

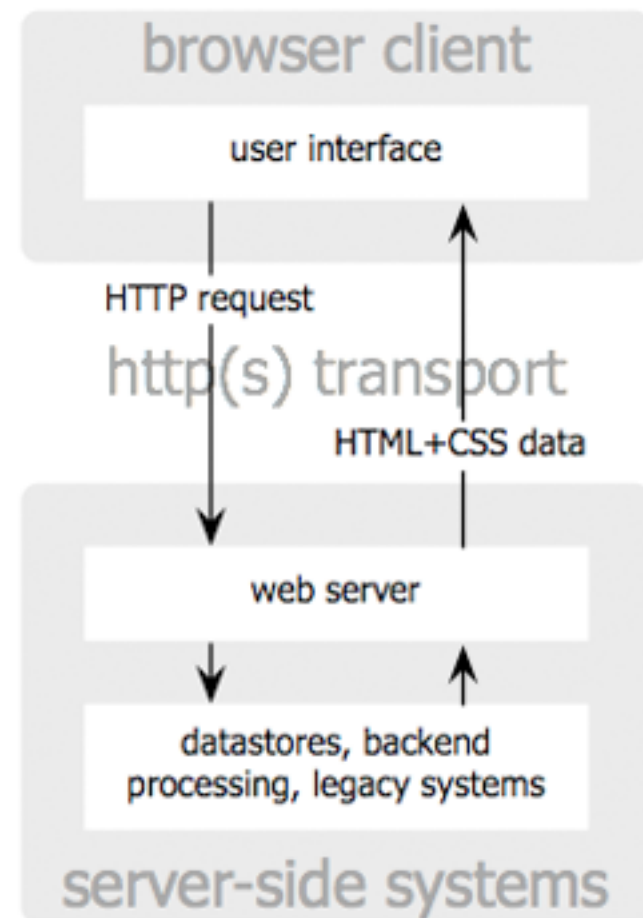
Ajax

**Ajax** (also **AJAX**; pronounced /ˈeɪdʒæks/; an acronym for **[Asynchronous JavaScript and XML](#)**<sup>[1]</sup> is a group of interrelated [web development](#) methods used on the [client-side](#) to create asynchronous [web applications](#). With Ajax, web applications can send data to, and retrieve data from, a [server](#) asynchronously (in the background) without interfering with the display and behavior of the existing page. Data is usually retrieved using the [XMLHttpRequest object](#). Despite the name, the use of XML is not needed ([JSON](#) is often used instead), and the requests do not need to be [asynchronous](#).<sup>[2]</sup>

Ajax is not one technology, but a group of technologies. [HTML](#) and [CSS](#) can be used in combination to mark up and style information. The [DOM](#) is accessed with JavaScript to dynamically display, and to allow the user to interact with the information presented. JavaScript and the XMLHttpRequest object provide a method for exchanging data asynchronously between browser and server to avoid full page reloads.

