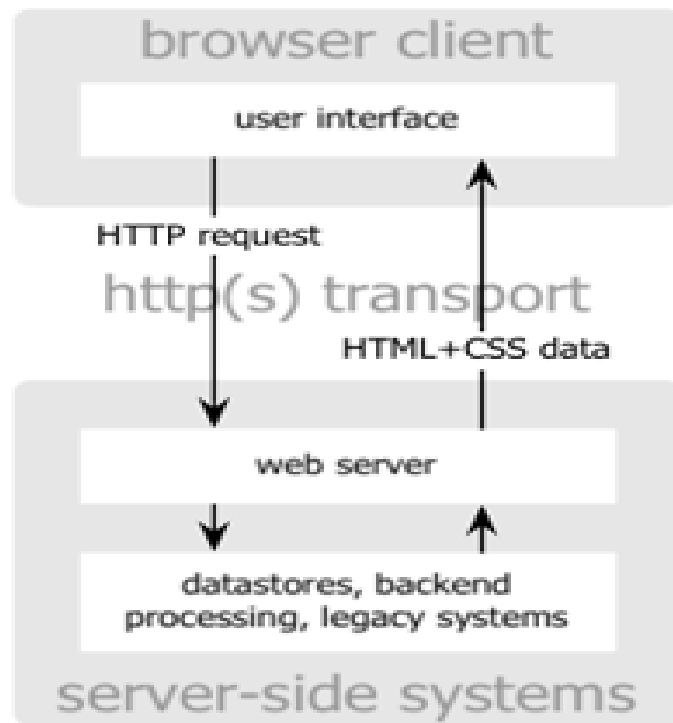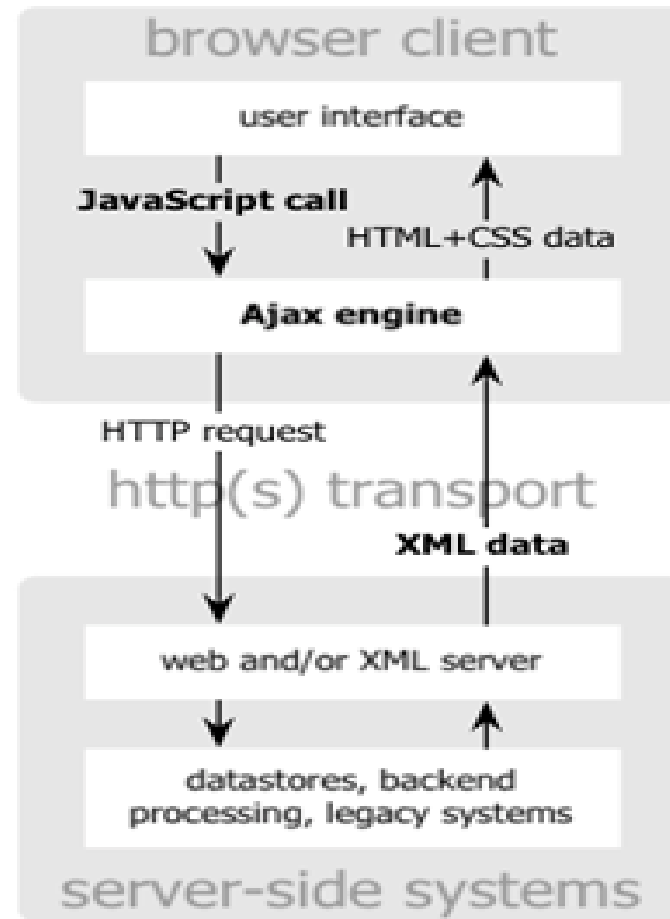# Ajax!

