

AJaX: Old Dog New Tricks

Dave Johnson
Co-founder eBusiness Applications

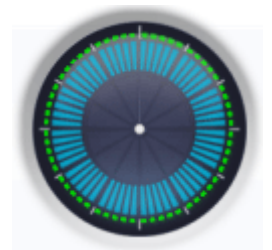
Oct 19, 2005

What is AJAX?

- Development pattern encompassing many different technologies
- Enables a new breed of web application

Overview

- *Motivation for AJaX*
- AJaX Defined
- Benefits of AJaX
- Technologies
- AJaX Problems
- The Future of the Rich Web



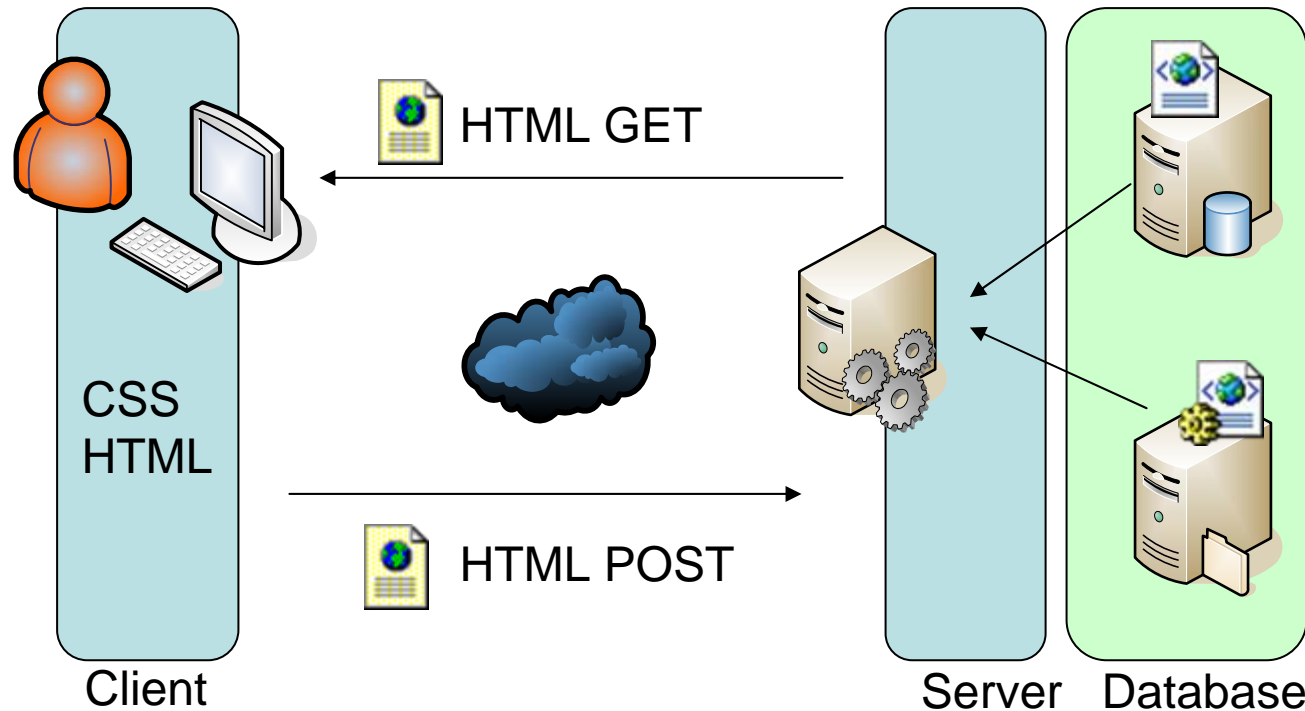
Web 1.0

- Web applications in 1999 were really something special



Traditional Web Application

- In the beginning there were web applications
- Easy to build ... pages are just static views

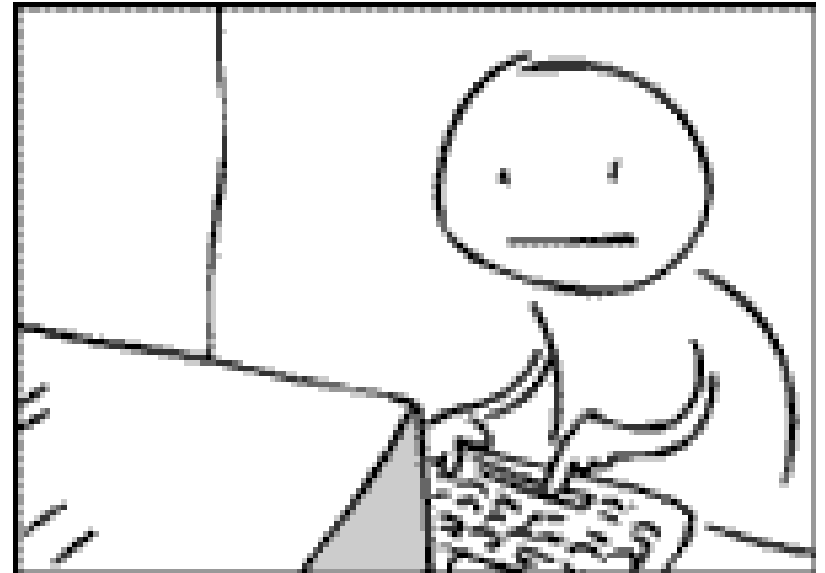


Happy Developers

- Life was good!
 - Fast to develop
 - Cheap to deploy
 - Easier to support
 - All the things that make Salesforce.com work (and what every other ASP was trying to sell)

Sad Users

- Eventually end users decided it wasn't all that great...
- Many companies and users reverted to old methods



