JavaScript Ajax

Definition
Works
Example
JSON

Definition - Ajax

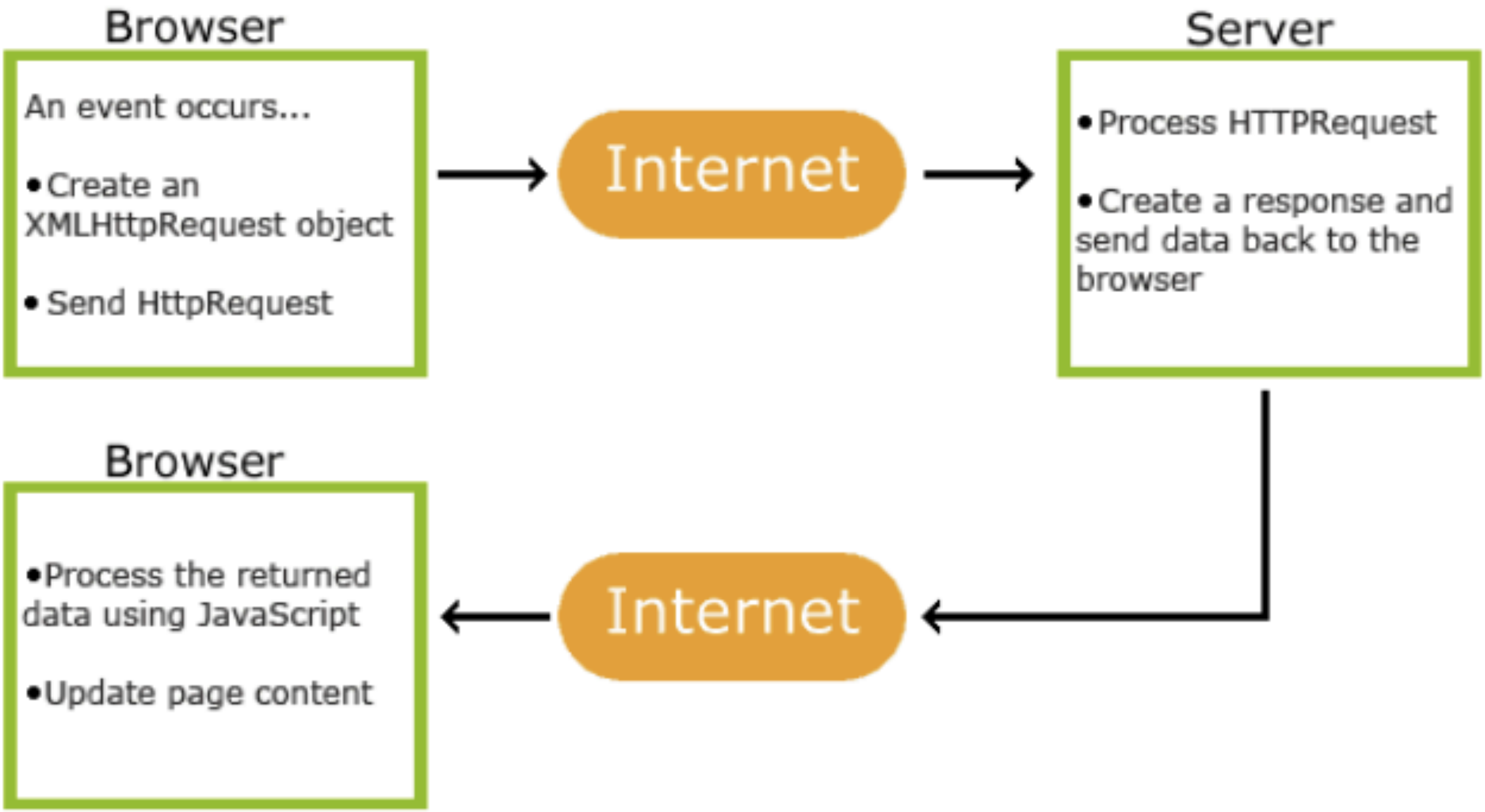
- Asynchronous JavaScript And XML.

- With Ajax, web applications can send and retrieve data from a server asynchronously (in the background) without interfering with the display and behaviour of the existing page.

- Ajax allows web pages and, by extension, web applications, to change content dynamically without the need to reload the entire page.

- Ajax is not a new technology, or different language, just existing technologies used in new ways.

How AJAX Works



Browser

An event occurs...