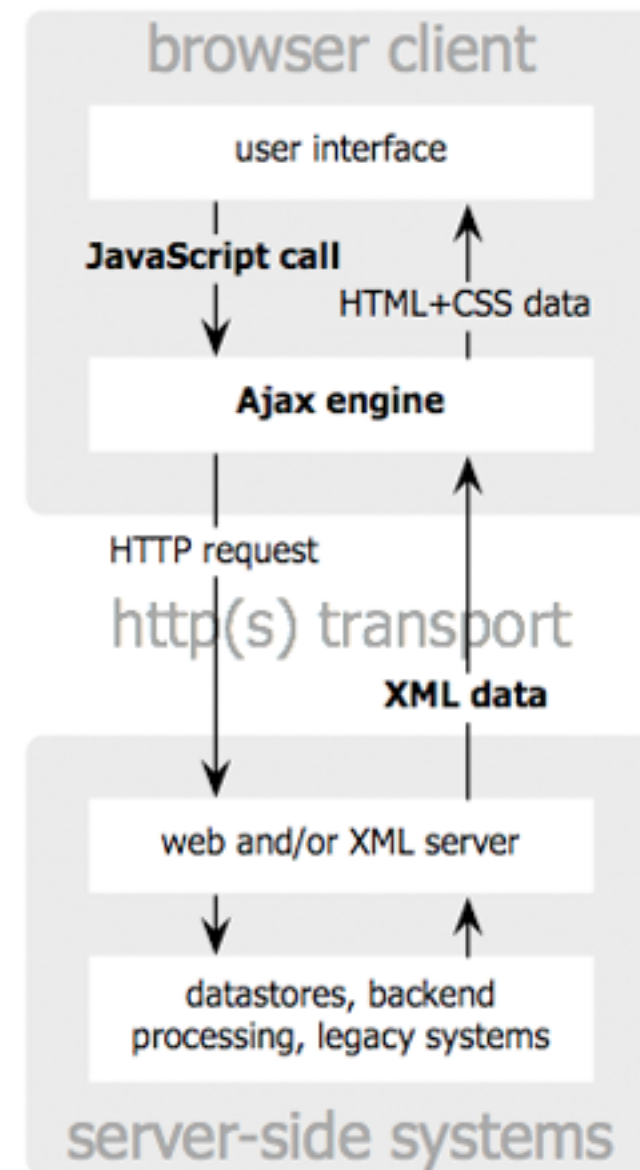


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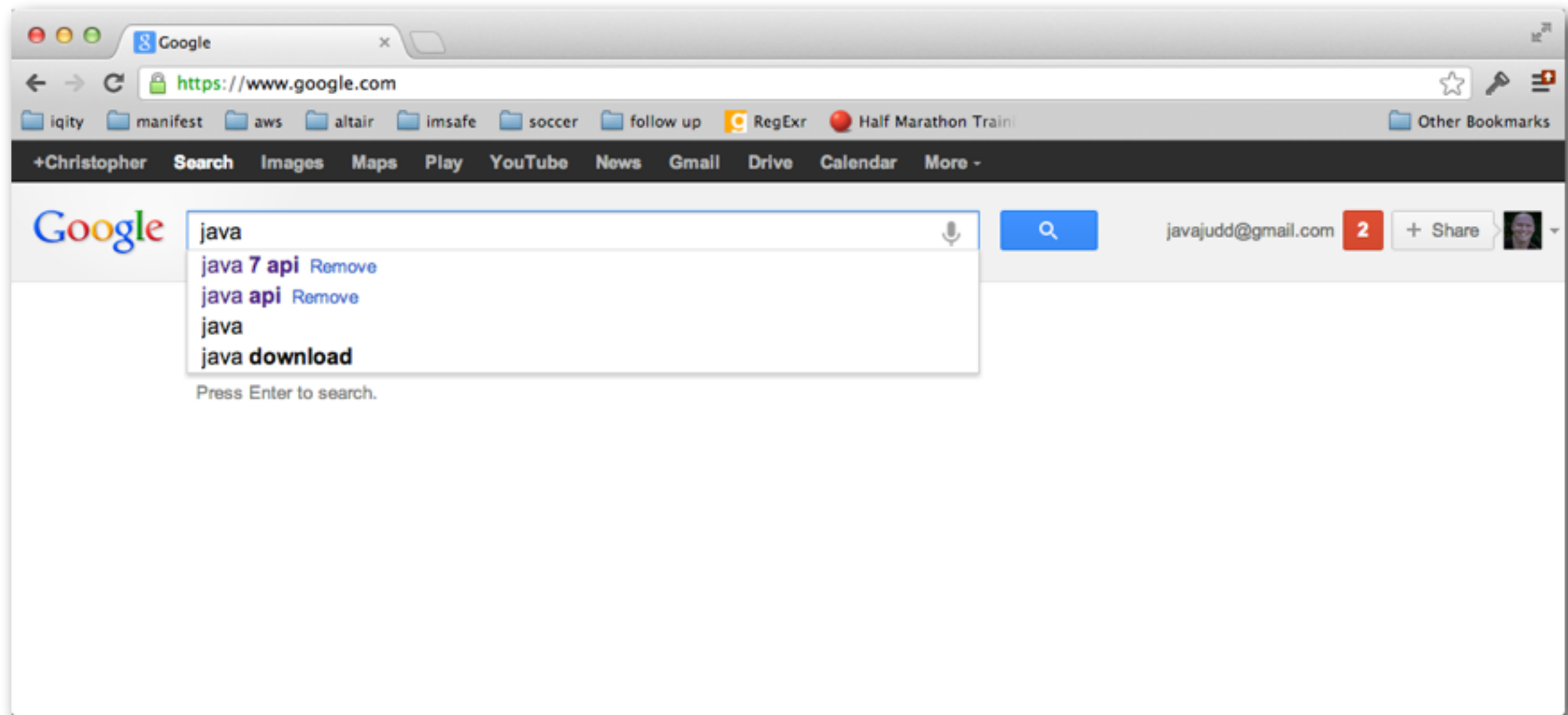
**classic  
web application model**

