

AJAX

AJAX is an acronym for **Asynchronous JavaScript and XML**. AJAX is a new technique for creating better, faster and interactive web applications with the help of JavaScript, DOM, XML, HTML, CSS etc. AJAX allows you to send and receive data asynchronously without reloading the entire 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 is the most viable Rich Internet Application(RIA) technique so far.

Where it is used?

There are too many web applications running on the web that are using AJAX Technology. Some

are

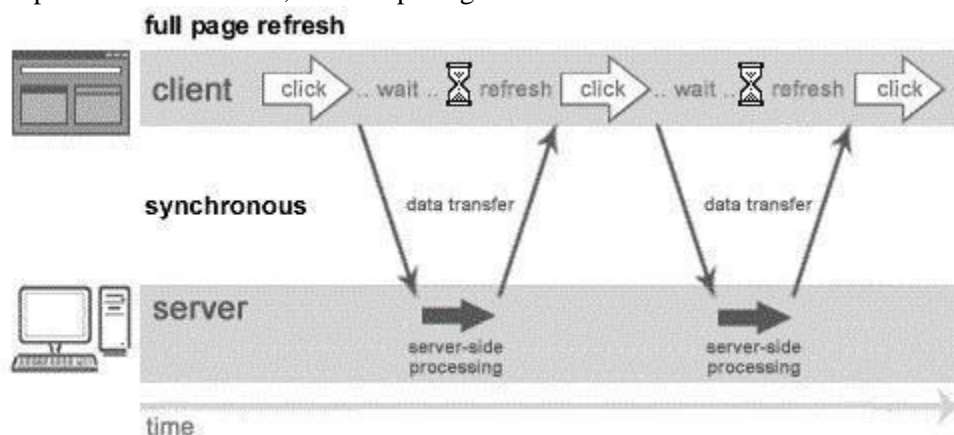
- : 1. Gmail
- 2. Face book
- 3. Twitter
- 4. Google maps
- 5. YouTube etc.,

Synchronous Vs. Asynchronous Application

Before understanding AJAX, let's understand classic web application model and AJAX Web application model.

❖ **Synchronous (Classic Web-Application Model)**

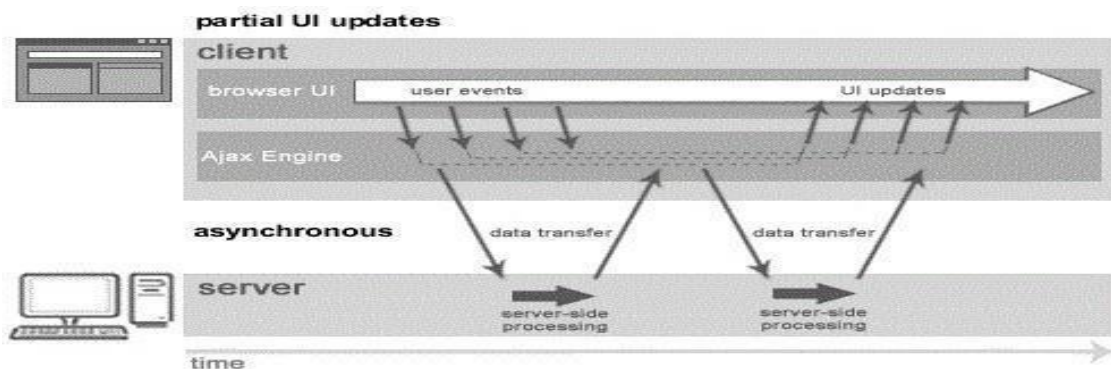
A synchronous request blocks the client until operation completes i.e. browser is not unresponsive. In such case, JavaScript Engine of the browser is blocked.



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

❖ **Asynchronous (AJAX Web-Application Model)**

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



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 Components

AJAX is not a technology but group of inter-related technologies. AJAX Technologies includes:

- ❖ HTML/XHTML and CSS
- ❖ DOM
- ❖ XML or JSON(JavaScript Object Notation)
- ❖ XMLHttpRequest Object
- ❖ JavaScript

- **HTML/XHTML and CSS**

These technologies are used for displaying content and style. It is mainly used for presentation.

- **DOM**

It is used for dynamic display and interaction with data.

- **XML or JSON(JavaScript Object Notation)**

For carrying data to and from server. JSON is like XML but short and faster than XML.

- **XMLHttpRequest Object**

For asynchronous communication between client and server.

- **JavaScript**

It is used to bring above technologies together. Independently, it is used mainly for client-side validation.

Understanding XMLHttpRequest

It is the heart of AJAX technique. An object of XMLHttpRequest is used for asynchronous communication between client and server. It provides a set of useful methods and properties that are used to send HTTP Request to and retrieve data from the web 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.

- **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)	Sends POST request.
setRequestHeader(header,value)	It adds request headers.

Syntax of open() method:

`xmlHttp.open("GET","conn.php",true);` which takes three attributes

1. An HTTP method such as GET ,POST , or HEAD
2. The URL of the Server resource
3. A boolean Flag that indicates whether the request should be asynchronously(true) or synchronously(false)

Properties of XMLHttpRequest Object:

Property	Description
readyState	Represents the state of the request. It ranges from 0 to 4. 0 UN INITIALIZED – After creating XMLHttpRequest Object before calling <i>open()</i> method. 1 CONNECTION ESTABLISHED – <i>open()</i> is called but <i>send()</i> is not called. 2 REQUEST SENT - <i>send()</i> is called. 3 PROCESSING - Downloading data; <i>responseText</i> holds the data. 4 DONE - The operation is completed successfully.
onReadyStateChange	It is called whenever <i>readyState</i> attribute changes. It must not be used with synchronous requests.
responseText	Returns response as TEXT.
responseXML	Returns response as XML

How AJAX Works?

AJAX communicates with the server using XMLHttpRequest object. Let's understand the flow of AJAX with the following figure:

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.