Enter AJaX



Examples

Local

On the Web

Web 2.0 Renaissance



Circa 2000



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Solutions [More ▶](#)

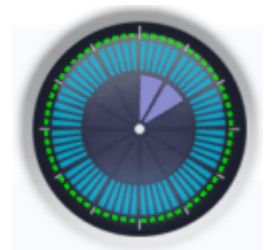
WebOS solutions are in a class of their own. If your enterprise is seeking the premium solution to managing and delivering your applications, data and content in the new distributed, wireless and device-centric computing era then you have come to the right place. [Come see what WebOS can do for you.](#)

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Username:

Password:

- Traditional Web Applications
- ***AJaX Defined***
- Benefits of AJaX
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In a Nutshell

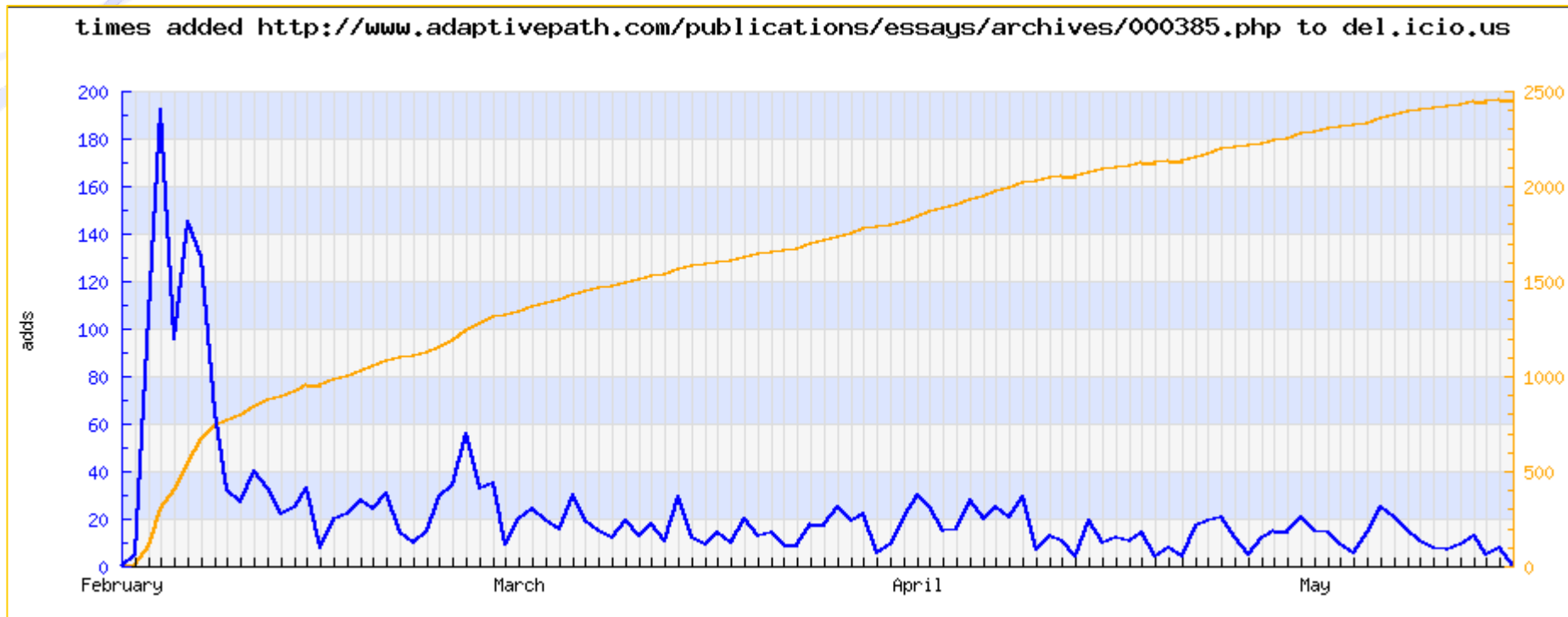
- A: Asynchronous
- Ja: JavaScript
- X: XML
- The father of AJaX
 - Jesse James Garrett
 - The definitive essay:



Feb 18, 2005 - <http://www.adaptivepath.com/publications/essays/archives/000385.php>

Resounding Success

- Number of time per day Adaptive Path essay tagged in del.icio.us**
- Total number of times tagged**



