



SNS COLLEGE OF TECHNOLOGY

**Coimbatore-35
An Autonomous Institution**

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai



DEPARTMENT OF INFORMATION TECHNOLOGY

WEB TECHNOLOGY

III YEAR - V SEM

UNIT 5

AJAX



AJAX



Ajax Tutorial

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AJAX tutorial covers concepts and examples of AJAX technology for beginners and professionals.

AJAX is an acronym for **Asynchronous JavaScript and XML**. It is a group of inter-related technologies like **JavaScript**, **DOM**, **XML**, **HTML/XHTML**, **CSS**, **XMLHttpRequest** etc.



AJAX allows you to send and receive data asynchronously without reloading the web page. So it is fast.

AJAX allows you to send only important information to the server not the entire page. So only valuable data from the client side is routed to the server side. It makes your application interactive and faster.



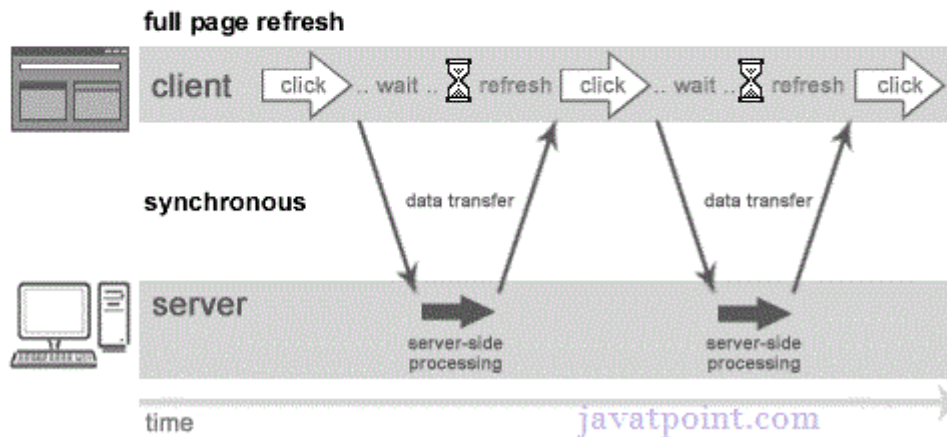
AJAX



Synchronous vs Asynchronous

Synchronous (Classic Web-Application Model)

A synchronous request blocks the client until operation completes i.e. browser is unresponsive. In such case, javascript engine of the browser is blocked.