~~ **Shashank Daté** ~~
~~ **Troy Landers** ~~

What is Ajax

- **standards-based presentation using XHTML and CSS**
- **dynamic display and interaction using the Document Object Model**
- **data interchange and manipulation using XML and XSLT**
- **asynchronous data retrieval using XMLHttpRequest**
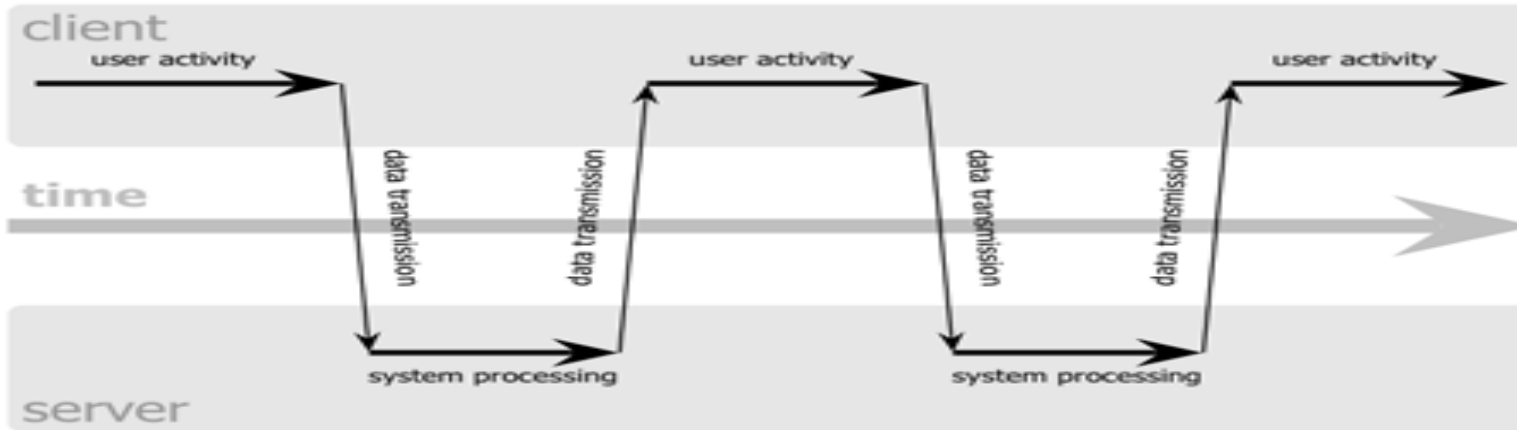- **and JavaScript binding everything together**

Classic vs. Ajax

classic web application model

browser client
- user interface

HTTP request
http(s) transport
HTML+CSS data

- web server

- datastores, backend processing, legacy systems

server-side systems

Ajax web application model

browser client
- user interface

JavaScript call / HTML+CSS data

- Ajax engine

HTTP request
http(s) transport
XML data

- web and/or XML server

- datastores, backend processing, legacy systems

server-side systems
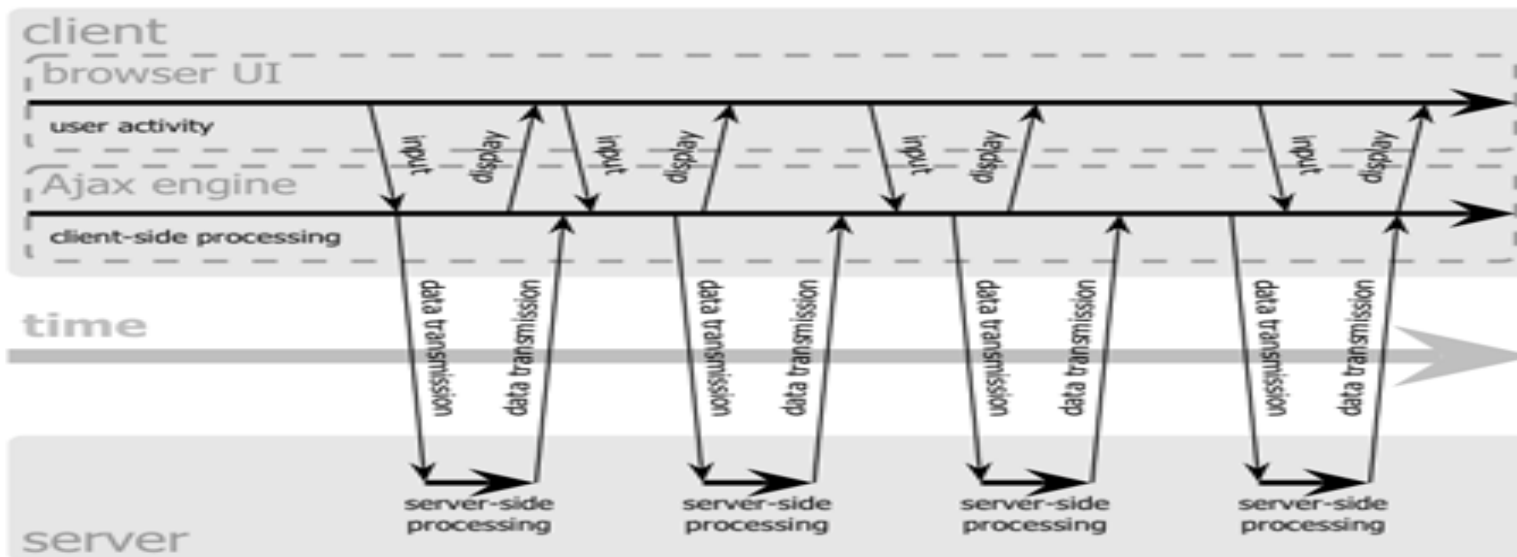
Async Communication

classic web application model (synchronous)