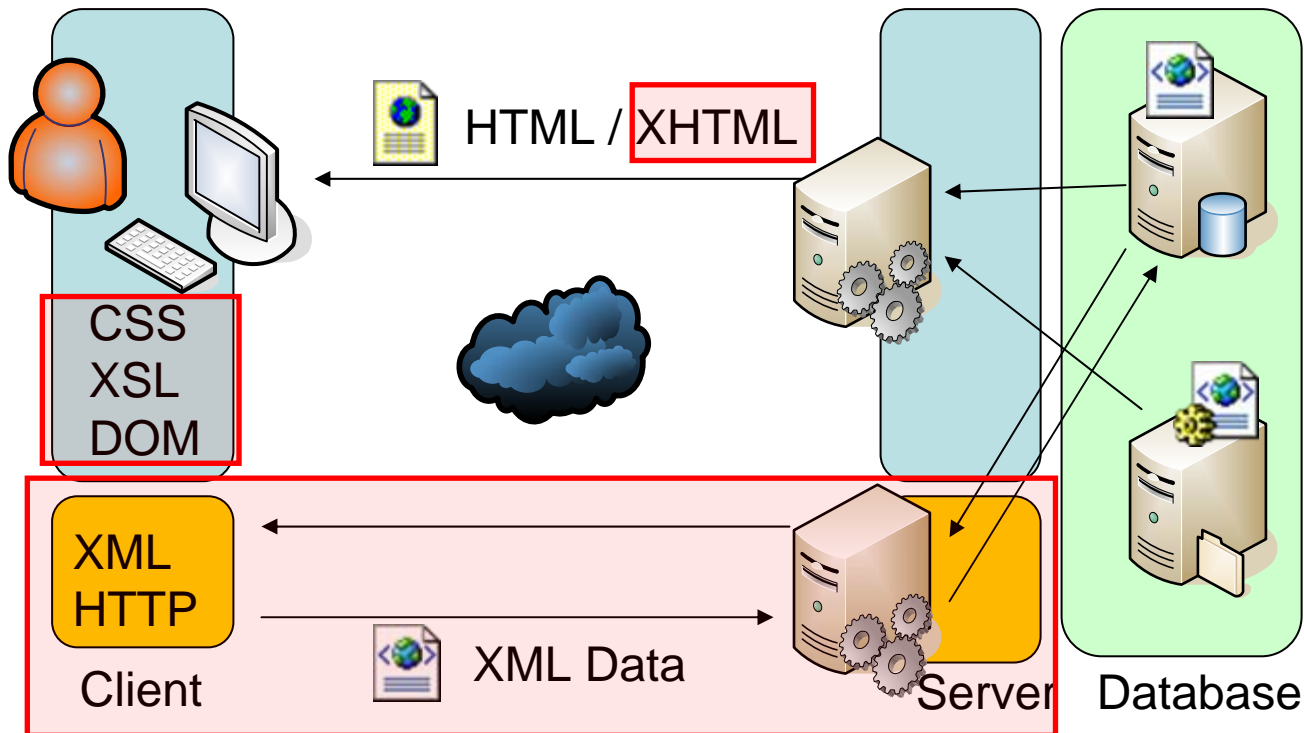
<http://www.neuroticweb.com/recursos/del.icio.us-graphs/>

AJaX Tag Cloud

[a href](#) [access](#) [action](#) [activex](#) [add](#) **ajax** [amazon](#) [apps](#) [asp net](#)
[asynchronous](#) [atlas](#) [autocomplete](#) [beta](#) [browser](#) [browser based](#) [browsers](#)
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AJaX Web Application

- Still MVC but controller spans the network
- ***Standards based rich internet applications***



Google Suggest

[Online](#)



Web [Images](#) [Groups](#) [News](#) [Froogle](#) [Local](#) [more »](#)

As you type, Google suggests:

ajax	
ajax	3,840,000 results
ajax amsterdam	502,000 results
ajax fc	710,000 results
ajax ontario	275,000 results
ajax grips	8,860 results
ajax football club	573,000 results
ajax public library	40,500 results
ajax football	454,000 results
ajax soccer	437,000 results
ajax pickering transit	10,700 results

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sults. [Learn more](#)

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Google Local [Web](#) [Images](#) [Groups](#) [News](#) [Froogle](#) **Local** [more »](#)

Search the map
e.g., "hotels near lax" or "10 market st, san francisco" [Find businesses](#)
[Get directions](#)

Local [Print](#) [Email](#) [Link to this page](#)

©2005 Google - Map data ©2005 NAVTEQ™ - Imagery ©2005 DigitalGlobe - Terms of Use

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Logged in as **bliggy** (1 new) | [Your Account](#) | [Help](#) | [Sign Out](#)

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33 photos | [Edit](#)



Central Europe 05

55 photos | [Edit](#)

100_0575



mmm fixie

(1 comment / 20 views)

This photo is **public** ([set privacy](#))

Uploaded on Sep 7, 2005 | [Delete](#)

100_0574



global whating??

(0 comments / 10 views)

This photo is **public** ([set privacy](#))

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[Edit these as a batch?](#)

Search by tag

Or, browse by...

- [Your tags](#)
- [Calendar](#)
- [Archives](#) (200 photos)

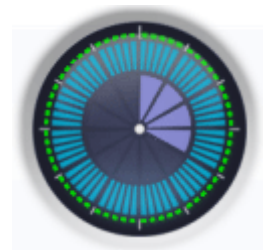
Your popular photos

- Most [views](#)
- Most "[favorited](#)"
- Most [comments](#)
- Most [interesting](#)

Your photostream has been viewed **491** times.

Share your photos

- Traditional Web Applications
- AJaX Defined
- ***AJaX***
- Technologies
- AJaX Problems
- The Future of the Rich Web



User Benefits

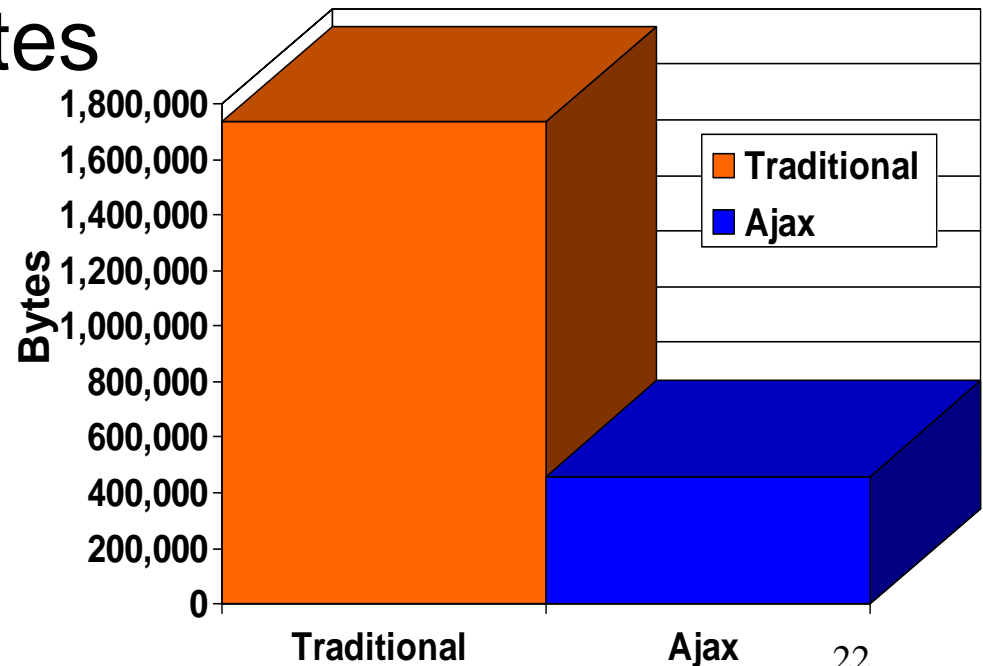
1. All about the page refresh
2. Low latency
 - Network
 - Browser
3. Seamless interactivity

