



Web Technology (KCS-602)

Unit 3

Introduction to AJAX

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Ajax

- AJAX stands for **A**ynchronous **J**avaScript and **X**ML. AJAX is a new technique for creating better, faster, and more interactive web applications with the help of XML, HTML, CSS and Java Script.
- Ajax uses XHTML for content and CSS for presentation, as well as the Document Object Model and JavaScript for dynamic content display.
- Conventional web application transmit information to and from the sever using synchronous requests. This means you fill out a form, hit submit, and get directed to a new page with new information from the server.

Technologies Used in AJAX

JavaScript

- Loosely typed scripting language
- JavaScript function is called when an event in a page occurs
- Glue for the whole AJAX operation

DOM

- API for accessing and manipulating structured documents
- Represents the structure of XML and HTML documents

CSS

- Allows for a clear separation of the presentation style from the content and may be changed programmatically by JavaScript

XMLHttpRequest

- JavaScript object that performs asynchronous interaction with the server

AJAX Examples

Google Maps

- A user can drag the entire map by using the mouse instead of clicking on a button or something
- <http://maps.google.com/>

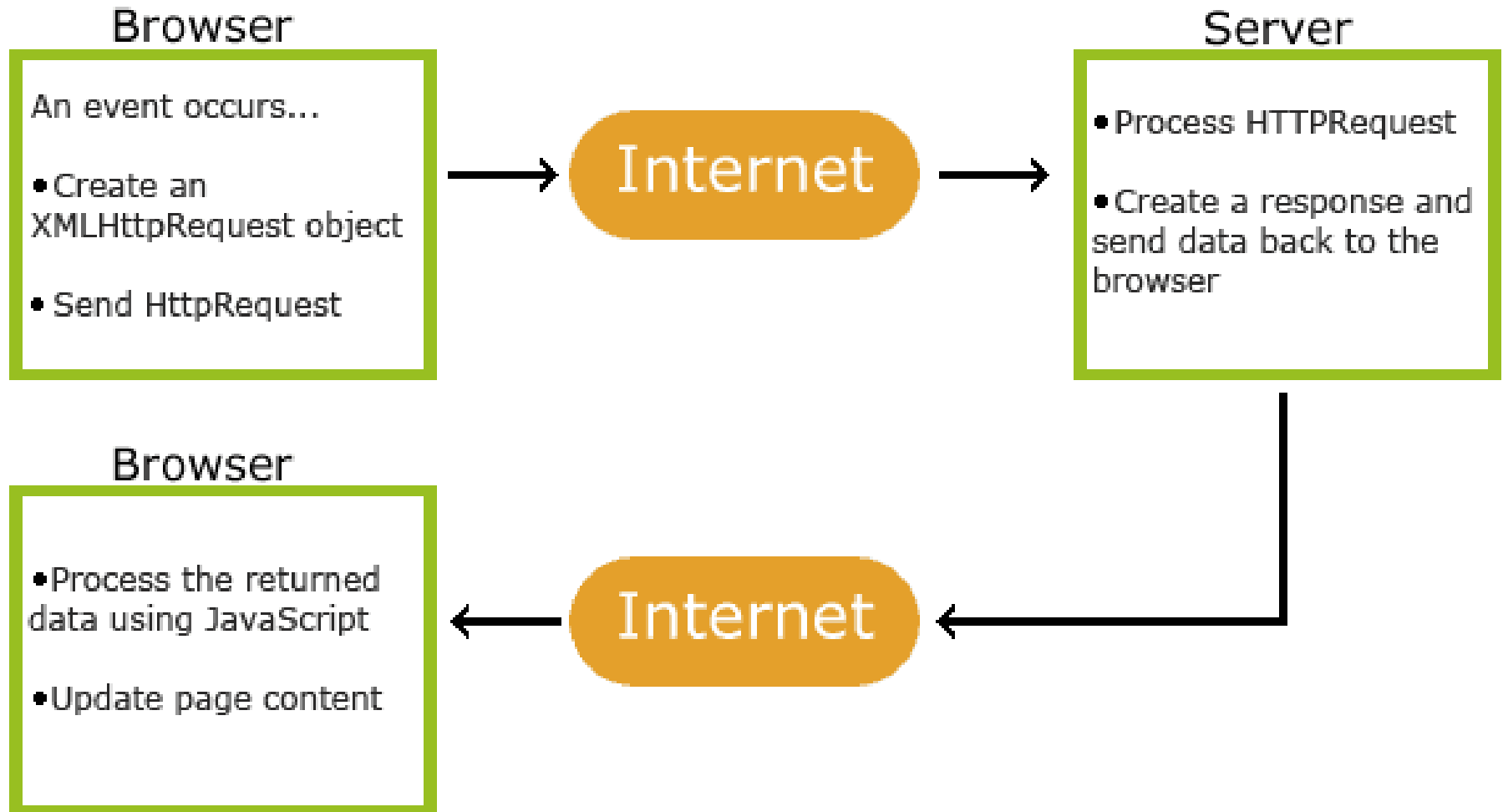
Google Suggest

- As you type, Google will offer suggestions. Use the arrow keys to navigate the results
- <http://www.google.com/webhp?complete=1&hl=en>

Gmail

- Gmail is a new kind of webmail, built on the idea that email can be more intuitive, efficient and useful
- <http://gmail.com/>

How AJAX Works



Steps of AJAX Operation

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

XMLHttpRequest

- The XMLHttpRequest object is the key to AJAX. It has been available ever since Internet Explorer 5.5 was released in July 2000, but not fully discovered before people started to talk about AJAX and Web 2.0 in 2005.
- XMLHttpRequest (XHR) is an API that can be used by JavaScript, JScript, VBScript and other web browser scripting languages to transfer and manipulate XML data to and from a web server using HTTP, establishing an independent connection channel between a web page's Client-Side and Server-Side.

XMLHttpRequest Methods

abort()

Cancels the current request.

getAllResponseHeaders()

Returns the complete set of HTTP headers as a string.

open(method, URL, async, userName, password)

Specifies the method, URL, and other optional attributes of a request.

send(content)

Sends the request.

XMLHttpRequest Properties

- **onreadystatechange**

An event handler for an event that fires at every state change.

- **readyState**

The readyState property defines the current state of the XMLHttpRequest object.

- **responseText**

Returns the response as a string.

- **responseXML**

Returns the response as XML. This property returns an XML document object, which can be examined and parsed using W3C DOM node tree methods and properties.

- **status**

Returns the status as a number (e.g. 404 for "Not Found" and 200 for "OK").

- **statusText**

Returns the status as a string (e.g. "Not Found" or "OK").

Current Issues with AJAX

Complexity is increased

- Server side developers will need to understand that presentation logic will be required in the HTML client pages as well as in the server-side logic
- Page developers must have JavaScript technology skills

AJAX-based applications can be difficult to debug, test, and maintain

- JavaScript is hard to test - automatic testing is hard
- Weak modularity in JavaScript
- Lack of design patterns or best practice guidelines yet

Toolkits/Frameworks are not mature yet

- Most of them are in beta phase

No standardization of the XMLHttpRequest yet

- Future version of IE will address this

No support of XMLHttpRequest in old browsers

- Iframe will help

JavaScript technology dependency & incompatibility

- Must be enabled for applications to function
- Still some browser incompatibilities

JavaScript code is visible to a hacker

- Poorly designed JavaScript code can invite security problem