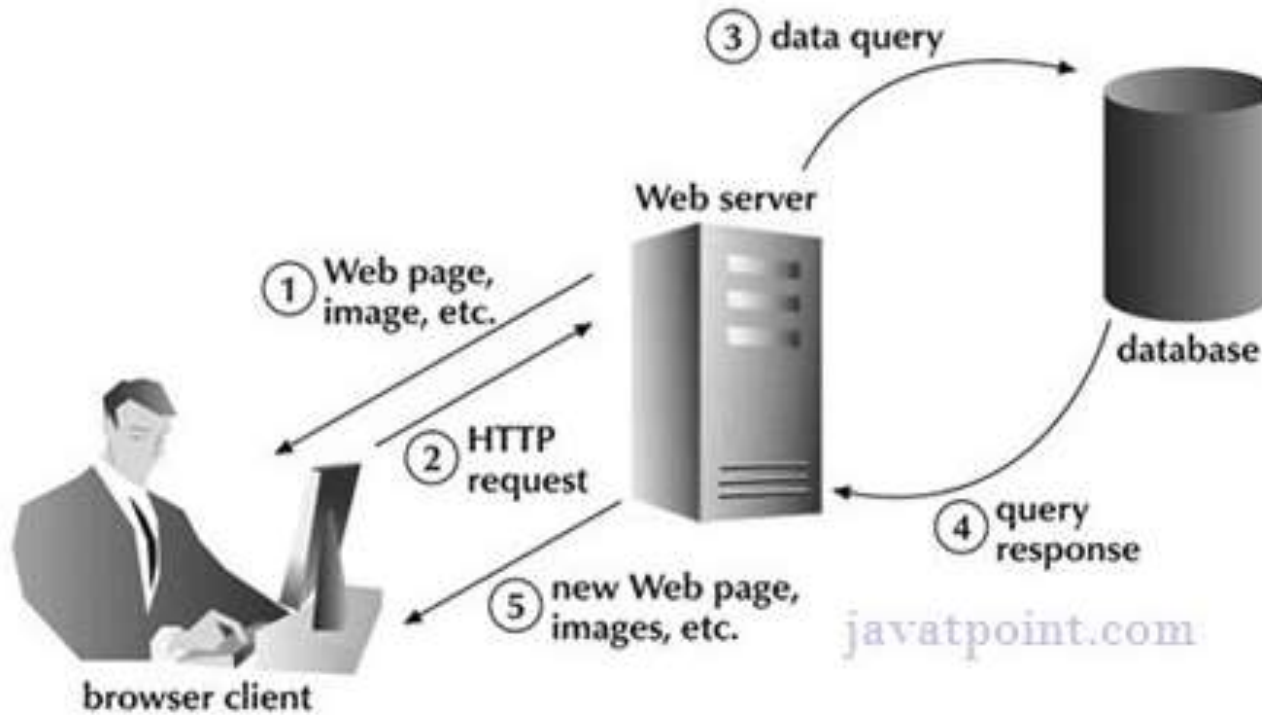


As you can see in the above image, full page is refreshed at request time and user is blocked until request completes.

Let's understand it another way.



AJAX



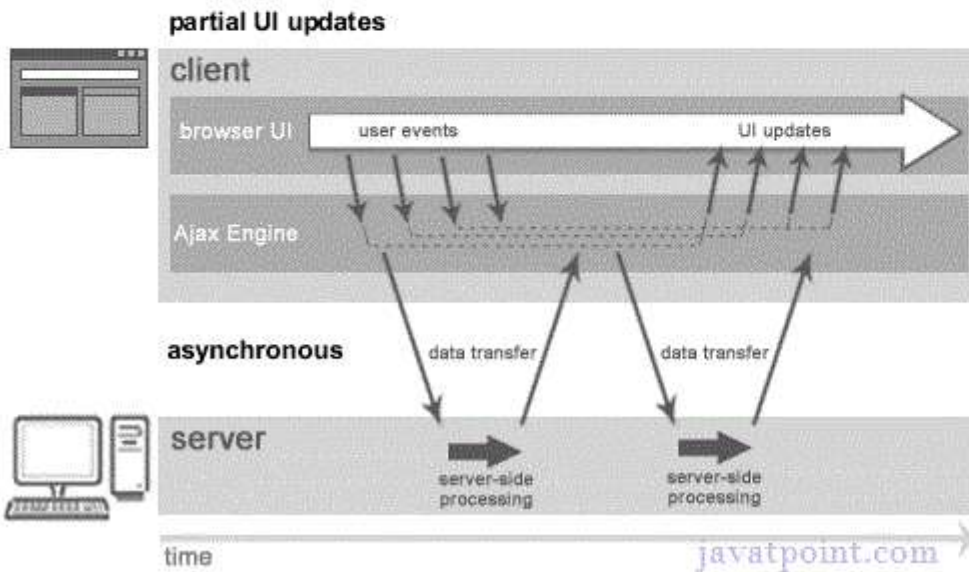


AJAX



Asynchronous (AJAX Web-Application Model)

An asynchronous request doesn't block the client i.e. browser is responsive. At that time, user can perform another operations also. In such case, javascript engine of the browser is not blocked.



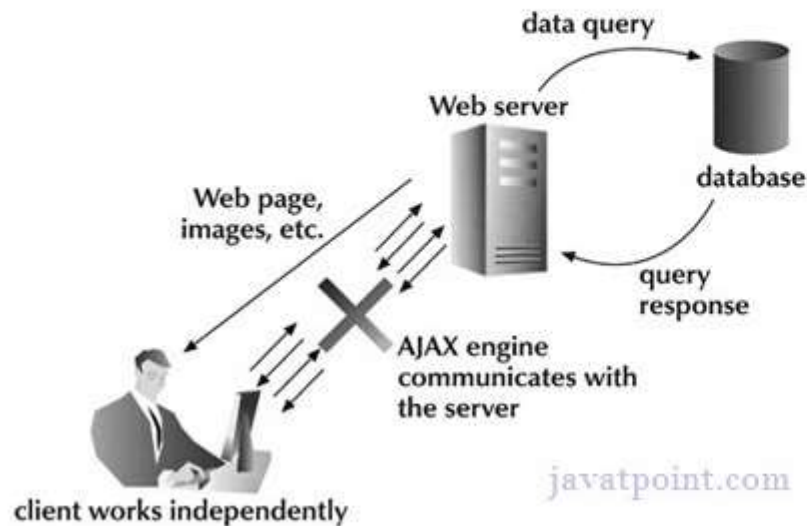


AJAX



As you can see in the above image, full page is not refreshed at request time and user gets response from the ajax engine.

Let's try to understand asynchronous communication by the image given below.





