

AJAX

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Introduction to AJAX

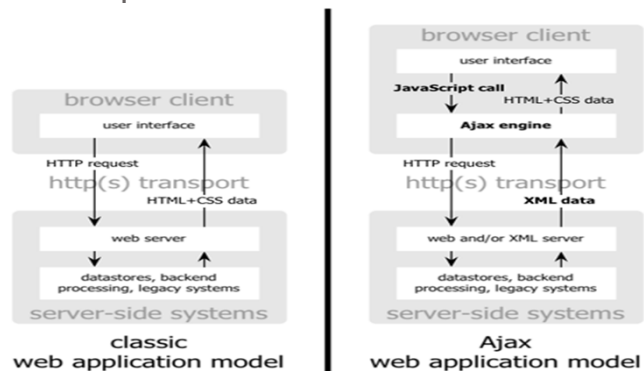
- AJAX = **Asynchronous JavaScript and XML**.
- AJAX is a technique for creating fast and dynamic web pages.
- AJAX allows web pages to be updated asynchronously by exchanging small amounts of data with the server behind the scenes. This means that it is **possible to update parts of a web page, without reloading the whole page**.
- Classic web pages, (which do not use AJAX) must reload the entire page if the content should change.
- Examples of applications using AJAX: **Google Maps, Google Suggest, Gmail, Youtube, Flickr, and Facebook tabs**.
- **AJAX meant to increase the web page's interactivity, speed, and usability.**

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Comparison

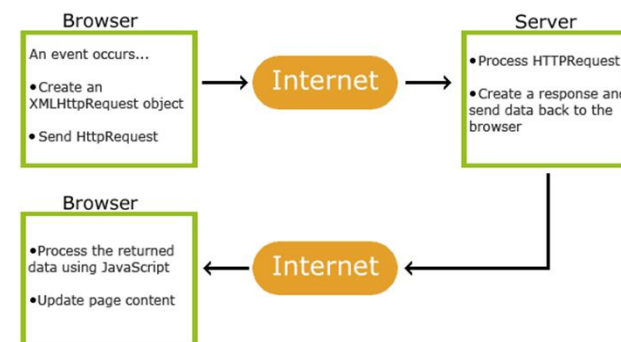


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How AJAX works?



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AJAX is based on Internet Standards

1. XMLHttpRequest object (to exchange data asynchronously with a server)
2. JavaScript/DOM (to display/interact with the information)
3. CSS (to style the data)
4. XML (often used as the format for transferring data)

Note: AJAX applications are browser- and platform-independent!


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Sample

```
<!DOCTYPE html>
<html> <body>
<div id="myDiv"><h2>Let AJAX change this text</h2></div>
<button type="button" onclick="loadXMLDoc()">Change
Content</button>
</body></html>
```



```
<head>
<script>
function loadXMLDoc()
{
... AJAX script goes here ...
}
</script>
</head>
```

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```
<html> <head> <script>
function loadXMLDoc()
{
var xmlhttp;
if (window.XMLHttpRequest)
xmlhttp=new XMLHttpRequest();
xmlhttp.onreadystatechange=function()
{
if (xmlhttp.readyState==4 && xmlhttp.status==200)
document.getElementById("myDiv").innerHTML=xmlhttp.responseText; }
xmlhttp.open("GET","AJAX_TextFile.txt",true);
xmlhttp.send(); } </script> </head> <body>
```

C:/wamp/www/first
AJAX.html

```
<div id="myDiv"><h2>Let AJAX change this text</h2></div>
<button type="button" onclick="loadXMLDoc()">Change
Content</button>
</body> </html>
```

C:/wamp/www/AJAXTextFile.txt

AJAX is not a new programming language.
AJAX is a technique for creating fast and dynamic web pages.

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The XMLHttpRequest Object

The XMLHttpRequest object is **used to exchange data with a server** behind the scenes. This means that it is possible to **update parts of a web page, without reloading the whole page.**

```
var xmlhttp;
if (window.XMLHttpRequest)
{ // code for IE7+, Firefox, Chrome, Opera, Safari
  xmlhttp=new XMLHttpRequest();
}
else
{ // code for IE6, IE5
  xmlhttp=new ActiveXObject("Microsoft.XMLHTTP");
}
```

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Send a Request To a Server