Developer Benefits

1. Reduced server load
2. Reduced bandwidth
3. Increased performance
4. May even be easier to develop
 - Frameworks
 - Components

Example - Bandwidth

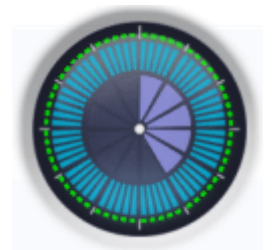
- Comparing traditional and AJaXian application
- Compare # of bytes for same action
- AJaX 73% more compact



What does AJaX mean to me?

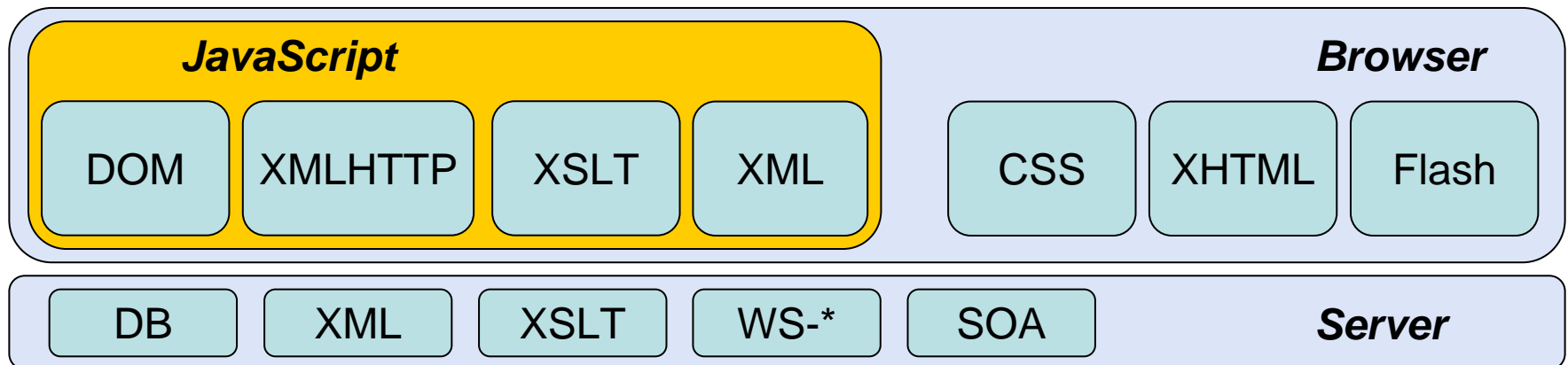
- ***Retrieve data behind the scenes to reduce application latency***
 - Server data validation
 - Master detail
 - Captured interactivity

- Traditional Web Applications
- AJaX Defined
- Benefits of AJaX
- *Technologies*
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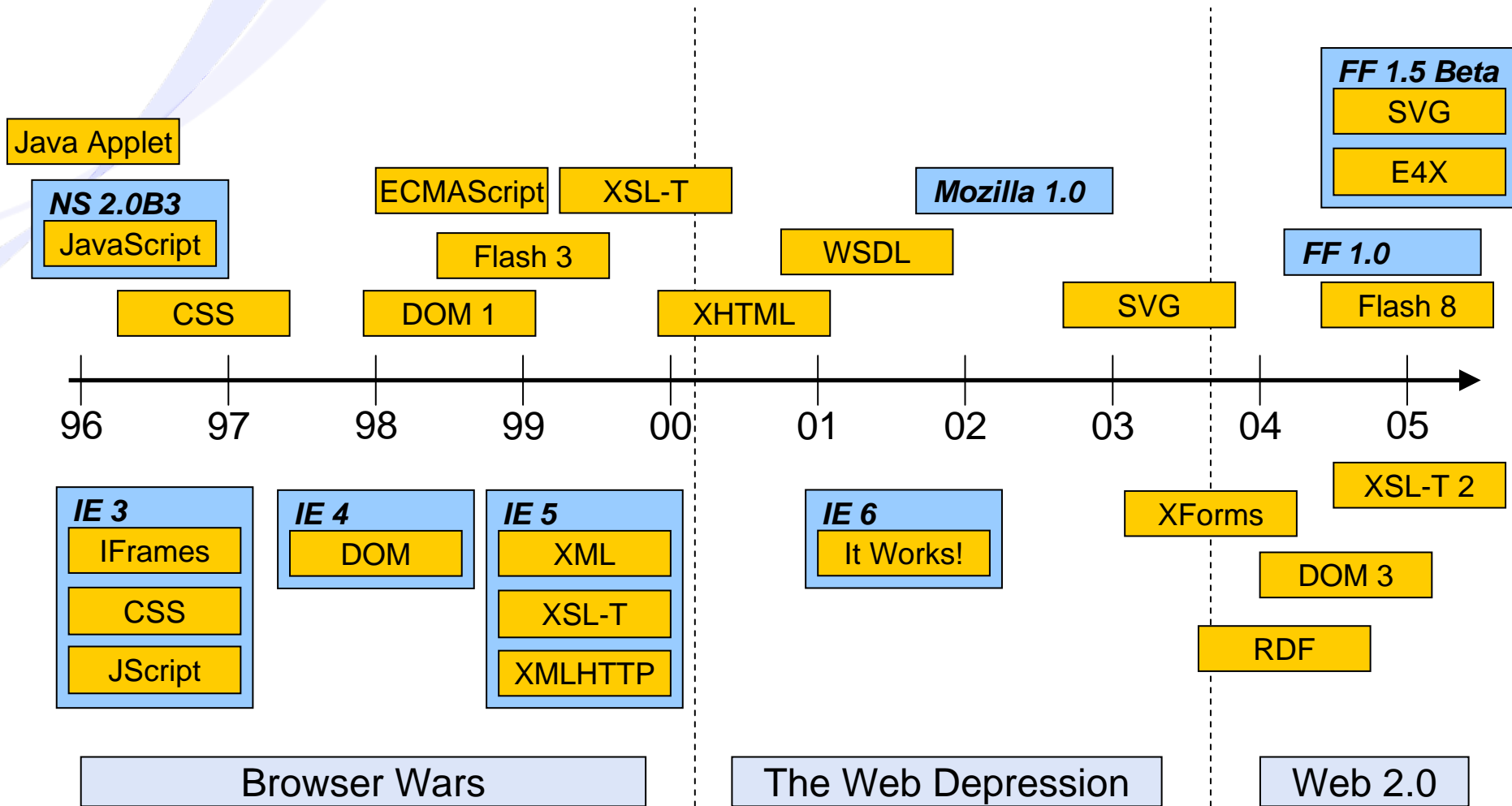