Jesse James Garrett / adaptivepath.com



**Ajax  
web application model**

# auto complete



# results

A screenshot of a Google search results page for the query "java". The browser window shows the address bar with the URL "https://www.google.com/#hl=en&output=search&client=psy-ab&q=java&oq=java&gs\_l=hp.3..35i39l2j0l2.15924.17557.0.69269.4.4.0.0....". The search bar contains the text "java". The page displays 130 personal results and 828,000,000 other results. The top result is from java.com, titled "Java + You", with a description: "Get the latest Java Software and explore how Java technology provides a better digital experience." Below this are four links: "Download", "What is Java?", "Test whether Java is working", and "What is Java Update?". The second result is from Oracle Technology Network for Java Developers, titled "Oracle Technology Network for Java Developers", with a description: "Feb 21, 2013 – Beta testing for part one of the Java EE 6 Enterprise Architect Certified Master exam is now underway. Learn how you can save big during the ...". The third result is from Wikipedia, titled "Java (software platform) - Wikipedia, the free encyclopedia", with a description: "Java is a set of several computer software products and specifications from Sun".

java - Google Search

https://www.google.com/#hl=en&output=search&client=psy-ab&q=java&oq=java&gs\_l=hp.3..35i39l2j0l2.15924.17557.0.69269.4.4.0.0....

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[Oracle Technology Network for Java Developers](#)  
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[en.wikipedia.org/wiki/Java\\_\(software\\_platform\)](#)  
**Java** is a set of several computer software products and specifications from Sun



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### Net Frog

User Rating: ★★★★★

Url: <http://frog.edschool.virginia.edu/>

**Description:** This website provides students with detailed diagrams and a step-by-step approach that guides them during the dissection of a frog. It also gives students a virtual alternative to the actual dissection of a frog, as well as a review for those who have already completed the dissection. It would also be beneficial for use by anatomy teachers or those wishing to investigate various systems of the frog's body. For teachers unfamiliar with safety precautions, as well as other dissection-related issues, it would be helpful to read through the NSTA's guidelines for 'Responsible Use of Live Animals and Dissection in the Science Classroom.' in the ORC database. This content resource aligns with Ohio's Life Science standards for grades 6-8. QuickTime is required to view the diagrams. (cb)

**Resource Type:** Content Supports**Discipline:** Science**Grades:** 6, 7, 8, 9, 10[Show Aligned Standards](#)

# CRUD

HTTP	CRUD	SQL
put	create	insert
get	read	select
post	update	update
delete	delete	delete

# XMLHttpRequest Object

```
var xhr;
if(window.XMLHttpRequest) {
    xhr = new XMLHttpRequest();
} else if (window.ActiveXObject) {
    xhr = new ActiveXObject("Microsoft.XMLHTTP");
}

xhr.onreadystatechange = function () {
    if(xhr.readyState == 4) {
        if(xhr.status == 200) {
            alert(xhr.responseText);
        }
    }
}

xhr.open(
    "GET",
    "number?max=" + encodeURIComponent(10),
    true
);

xhr.send(null);
```