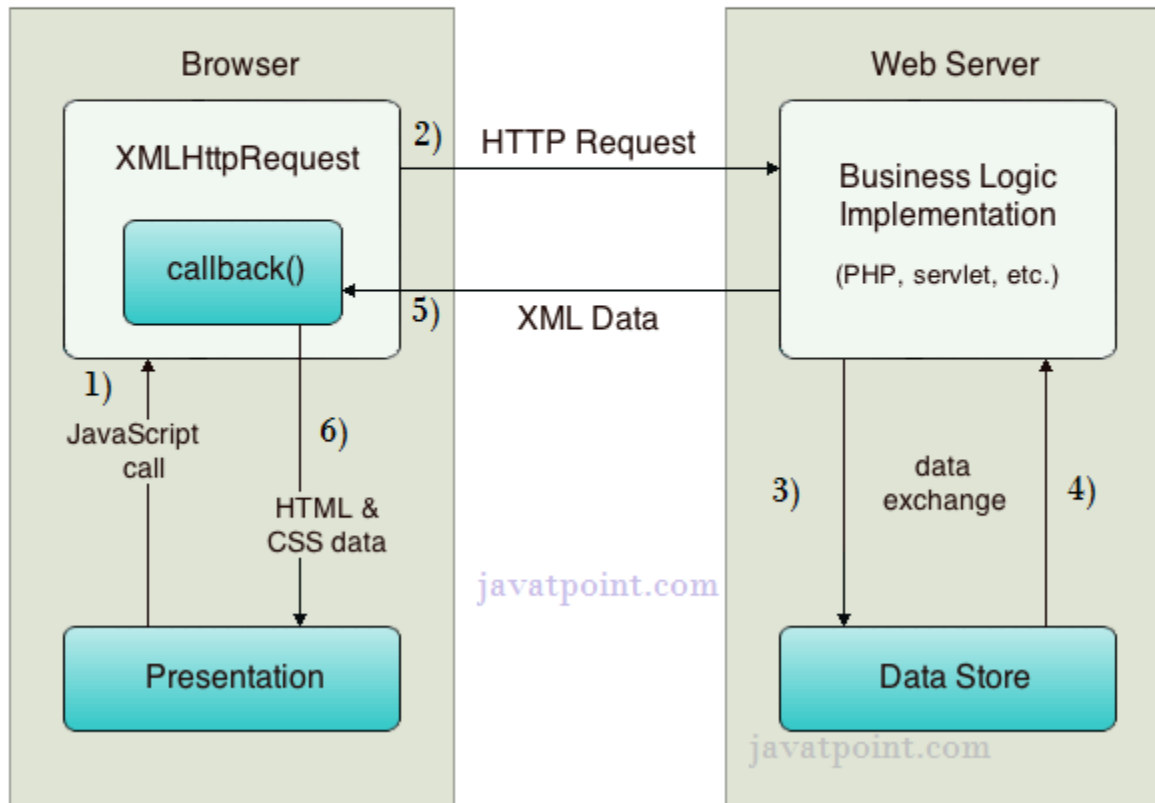
AJAX

How AJAX works?

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AJAX communicates with the server using XMLHttpRequest object. Let's try to understand the flow of ajax or how ajax works by the image displayed below.

