JSON (JavaScript Object Notation)

JSON (JavaScript Object Notation - Notação de Objetos JavaScript) é uma formatação leve de troca de dados. Para seres humanos, é fácil de ler e escrever. Para máquinas, é fácil de interpretar e gerar. JSON é em formato texto e completamente independente de linguagem, pois usa convenções que são familiares às linguagens C e familiares, incluindo C++, C#, Java, JavaScript, Perl, Python e muitas outras. Estas propriedades fazem com que JSON seja um formato ideal de troca de dados.

A piece of JSON must represent either:

- A collection of name/value pairs (`{ }`). In various languages, this is realized as an object, record, struct, dictionary, hash table, keyed list, or associative array.
- An ordered list of values (`[ ]`). In various languages, this is realized as an array, vector, list, or sequence.

JSON in its purest form has no actual **comments**, but most parsers will accept C-style (`//`, `/* */`) comments. Some parsers also tolerate a trailing comma (i.e. a comma after the last element of an array or the after the last property of an object), but they should be avoided for better compatibility.

Supported data types:

- **Strings**: "hello", "\"A quote.\"", "\u0abe", "Newline.\n"
- **Numbers**: 23, 0.11, 12e10, 3.141e-10, 1.23e+4

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- **Objects**: { "key": "value" }
- **Arrays**: ["Values"]
- **Miscellaneous**: true, false, null

```
{
  "key": "value",

  "keys": "must always be enclosed in double quotes",
  "numbers": 0,
  "strings": "Hellø, world. All unicode is allowed, along with \"escaping\".",
  "has bools?": true,
  "nothingness": null,

  "big number": 1.2e+100,

  "objects": {
    "comment": "Most of your structure will come from objects.",

    "array": [0, 1, 2, 3, "Arrays can have anything in them.", 5],

    "another object": {
      "comment": "These things can be nested, very useful."
    }
```

```
  },


  "silliness": [
    {
      "sources of potassium": ["bananas"]
    },
    [
      [1, 0, 0, 0],
      [0, 1, 0, 0],
      [0, 0, 1, "neo"],
      [0, 0, 0, 1]
    ]
  ],
}
```

Get values

```
var jason = {
     "age" : "24",
     "hometown" : "Missoula, MT",
     "gender" : "male"
};


document.write('Jason is ' jason.age); // Output: Jason is 24
document.write('Jason is a ' jason.gender); // Output: Jason is a
male
```

Arrays

```
var family = [{
```

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```
        "name" : "Jason",
        "age" : "24",
        "gender" : "male"
    },
    {
        "name" : "Kyle",
        "age" : "21",
        "gender" : "male"
    }];

document.write(family[1].name); // Output: Kyle
document.write(family[0].age); // Output: 24
```

Nesting

```
var family = {
    "jason" : {
        "name" : "Jason Lengstorf",
        "age" : "24",
        "gender" : "male"
    },
    "kyle" : {
        "name" : "Kyle Lengstorf",
        "age" : "21",
        "gender" : "male"
    }
}

document.write(family.jason.name); // Output: Jason Lengstorf
document.write(family.kyle.age); // Output: 21
document.write(family.jason.gender); // Output: male
```

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How Do We Load JSON into a Project?

One of the easiest ways to load JSON data into our web applications is to **use the $.ajax() method available in the jQuery library.** The ease of retrieving data will vary based on the site providing the data, but a simple example might look like this:

```
$.ajax(
            type:'GET',
            url:"http://example.com/users/feeds/",
            data:"format=json&id=123",
            success:function(feed) {
                document.write(feed);
            },
            dataType:'jsonp'
        );
```

Fontes e mais recursos

https://learnxinyminutes.com/docs/json/
https://learnxinyminutes.com/docs/pt-br/json-pt/
https://www.copterlabs.com/json-what-it-is-how-it-works-how-to-use-it/
https://www.json.org/
https://www.w3schools.com/js/js_json_intro.asp

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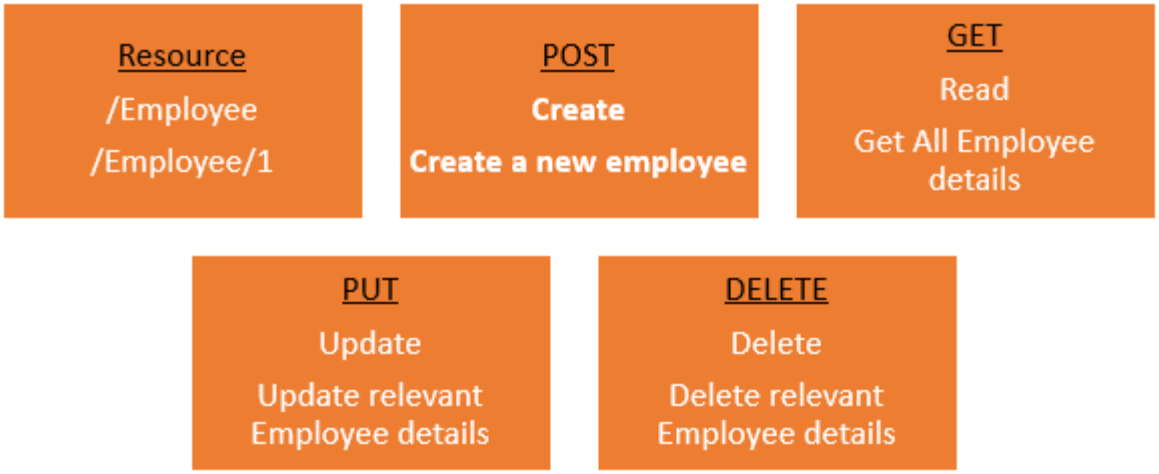
REST-compliant Web Services

What is Restful Web Service?

REST is used to build Web services that are lightweight, maintainable, and scalable in nature. A service which is built on the REST architecture is called a RESTful service. The underlying protocol for REST is HTTP, which is the basic web protocol. REST stands for REpresentational State Transfer

Restful Methods

The below diagram shows mostly all the verbs (POST, GET, PUT, and DELETE) and an example of what they would mean.



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Why Restful

Restful mostly came into popularity due to the following reasons:

1. **Heterogeneous languages and environments** – This is one of the fundamental reasons which is the same as we have seen for SOAP as well.

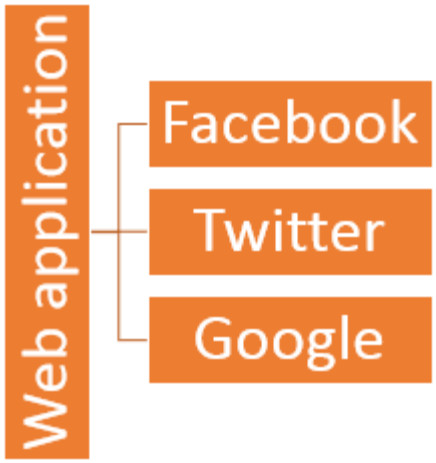
    - It enables web applications that are built on **various programming languages to communicate with each other**
    - With the help of Restful services, these web applications **can reside on different environments**, some could be on **Windows**, and others could be on **Linux**.

The below picture gives an example of a web application which has a requirement to talk to other applications such Facebook, Twitter, and Google.

Now if a client application had to work with sites such as Facebook, Twitter, etc. they **would probably have to know what is the language Facebook, Google and Twitter are built on, and also on what platform** they are built on.

Based on this, we can write the interfacing code for our web application, but this could prove to be a nightmare.

Facebook, Twitter, and Google expose their functionality in the form of Restful web services. This allows any client application to call these web services via REST.



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2. The event of Devices – Nowadays, everything needs to work on Mobile devices, whether it be the mobile device, the notebooks, or even car systems.

   Can you imagine the amount of effort to try and code applications on these devices to talk with normal web applications? Again Restful API's can make this job simpler because as mentioned in point no 1, you really don't need to know what is the underlying layer for the device.

3. Finally is the event of the Cloud – Everything is moving to the cloud. Applications are moving to cloud-based systems such as in Azure or Amazon. Azure and Amazon provide a lot of API's based on the Restful architecture. Hence, applications now need to be developed in such a way that they are made compatible with the Cloud. So since all Cloud-based architectures work on the REST principle, it makes more sense for web services to be programmed on the REST based architecture to make the best use of Cloud-based services.

Restful Architecture

An application or architecture considered RESTful or REST-style has the following characteristics

1. State and functionality are divided into distributed resources – This means that every resource should be accessible via the normal HTTP commands of GET, POST, PUT, or DELETE. So if someone wanted to get a file from a server, they should be able to issue the GET request and get the file. If they want to put a file on the server, they should be able to either issue the POST or PUT request. And finally, if they wanted to delete a file from the server, they an issue the DELETE request.
2. The architecture is client/server, stateless, layered, and supports caching –

- Client-server is the typical architecture where the server can be the web server hosting the application, and the client can be as simple as the web browser.
- Stateless means that the state of the application is not maintained in REST.

For example, if you delete a resource from a server using the DELETE command, you cannot expect that delete information to be passed to the next request.

Fontes e mais recursos

https://www.guru99.com/restful-web-services.html
https://www.codecademy.com/articles/what-is-rest

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