# jQuery

```
$(document).ready(function() {  
  
    $("#jquery-button").click(function() {  
        var max = $('#jquery-max').val();  
  
        $.get('number', {max:max}, function(data) {  
            $('#jquery-number').html(data);  
        });  
  
    });  
});
```

# JSON

```
{
  "title": "Recent Uploads tagged mountrainier",
  "link": "http://www.flickr.com/photos/tags/mountrainier/",
  "description": "",
  "modified": "2013-03-05T06:15:36Z",
  "generator": "http://www.flickr.com/",
  "items": [
    {
      "title": "Three volcanoes.",
      "link": "http://www.flickr.com/photos/urbanadventureleaguepdx/8529486681/",
      "media": {"m": "http://farm9.staticflickr.com/8367/8529486681_362bc972f8_m.jpg"},
      "date_taken": "2013-03-04T15:26:19-08:00",
      "published": "2013-03-05T06:15:36Z",
      "author": "nobody@flickr.com (urbanadventureleaguepdx)",
      "author_id": "63964930@N05",
      "tags": "mountrainier mountsthelens mountadams"
    },
    {
      "title": "Flew home to a sunny day.",
      "link": "http://www.flickr.com/photos/architecturegeek/8530441688/",
      "media": {"m": "http://farm9.staticflickr.com/8383/8530441688_07f87db69f_m.jpg"},
      "date_taken": "2013-03-04T15:03:38-08:00",
      "published": "2013-03-05T03:39:39Z",
      "author": "nobody@flickr.com (architecturegeek)",
      "author_id": "42788598@N00",
      "tags": "seattle sky air aerial mountrainier mtrainier airplanewindow virginamerica"
    }
  ]
}
```

# jQuery (JSON)

```
$.getJSON('ajax/test.json', function(data) {  
    var items = [];  
  
    $.each(data, function(key, val) {  
        items.push('<li id="' + key + '">' + val + '</li>');  
    });  
  
    $('<ul/>', {  
        'class': 'my-new-list',  
        html: items.join('')  
    }).appendTo('body');  
});
```

cross site scripting

JSONP

# cross site scripting

## JSONP

```
<!DOCTYPE html>
<html>
<head>
  <title>JSONP Example</title>
  <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.9.1/jquery.min.js"></script>
</head>
<body>
  <div id="images">
  </div>

  <script>
$.getJSON("http://api.flickr.com/services/feeds/photos_public.gne?jsoncallback=?",
{
  tags: "mount rainier",
  tagmode: "any",
  format: "json"
},
function(data) {
  $.each(data.items, function(i,item){
    $("<img/>").attr("src", item.media.m).appendTo("#images");
    if ( i == 3 ) return false;
  });
});</script>

</body>
</html>
```

# cross site scripting

## JSONP

```
{
  "title": "Recent Uploads tagged mountrainier",
  "link": "http://www.flickr.com/photos/tags/mountrainier/",
  "description": "",
  "modified": "2013-03-05T06:15:36Z",
  "generator": "http://www.flickr.com/",
  "items": [
    {
      "title": "Three volcanoes.",
      "link": "http://www.flickr.com/photos/urbanadventureleaguepdx/8529486681/",
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      "date_taken": "2013-03-04T15:26:19-08:00",
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      "tags": "mountrainier mountsthelens mountadams"
    },
    {
      "title": "Flew home to a sunny day.",
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      "published": "2013-03-05T03:39:39Z",
      "author": "nobody@flickr.com (architecturegeek)",
      "author_id": "42788598@N00",
      "tags": "seattle sky air aerial mountrainier mtrainier airplanewindow virginamerica"
    }
  ]
}
```

