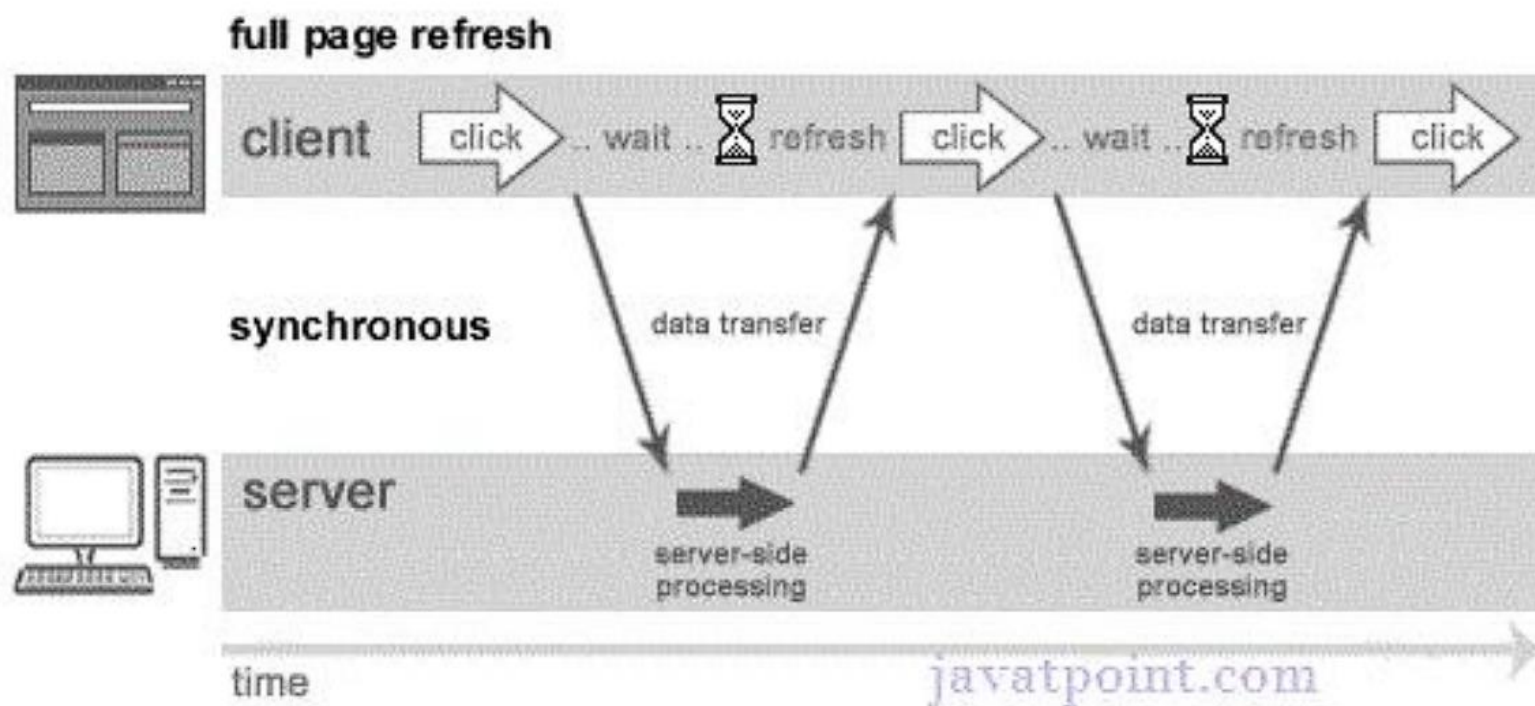# Asynchronous JS and XML(AJAX)

Treemiti Informatics

What is AJAX?