JavaScript

- “One script to bind them all”
- Where all the work gets done
- Generally has a bad rap
- It can be slow in the most popular browser



Back to the Future



Asynchronous HTTP

- Internet Explorer ActiveX object (will be native in IE7)
- Native object in Mozilla based browsers
- Browser dependent syntax

XmlHttpRequest (XHR)

```
// Load some data from a remote service
function loadRemoteXml(sUrl, fReady, v)
{
    if (window.XMLHttpRequest) {
        // branch for native XMLHttpRequest object
        req = new XMLHttpRequest();
        req.onreadystatechange = fReady;
        req.open("GET", sUrl, true);
        req.send(null);
    } else if (window.ActiveXObject) {
        // branch for IE/Windows ActiveX version
        req = new ActiveXObject("Msxml2.XMLHTTP." + version);
        req.onreadystatechange = fReady;
        req.open("GET", sUrl, true);
        req.send();
    }
}

// handle onreadystatechange event of req object
function processReqChange() {
    // only if req shows "loaded"
    if (req.readyState == 4) {
        // only if "OK"
        if (req.status == 200) {
            xData = req.responseXML;
            loadData(xData);
        } else {
            alert("There was a problem retrieving the XML data:\n" + req.statusText);
        }
    }
}
```

Data Formats

- XML
 - SOAP (bloated but Web Service oriented)
 - Plain old data (cross platform, compact, XSL, typed, etc)
- JavaScript Object Notation (JSON)

```
var myJSONObject = {"bindings": [  
    {"ircEvent":"PRIVMSG", "method":"newURI", "regex":"^http://.*"},  
    {"ircEvent":"PRIVMSG", "method":"deleteURI", "regex":"^delete.*"},  
    {"ircEvent":"PRIVMSG", "method":"randomURI", "regex":"^random.*"}  
  ]};  
myJSONObject.bindings[0].method // "newURI"
```

- JavaScript
 - Calls to client side methods

XML

- The “X” stands for XML

```
<subject>
  <you>
    <verb know="this">XML</verb>
  </you>
</subject>
```

- Encoded XML

```
<root key="Name | Company | Address">
  <e a="Foo" b="Bar" c="555 Sunnyside Drive" />
</root>
```

XSL-T

- Preferred method for working with XML based data
 - Available in many browsers
 - Standards based
 - Really fast
 - Runs on client or server
- No Opera support
 - Google AJaXSLT JavaScript library

XSL-T

```
function transformXml(xml, xslt, t)
{
    if(document.implementation.createDocument) {
        xslRef = new XSLTProcessor();
        // convert the XSL to a DOM object first
        var parser = new DOMParser();
        myXslStylesheet = parser.parseFromString(xslt, "text/xml");
        // attach the stylesheet; the required format is a DOM object
        xslRef.importStylesheet(myXslStylesheet);

        // do the transform (ownerDocument is the current HTML page you're on)
        var fragment = xslt.transformToFragment(xml, ownerDocument);
        // create a DOM container and insert offline
        var tmpBox = document.createElement("div");
        tmpBox.appendChild(fragment);
        return tmpBox.innerHTML;
    } else if (window.ActiveXObject) {
        // first create a DOM document and an XSLT template document
        var xslDoc = new ActiveXObject("Msxml2.FreeThreadingDOMDocument");
        var xslTemplate = new ActiveXObject("Msxml2.XSLTemplate");
        xslDoc.async = false;
        // load the stylesheet into the DOM document and attach to the template
        xslDoc.loadXML(xslt);
        xslTemplate.stylesheet = xslDoc;

        // get the rental-model XSLT processor object
        var xslProc = xslTemplate.createProcessor();
        // feed it the XML data and do the transform
        xslProc.input = xml;
        xslProc.transform();
        // grab the output, and insert into HTML document
        return xslProc.output;
    }
}
```