# cross site scripting

## JSONP

```
jQuery191038457776024006307_1362672677064({
  "title": "Recent Uploads tagged mountrainier",
  "link": "http://www.flickr.com/photos/tags/mountrainier/",
  "description": "",
  "modified": "2013-03-05T06:15:36Z",
  "generator": "http://www.flickr.com/",
  "items": [
    {
      "title": "Three volcanoes.",
      "link": "http://www.flickr.com/photos/urbanadventureleaguepdx/8529486681/",
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      "author_id": "63964930@N05",
      "tags": "mountrainier mountsthelens mountadams"
    },
    {
      "title": "Flew home to a sunny day.",
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      "author_id": "42788598@N00",
      "tags": "seattle sky air aerial mountrainier mtrainier airplanewindow virginamerica"
    }
  ]
})
```

**CONTENTS INCLUDE:**

- Getting to Know HTTP
- Tips for Using XHR
- Ajax and Architecture
- Ajax Toolkits
- Ajax User Interfaces
- Hot Tips and more...

# Getting Started with **Ajax**

By Dave Crane

**GETTING STARTED**

The standard way to do Ajax is to use the XMLHttpRequest object, known as XHR by its friends. Use XHR directly, or via one of the helpful Ajax libraries such as Prototype or jQuery. How do we use XHR "by hand"? To start with, we need to get a reference to it:

```
if (window.XMLHttpRequest) {
    xhr = new XMLHttpRequest();
} else if (window.ActiveXObject) {
    xhr = new ActiveXObject("Microsoft.XMLHTTP");
}
```

We can then open a connection to a URL:

```
xhr.open(
    "GET",
    "my-dynamic-content.jsp?id="
    +encodeURIComponent(myId),
    true
);
```

Specify a callback function to receive the response:

```
xhr.onreadystatechange = function(){
    processReqChange(req);
}
```

and then send the request:

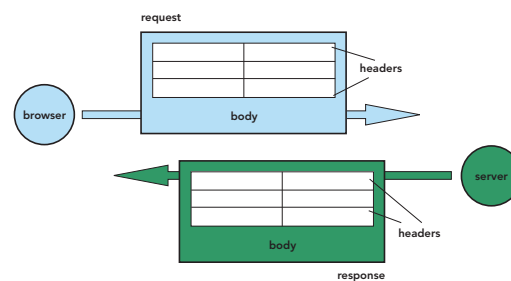
```
xhr.send(null);
```

The server may be busy, or the network may be slow. We don't want to sit around doing nothing until the response arrives, and because we've assigned the callback function, we don't have to. That's the five-minute guide for the impatient. For those who like to know the details, we've listed the fuller details of the XHR object below.

Method Name	Parameters and Descriptions
open(method, url, async)	open a connection to a URL method = HTTP verb (GET, POST, etc.) url = url to open, may include querystring async = whether to make asynchronous request
onreadystatechange	assign a function object as callback (similar to onclick, onload, etc. in browser event model)
setRequestHeader(name,value)	add a header to the HTTP request
send(body)	send the request body = string to be used as request body
abort()	stop the XHR from listening for the response
readyState	stage in lifecycle of response (only populated after send() is called)
httpStatus	The HTTP return code (integer, only populated after response reaches the loaded state)
responseText	body of response as a JavaScript string (only set after response reaches the interactive readyState)
responseXML	body of the response as a XML document object (only set after response reaches the interactive readyState)
getResponseHeader(name)	read a response header by name
getAllResponseHeaders()	Get an array of all response header names

**GETTING TO KNOW HTTP**

To make use of the XHR to its fullest, we recommend you become familiar with the workings of the HTTP protocol. Using Ajax, you have much more control over HTTP than with classic web app development.

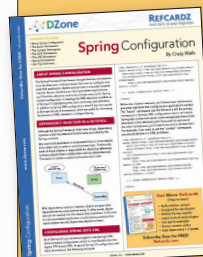


HTTP is a stateless request-response protocol.

- Both request and response contain headers and an optional body, which is free text.
- Only a POST request contains a body.
- A request defines a verb or method.
- The Mime type of request and response can be set by the header Content-type



**Not all Microsoft browsers rely on ActiveX.**  
IE7 provides a native JavaScript XHR, so we check for that first.



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