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

- There are too many web applications running on the web that are using ajax technology like gmail, facebook, twitter, google map, youtube etc.
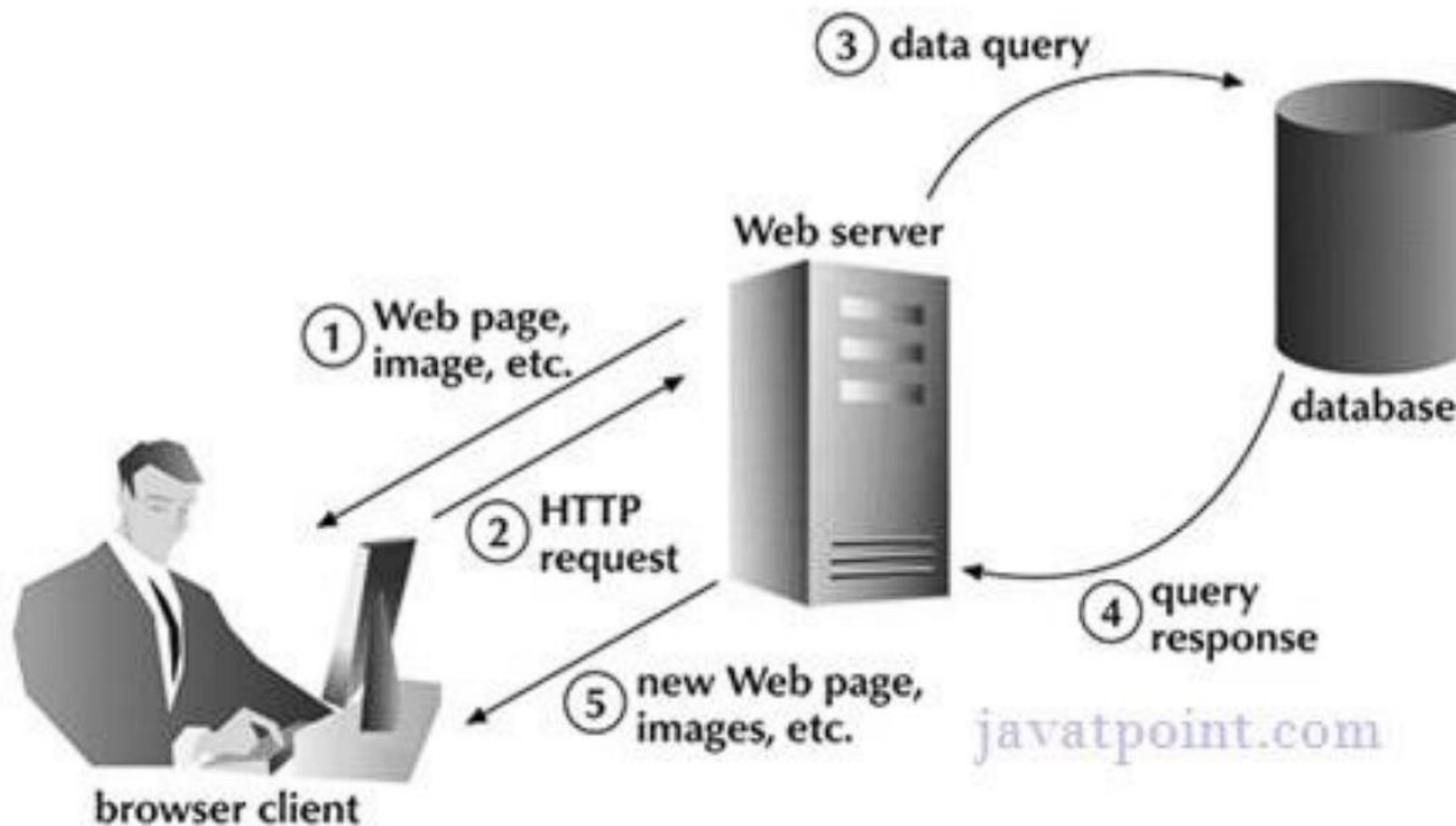
Understanding Synchronous vs Asynchronous

- 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 image, full page is refreshed at request time and user is blocked until request completes.

Understanding Synchronous vs Asynchronous

AJAX Technologies

- As describe earlier, ajax is not a technology but group of inter-related technologies.