Document Object Model (DOM)

- Page manipulation
- Enables Dynamic HTML (DHTML)
 - Event model
 - Object model

```
function showData()  
{  
    // Get XML data in a cross browser manner  
    var oXml = getXml();  
    // Get XSL in a cross browser manner  
    var oXsl = getXsl();  
    // Transform the XML with the XSL in a cross browser manner  
    var nodeFragment = transformXml(oXml, oXsl);  
    // Get your end node and insert the fragment  
    var htmlNode = document.getElementById('myNode');  
    htmlNode.innerHTML = nodeFragment;  
}
```

Cascading StyleSheets (CSS)

- Separating content from style
 - `.className {color:red;}`
 - `#nodeId {color:blue;}`
 - `node[foo~="bar"] {color:green;}`
- Style applied depending on specificity of the selectors
- Refer to last VanX talk
 - <http://csszengarden.com/>

Other technologies

- IFrames
 - Oldest trick in the book
 - Graceful failure
- Java
 - Applets
 - Visual Studio 6 PageObject

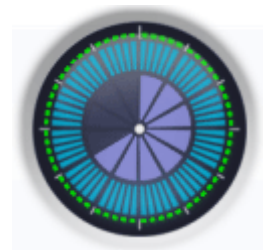
More

- Macromedia (Adobe) Flash
 - Nice for animation
 - Action Script
 - Can talk to JavaScript
 - FsCommands
 - Flash 8 it is native!
 - Has built in support for async server calls and XML

On the Server Side

- Any server platform you want
 - Java
 - .NET
 - PHP
- Web Services
- SQLXML (SQL Server, xStreamDB)
- Ruby on Rails

- Traditional Web Applications
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- ***AJaX Problems***
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AJaX Problems

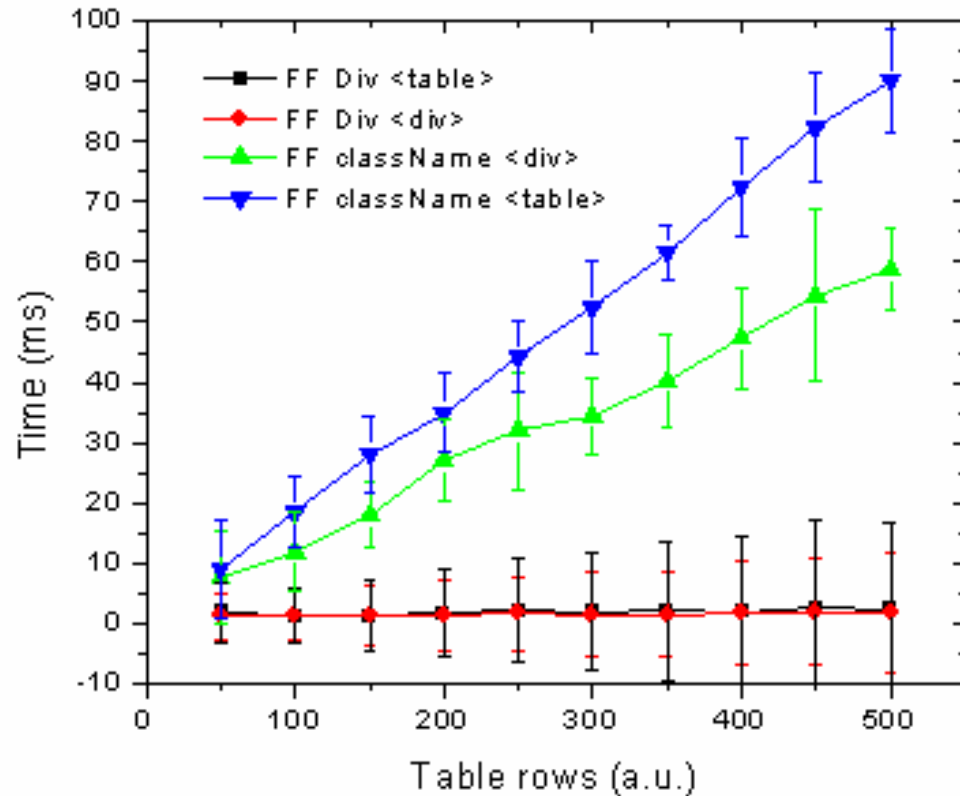
- Performance
- Usability
- Debugging
- Other Issues
- Patterns
- Building Applications