```
xmlhttp.open("GET","ajax_info.txt",true);xmlhttp.send();
xmlhttp.open("GET","demo.asp?t=" + Math.random(),true);
xmlhttp.open("GET","demo.asp?fname=Henry&lname=Ford",true);
```

The file can be any kind of file, like .txt and .xml, or server scripting files like .asp and .php (which can perform actions on the server before sending the response back).

Method	Description
<code>open(method,url,async)</code>	Specifies the type of request, the URL, and if the request should be handled asynchronously or not. method: the type of request: GET or POST url: the location of the file on the server async: true (asynchronous) or false (synchronous)
<code>send(string)</code>	Sends the request off to the server. string: Only used for POST requests

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Asynchronous - True or False?

- Sending asynchronous requests is a huge improvement for web developers. Many of the tasks performed on the server are very time consuming. Before AJAX, this operation could cause the application to hang or stop.
- **With AJAX, the JavaScript does not have to wait for the server response, but can instead:**
 - **execute other scripts while waiting for server response**
 - **deal with the response when the response ready**

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```
xmlhttp.onreadystatechange=function()
{
  if (xmlhttp.readyState==4 && xmlhttp.status==200)
  {
    document.getElementById("myDiv").innerHTML=xmlhttp.responseText;
  }
}
xmlhttp.open("GET","ajax_info.txt",true);
xmlhttp.send();
```

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Async=false

- Using `async=false` is not recommended, but for a few small requests this can be ok.
- Remember that the JavaScript will NOT continue to execute, until the server response is ready. If the server is busy or slow, the application will hang or stop.
- Note:** When you use `async=false`, do NOT write an `onreadystatechange` function - just put the code after the `send()` statement:
- ```
xmlhttp.open("GET", "ajax_info.txt", false);
xmlhttp.send();
document.getElementById("myDiv").innerHTML=xmlhttp.responseText;
```

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### AJAX - Server Response

| Property                  | Description                       |
|---------------------------|-----------------------------------|
| <code>responseText</code> | get the response data as a string |
| <code>responseXML</code>  | get the response data as XML data |

If the response from the server is not XML, use the `responseText` property.

```
document.getElementById("myDiv").innerHTML
=xmlhttp.responseText;
```

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- If the response from the server is XML, and you want to parse it as an XML object, use the `responseXML` property:
- Request the file [cd\\_catalog.xml](#) and parse the response:

```
xmlDoc=xmlhttp.responseXML;
txt=" ";
x=xmlDoc.getElementsByTagName("ARTIST");
for (i=0;i<x.length;i++)
{
 txt=txt + x[i].childNodes[0].nodeValue + "
";
}
document.getElementById("myDiv").innerHTML=txt;
```

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### The onreadystatechange event

- When a request to a server is sent, we want to perform some actions based on the response.
- The `onreadystatechange` event is triggered every time the `readyState` changes.
- The `readyState` property holds the status of the XMLHttpRequest.
- Three important properties of the XMLHttpRequest object:

```
xmlhttp.onreadystatechange=function() {
 if (xmlhttp.readyState==4 && xmlhttp.status==200) {
 document.getElementById("myDiv").innerHTML=
 xmlhttp.responseText; } }
```

**Note:** The `onreadystatechange` event is triggered five times (0-4), one time for each change in `readyState`.

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| Property           | Description                                                                                                                                                                                                                    |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| onreadystatechange | Stores a function (or the name of a function) to be called automatically each time the readyState property changes                                                                                                             |
| readyState         | Holds the status of the XMLHttpRequest.<br>Changes from 0 to 4:<br>0: request not initialized<br>1: server connection established<br>2: request received<br>3: processing request<br>4: request finished and response is ready |
| status             | 200: "OK"<br>404: Page not found                                                                                                                                                                                               |

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## AJAX + PHP

- The following example will demonstrate how a web page can communicate with a web server while a user type characters in an input field:

**Start typing a name in the input field below:**

First name:   
Suggestions: Anna , Amanda

**Start typing a name in the input field below:**

First name:   
Suggestions: no suggestion

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```

<!DOCTYPE html><html><head><script>
function showHint(str){
var xmlhttp;
if (str.length==0) {
document.getElementById("txtHint").innerHTML="";
return; }
if (window.XMLHttpRequest) { // code for IE7+, Firefox, Chrome, Opera, Safari
xmlhttp=new XMLHttpRequest(); }
xmlhttp.onreadystatechange=function() {
if (xmlhttp.readyState==4 && xmlhttp.status==200) {
document.getElementById("txtHint").innerHTML=xmlhttp.responseText; } }
xmlhttp.open("GET","gethint.php?q="+str,true);
xmlhttp.send();}</script></head><body>
<h3>Start typing a name in the input field below:</h3>
<form action="">
First name: <input type="text" id="txt1" onkeyup="showHint(this.value)" />
</form>
<p>Suggestions: </p> </body></html>

```

ajax\_suggest.html

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```

<?php
$a=array("Akila","Arun","Abilash","Bala","Cindrella","Cindy","Danil",
"Florida","Marees","Shree");
$q=$_REQUEST["q"]; $hint="";
if ($q != "") // lookup all hints from array if $q is different from ""
{ $q=strtolower($q); $len=strlen($q);
foreach($a as $name)
{ if (strpos($q,substr($name,0,$len)))
{ if ($hint=="")
{ $hint=$name; }
else
{ $hint .= ", $name"; } } } }
echo $hint==" "? "no suggestion": $hint;?>

```

gethint.php

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