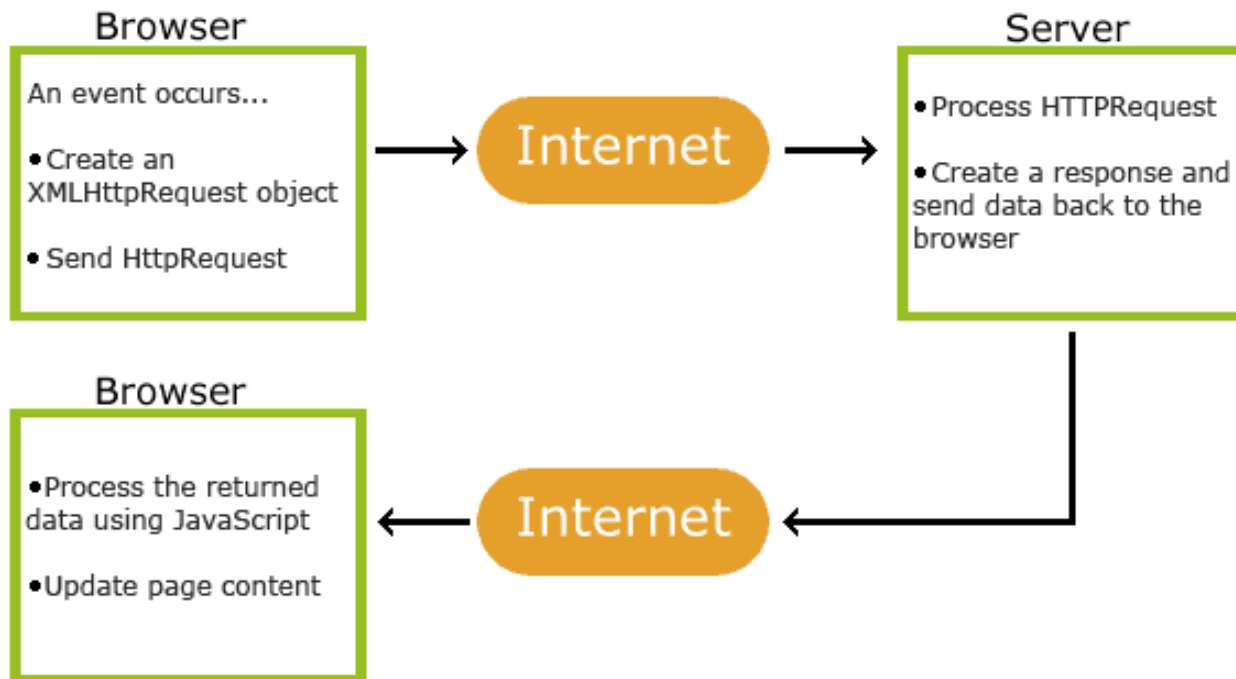




AJAX



How AJAX Works





AJAX

1. An event occurs in a web page (the page is loaded, a button is clicked)
2. An XMLHttpRequest object is created by JavaScript
3. The XMLHttpRequest object sends a request to a web server
4. The server processes the request
5. The server sends a response back to the web page
6. The response is read by JavaScript
7. Proper action (like page update) is performed by JavaScript



AJAX

As you can see in the above example, XMLHttpRequest object plays a important role.

1. User sends a request from the UI and a javascript call goes to XMLHttpRequest object.
2. HTTP Request is sent to the server by XMLHttpRequest object.
3. Server interacts with the database using JSP, PHP, Servlet, ASP.net etc.
4. Data is retrieved.
5. Server sends XML data or JSON data to the XMLHttpRequest callback function.
6. HTML and CSS data is displayed on the browser.



AJAX



Understanding XMLHttpRequest

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An object of XMLHttpRequest is used for asynchronous communication between client and server.

It performs following operations:

1. Sends data from the client in the background
2. Receives the data from the server
3. Updates the webpage without reloading it.

- ▶ XMLHttpRequest
- ▶ Properties of XMLHttpRequest
- ▶ Methods of XMLHttpRequest



AJAX



Properties of XMLHttpRequest object

The common properties of XMLHttpRequest object are as follows:

Property	Description
onReadyStateChange	It is called whenever readyState attribute changes. It must not be used with synchronous requests.
readyState	represents the state of the request. It ranges from 0 to 4. 0 UNOPENED open() is not called. 1 OPENED open is called but send() is not called. 2 HEADERS_RECEIVED send() is called, and headers and status are available. 3 LOADING Downloading data; responseText holds the data. 4 DONE The operation is completed fully.
responseText	returns response as text.
responseXML	returns response as XML



AJAX



Method	Description
<code>void open(method, URL)</code>	opens the request specifying get or post method and url.
<code>void open(method, URL, async)</code>	same as above but specifies asynchronous or not.
<code>void open(method, URL, async, username, password)</code>	same as above but specifies username and password.
<code>void send()</code>	sends get request.
<code>void send(string)</code>	send post request.
<code>setRequestHeader(header,value)</code>	it adds request headers.



AJAX

- Update a web page without reloading the page
- Request data from a server - after the page has loaded
- Receive data from a server - after the page has loaded
- Send data to a server - in the background



AJAX



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

<div id="demo">
<h1>The XMLHttpRequest Object</h1>
<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>
```



AJAX

AJAX

AJAX is not a programming language.

AJAX is a technique for accessing web servers from a web page.

AJAX stands for Asynchronous JavaScript And XML.



AJAX

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

<div id="demo">
  <h2>Let AJAX change this text</h2>
  <button type="button" onclick="loadDoc()">Change Content</button>
</div>

</body>
</html>
```



AJAX

The HTML page contains a `<div>` section and a `<button>`.

The `<div>` section is used to display information from a server.

The `<button>` calls a function (if it is clicked).

The function requests data from a web server and displays it:



AJAX

Function loadDoc()

```
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();  
}
```



AJAX



The "ajax_info.txt" file used in the example above, is a simple text file and looks like this:

```
<h1>AJAX</h1>
<p>AJAX is not a programming language.</p>
<p>AJAX is a technique for accessing web servers from a web page.</p>
<p>AJAX stands for Asynchronous JavaScript And XML.</p>
```