Performance - CSS

- More than one way to skin a cat

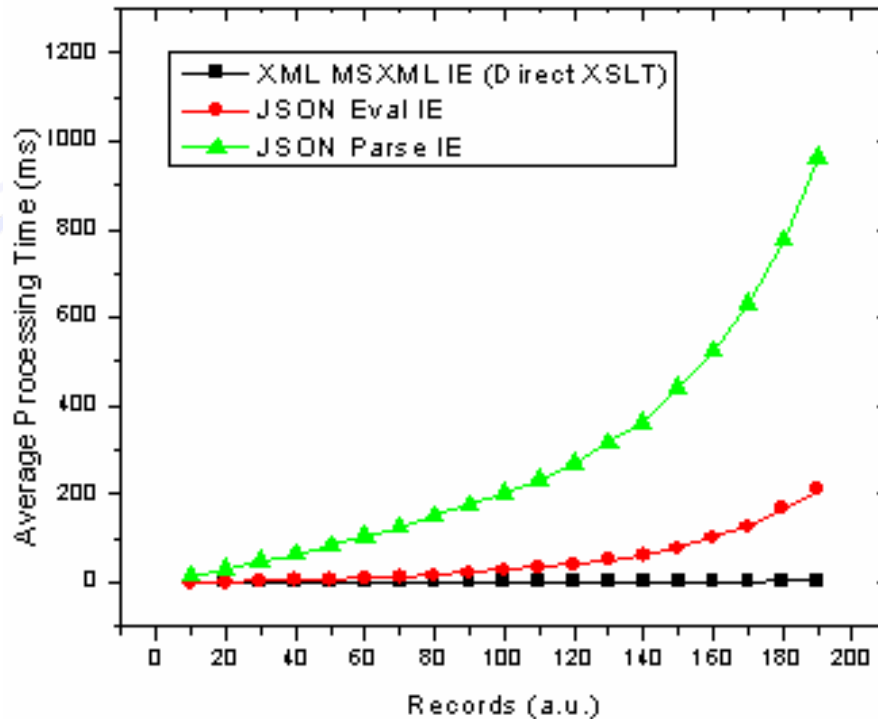
`<div class="red"></div>`

- Using a Div tag can be faster than className



<http://blogs.ebusiness-apps.com/dave>

Performance - Data



<http://blogs.ebusiness-apps.com/dave>

- Comparing JSON parsing using
 - JSON.js
 - eval(JsonString)
 - XML
- XML + XSLT is the fastest

Usability

- Graceful failure
- Accessibility
- Bookmarks
- Back button
- Changing page unexpectedly
- “Yellow fade”
- More by Alex Bosworth

<http://alexbosworth.backpackit.com/pub/67688>

Debugging

- Mozilla has Venkman
- Internet Explorer has Microsoft Script debugger
- Generally more art than science
- CSS ...

Other Issues

- Cross browser compatibility
 - Generally Firefox and Internet Explorer tops
- Learning curve
- IP control
- At the mercy of standards and browsers

Patterns

- Data
 - Caching (App server, Web server, Client)
 - Concurrency
 - Persistence (Flash SharedObject, UserData)
- XHR
 - Connection pooling
 - Throttling

<http://www.ajaxpatterns.org>

Building Applications

- Ways to build AJaX apps
 - Hand
 - Framework
 - User Interface Components
 - IDE (General Interface)

Frameworks

- AJAX.Net
- Backbase
- Bitkraft (.NET)
- Django
- **DOJO**
- **DWR** (Java)
- Microsoft Atlas
- **MochiKit**
- **Prototype**
- **Rico**
- Sajax
- Sarissa (XML/XSL)
- Script.aculo.us

User Interface Components

- Encapsulated functionality
 - eBusiness Applications

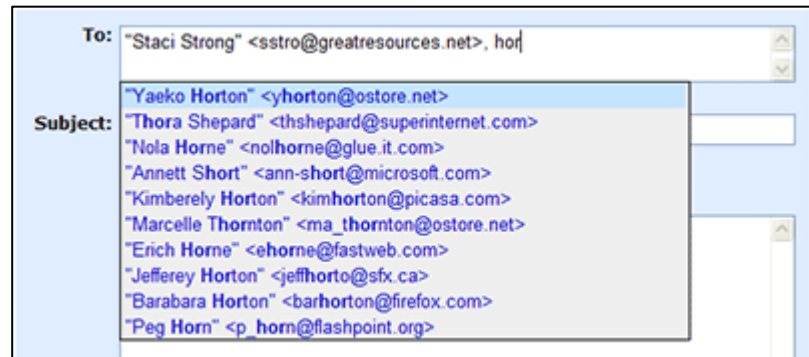
<http://www.ajaxinfo.com>

Product	Date	Unit Price	Quantity	Total	Remove
Microwave	Saturday, September 18 2004	149.00	2	298.00	
Can of Cola	Wednesday, September 22 2004	0.49	7	3.43	
Television	Sunday, October 17 2004	129.95	3	389.85	
Can of Cola	Friday, October 29 2004	0.49	4	1.96	
Nail	Wednesday, November 10 2004	0.03	7	0.21	

							Page
--	--	--	--	--	--	--	------

Henry		999.00	<input checked="" type="checkbox"/> charge	security more	testing	http://www.yahoo.com
Intra		5,299.22	<input type="checkbox"/> notcharge	security	bzxb	http://www.cnn.com
Intra		5,550.00	<input type="checkbox"/> notcharge	storage	testing	http://www.ebusiness-apps.com
Henry		8,080.00	<input checked="" type="checkbox"/> charge	security	testing	http://developer.ebusiness-apps.com
Henry		30.00	<input checked="" type="checkbox"/> charge	catering	testing	http://www.google.com
Aceme		500.00	<input type="checkbox"/> notcharge		testing	http://support.ebusiness-apps.com
Henry		600.00	<input type="checkbox"/> notcharge	security	testingdfdf	http://www.wcm.at
Henry		889.00	<input checked="" type="checkbox"/> charge	security	more	http://www.msn.com

							Page
--	--	--	--	--	--	--	------



To: "Staci Strong" <sstro@greatresources.net>, hor|

Subject: "Yaeko Horton" <yhorton@ostore.net>
"Thora Shepard" <thshepard@superinternet.com>
"Nola Horne" <nolhorne@glue.it.com>
"Annett Short" <ann-short@microsoft.com>
"Kimberely Horton" <kimhorton@picasa.com>
"Marcelle Thornton" <ma_thornton@ostore.net>
"Erich Horne" <ehorne@fastweb.com>
"Jefferey Horton" <jeffhorto@sfx.ca>
"Barabara Horton" <barhorton@firefox.com>
"Peg Horn" <p_horn@flashpoint.org>