Ajax web application model (asynchronous)

Ajax Architecture

Ajaxian Web Frameworks

Rails, Tapestry, WebWork, ASP.NET, ...

UI Toolkit

Dojo, SmartClient, Backbase, Scriptaculous...

Remoting Toolkit

DWR, JSON-RPC, dojo.io.bind(), Prototype

XMLHttpRequest

iframe

...

JavaScript
Utilities
& Tools

Examples of AJAX

- **GMail**
- **Google Maps**
- **Google Suggest**
- **Flickr**

Is it new?

- **Not Really**

- **Hidden Frames**
  - **IE5+, Mozilla 1.0+, Safari 1.2+, and Opera 7.6+**

- **Java**
  - **Applets**

Why is it popular?

- **Google helped popularize, and legitimize it in GMail**
- **Increase Usability of Web Applications**
- **Rich Internet Applications without Flash**
- **Save Bandwidth**
- **Download only data you need**
- **Faster interfaces (sometimes)**

Why is it bad?

- **Breaks back button support**
- **URL's don't change as state changes**
- **Cross Browser Issues can be a pain**
- **JavaScript may tax older machines CPU**
- **Can't access domains other than the calling domain**
- **May be disabled (for security reasons) or not available on some browsers**
- **Debugging is difficult**

XMLHttpRequest

- **A JavaScript Class that lets you make asynchronous HTTP requests from JavaScript**

- **Make an HTTP request from a JavaScript event**

- **A call back JavaScript function is invoked at each state of the HTTP request and response**

XMLHttpRequest Properties

- **onreadystatechange - call back function for state changes**
- **readyState - the current state of the HTTP call**
- **responseText - the text result of the request**
- **responseXML - DOM xml object from the request**
- **status - HTTP status code of the response**
- **statusText - HTTP status text**

XMLHttpRequest Example

```javascript
if (window.XMLHttpRequest) {
    var req = new XMLHttpRequest();
    req.onreadystatechange =
    requestStateHandler;
    req.open("GET", "/somefile.xml", true);
    req.send("");
}
function requestStateHandler() {
    if (req.readyState == 4) { //response ready
        alert(req.statusText);
    }
}
```

IE does it differently

- **The above example however won't work on IE**

req = new ActiveXOjbect("Microsoft.XMLHTTP");

- **You can't totally blame them because they invented it**

- **Native XMLHttpRequest support should be in IE7**

Cross Browser AJAX

```
var req;
function loadXMLDoc(url) {
    req = false;
    // branch for native XMLHttpRequest object
    if(window.XMLHttpRequest) {
        try {
            req = new XMLHttpRequest();
        } catch(e) {
            req = false;
        }
        // branch for IE/Windows ActiveX version
    } else if(window.ActiveXObject) {
        try {
            req = new ActiveXObject("Msxml2.XMLHTTP");
        } catch(e) {
            try {
                req = new ActiveXObject("Microsoft.XMLHTTP");
            } catch(e) {
                req = false;
            }
        }
    }
    if(req) {
        req.onreadystatechange = processReqChange;
        req.open("GET", url, true);
        req.send("");
    }
}
```

Flash vs AJAX

- **No plugin for AJAX**
- **Flash development tools cost money**
- **Flash typically has slower page load time**
- **Flash can work on older browsers**
- **ActionScript doesn't havea cross browser issues**
- **Flash can access other domains if there is a crossdomain.xml file**

Basic Ajax Example

See step1-4.html, and doc.xml.

1. Create web page.

2. Create method to get XMLHttpRequest object.

3. Write handler function.

4. Put it all together.

Acknowledgements

Some information and diagrams from:

- http://www.adaptivepath.com/publications/essays/archives/000385.php
- http://www.petefreitag.com/item/514.cfm