- Create an XMLHttpRequest object
- Send HttpRequest

Internet

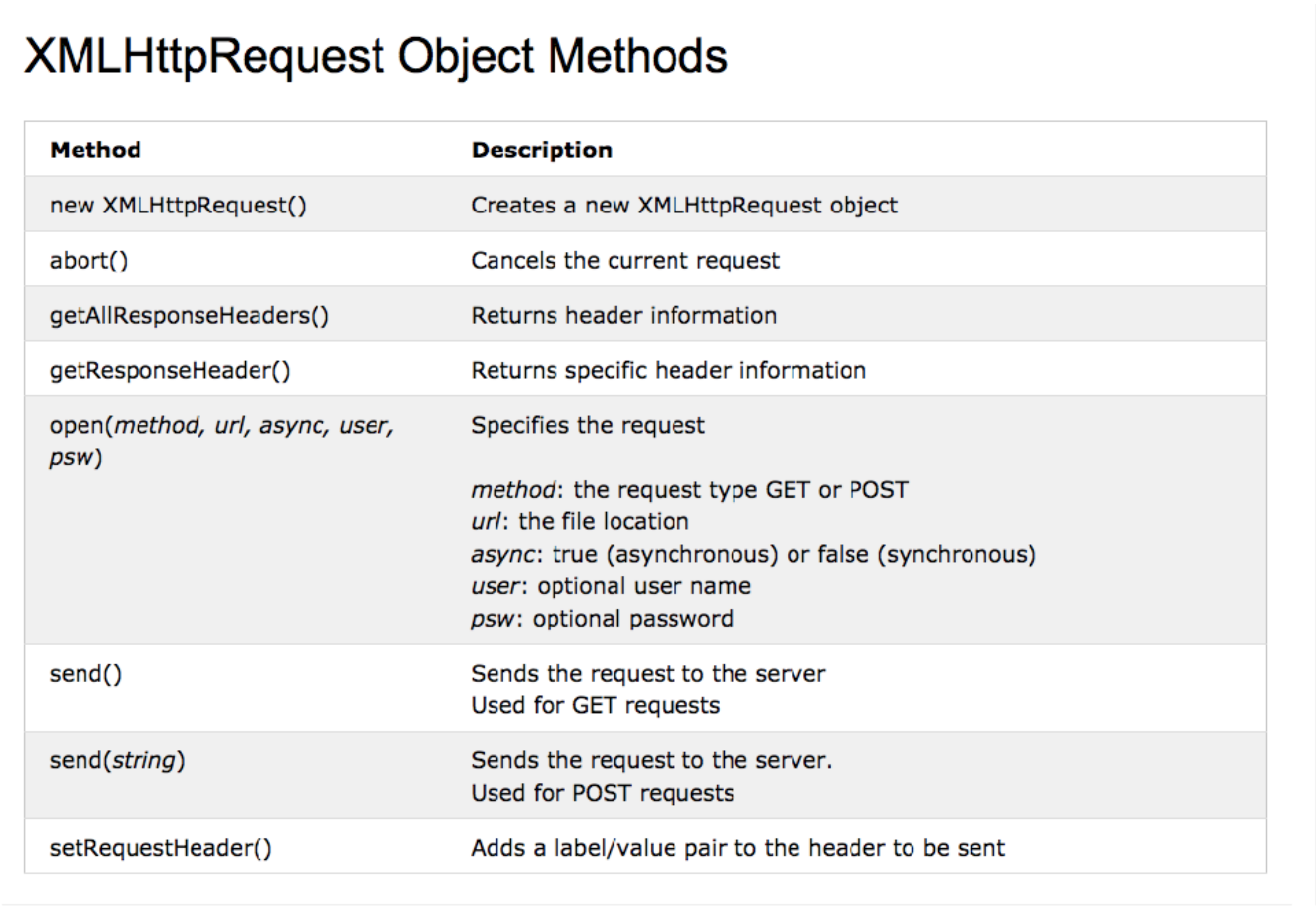
Server

- Process HTTPRequest
- Create a response and send data back to the browser

Internet

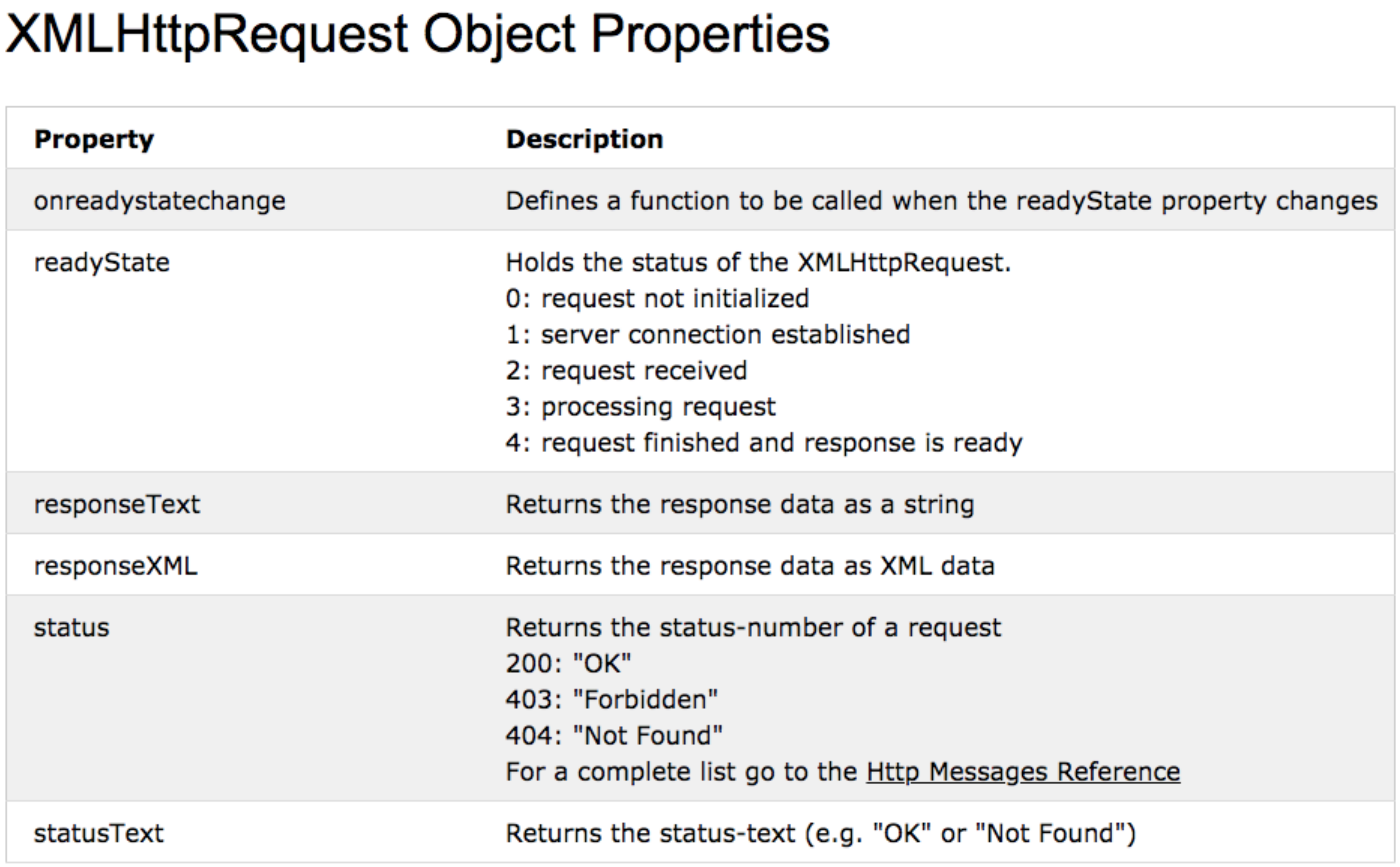
Browser

- Process the returned data using JavaScript
- Update page content



XMLHttpRequest Object Methods

Method	Description
new XMLHttpRequest()	Creates a new XMLHttpRequest object
abort()	Cancels the current request
getAllResponseHeaders()	Returns header information
getResponseHeader()	Returns specific header information
open(*method, url, async, user, psw*)	Specifies the request *method*: the request type GET or POST *url*: the file location *async*: true (asynchronous) or false (synchronous) *user*: optional user name *psw*: optional password
send()	Sends the request to the server Used for GET requests
send(*string*)	Sends the request to the server. Used for POST requests
setRequestHeader()	Adds a label/value pair to the header to be sent



XMLHttpRequest Object Properties

Property	Description
onreadystatechange	Defines a function to be called when the readyState property changes
readyState	Holds the status of the XMLHttpRequest. 0: request not initialized 1: server connection established 2: request received 3: processing request 4: request finished and response is ready
responseText	Returns the response data as a string
responseXML	Returns the response data as XML data
status	Returns the status-number of a request 200: "OK" 403: "Forbidden" 404: "Not Found" For a complete list go to the Http Messages Reference
statusText	Returns the status-text (e.g. "OK" or "Not Found")

