSON, XML or whatever format you want to add as a MediaTypeFormatter. It may accepts and generates the content which may not be object oriented like images, PDF files etc.

### Conclusion

In this paper the JSON Web Services and the public Web API are explored to learn about them. A comparison between XML and JSON is made. This comparison proved that JSON is not complicated like XML. Also as objects and arrays are the data structures used in JSON, it is easy for the developers to access the data to expose as a service to the customers. JSON is the most popular format being used in web services. It is identified that Web APIs are the best option to explore the Web Services. As Web APIs are accessible by anyone who uses them, it helps to offer better Web Services. A RESTful web service usually defines a URI, Uniform Resource Identifier a service, provides resource representation such as JSON and set of HTTP Methods. Web APIs and JSON are used in RESTful Web Services in order to provide better networked applications.

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