- AJAX technologies includes:
  - HTML/XHTML and CSS
  - DOM
  - XML or JSON
  - XMLHttpRequest
  - JavaScript

Understanding XMLHttpRequest

- 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.

Properties of XMLHttpRequest object

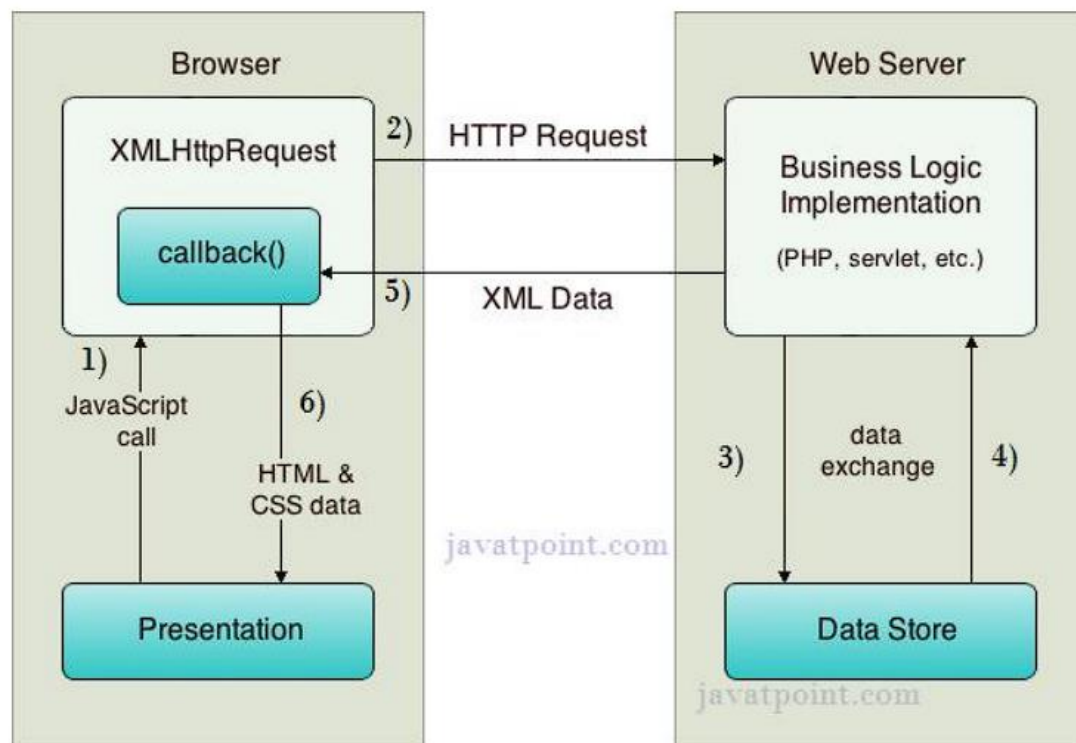| Property	Description
onReadyStateChange	It is called whenever readystate attribute changes. It must not be used with synchronous requests.
readyState	represents the state of the request ranges from 0 to 4. 0 : UNOPENED open() is not called. 1 : OPENED open is called but send() is not called. 2 : HEADERS_RECEIVED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

Methods of XMLHttpRequest object

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

How AJAX works

Let's try to understand the flow of ajax or how ajax works by the image displayed.

As you can see 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 Example

JS File

```
function fun1()
{
var a;
a=new XMLHttpRequest();
a.onreadystatechange=function()
{
    if (a.readyState==4 && a.status==200)
    {
        document.getElementById("myDiv").innerHTML=a.responseTe
    xt;
    }
}
a.open("POST","abc.txt",true);
a.send();
}
```

HTML File

```
<html>
<head>
<script type="text/javascript" src="JS File
Path"></script>
<div id="myDiv" style="width: 300px; height:
30px;">Click on the button below</div> <button
type="button" onclick="fun1()">Change
Content</button>
</body>
</html>
```