Ajax Example

```
<!DOCTYPE html>
<html>
<body>

<div id="demo">
<h2>The XMLHttpRequest Object</h2>
<button type="button" onclick="loadDoc()">Change Content</
button>
</div>

<script>
function loadDoc() {
  var xhttp = new XMLHttpRequest();
  xhttp.onreadystatechange = function() {
    if (this.readyState == 4 && this.status == 200) {
      document.getElementById("demo").innerHTML =
      this.responseText;
    }
  };
  xhttp.open("GET", "ajax_info.txt", true);
  xhttp.send();
}
</script>

</body>
</html>
```

https://www.w3schools.com/js/tryit.asp?filename=tryjs_ajax_first

JSON - Javascript Object Notation

- JSON is comma separated key-value pairs
- Often used as a format for data interchange. XML is no longer used.
- var obj = {“name”: “Rahul”, “age”: 25, “location”: {“state”: “MP”, “city”: “Bhopal”}}
- var obj = [1, 2, 3] // JSON validator
- JSON.stringify() —> Convert JSON object to string
- JSON.parse() —> Convert string to JSON object

Ajax - Drawbacks

- For security reasons, browsers have same origin policy and thus restrict cross-origin requests [client and server domain are different - CORS]

- Ajax is designed for one-way communications with the server. If two way communications are needed (i.e. for the client to listen for events/changes on the server)then WebSockets may be a better option

- Depending on the nature of the Ajax application, dynamic page updates may disrupt user interactions, particularly if the Internet connection is slow or unreliable.

- Most major Web crawlers do not execute JavaScript code, so SEO might be difficult for sites based on AJAX