Components - Example

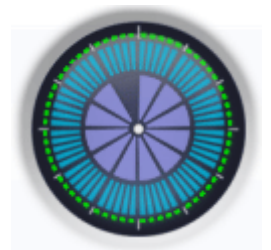
Product	Date	Unit Price	Quantity	Total	Remove
Microwave	Saturday, September 18 2004	149.00	2	298.00	<input type="checkbox"/>
Can of Cola	Wednesday, September 22 2004	0.49	7	3.43	<input type="checkbox"/>
Television	Sunday, October 17 2004	129.95	3	389.85	<input type="checkbox"/>
Can of Cola	Friday, October 29 2004	0.49	4	1.96	<input type="checkbox"/>
Nail	Wednesday, November 10 2004	0.03	7	0.21	<input type="checkbox"/>

```

<eba:gridlist allowInsert="Y" getHandler="getsales.asp" saveHandler="savesales.asp" rowhighlight="Y" PageSize="10">
  <eba:columnDefinition type="CHECKBOX" label=" " xdatafld="DummyField" values="1: ,0: " initial="0" />
  <eba:ColumnDefinition type="IMAGE" label=" " xdatafld="NewSale" initial="images/addboxsmall.gif" />
  <eba:ColumnDefinition type="DATE" label="Date" xdatafld="TT" mask="mmmm dd yyyy" celldisabled="Y" />
  <eba:ColumnDefinition type="LOOKUP" label="Product" getHandler="pl.asp" onvalidate="SelectProduct()" />
  <eba:ColumnDefinition type="NUMBER" label="Quantity" xdatafld="Quantity" onvalidate="CalcTotal()" />
  <eba:ColumnDefinition type="NUMBER" label="Price" xdatafld="Price" mask="$#,##0.00" onvalidate="CalcTotal()" />
  <eba:ColumnDefinition type="NUMBER" label="Total" xdatafld="Total" mask="$#,##0.00" celldisabled="Y" />
  <eba:ColumnDefinition type="TEXT" label="Card" xdatafld="CardType" celldisabled="Y" initial="Visa" />
  <eba:ColumnDefinition type="TEXT" label="Name" xdatafld="CardName" celldisabled="Y" />
  <eba:ColumnDefinition type="TEXT" label="Number" xdatafld="CardNumber" celldisabled="Y" />
  <eba:ColumnDefinition type="TEXT" label="Expiry" xdatafld="ExpiryDate" celldisabled="Y" />
</eba:gridlist>

```

- Traditional Web Applications
- AJaX Defined
- Benefits of AJaX
- Technologies
- AJaX Problems
- ***The Future of the Rich Web***



The Future of AJaX

- Moving forward with the AJaX “technique”
- Usability
- Desktop on the Web / “WebOS”
- We will see more integration with
 - Flash
 - Scaling Vector Graphics (SVG)
 - XForms
 - XHTML 2 / HTML 5

The Far Future











- Declarative (XML) based programming is the hot ticket ...
 - XML User-Interface Language (XUL)
 - Extensible Application Markup Language (XAML)
 - Macromedia Flex

The AJaX Challenge

- Moving past the hype
- Making cool apps that are actually beneficial to the user!

eBusiness Applications

- Give me your business card or email me for a free license!

Client	Image	Quantity	Charge	Service	Memo	Inet
Herry		30.00	<input checked="" type="checkbox"/> charge	catering	testing	http://www.google.com
Aceme		500.00	<input type="checkbox"/> notcharge		testing	http://support.ebusiness-apps.com
Herry		600.00	<input type="checkbox"/> notcharge	security	testingdfdf	http://www.wcm.at
Herry		889.00	<input checked="" type="checkbox"/> charge	security	more	http://www.msn.com
Herry		999.00	<input checked="" type="checkbox"/> charge	security more	testing	http://www.yahoo.com
Intra		5,299.22	<input type="checkbox"/> notcharge	security	bxibb	http://www.cnn.com
Intra		5,550.00	<input type="checkbox"/> notcharge	storage	testing	http://www.ebusiness-apps.com
Herry		8,080.00	<input checked="" type="checkbox"/> charge	security	testing	http://developer.ebusiness-apps.com
Herry		30.00	<input checked="" type="checkbox"/> charge	catering	testing	http://www.google.com
Aceme		500.00	<input type="checkbox"/> notcharge		testing	http://support.ebusiness-apps.com

Product	Date	Unit Price	Quantity	Total	Remove
Microwave	Saturday, September 18 2004	149.00	2	298.00	<input checked="" type="checkbox"/>
Can of Cola	Wednesday, September 22 2004	0.49	7	3.43	<input checked="" type="checkbox"/>
Television	Sunday, October 17 2004	129.95	3	389.85	<input checked="" type="checkbox"/>
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To: "Staci Strong" <sstro@greatresources.net>, hor|

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"Annett Short" <ann-short@microsoft.com>
"Kimberely Horton" <kimhorton@picasa.com>
"Marcelle Thornton" <ma_thornton@ostore.net>
"Erich Horne" <ehorne@fastweb.com>
"Jefferey Horton" <jeffhorto@sfx.ca>
"Barabara Horton" <barhorton@firefox.com>
"Peg Horn" <p_horn@flashpoint.org>

Thank You

Contact

Dave Johnson

eBusiness Applications

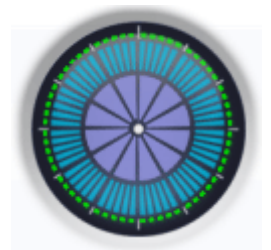
<http://www.ebusiness-apps.com>

<http://blogs.ebusiness-apps.com/dave>

djohnson@ebusiness-apps.com

604 985-9287

- Presentation
 - <http://blogs.ebusiness-apps.com/dave/>
- Links
 - <http://developer.ebusiness-apps.com>
 - <http://www.ajaxinfo.com>
 - <http://www.ajaxian.com>
 - <http://www.ajaxpatterns.org>
 - <http://www.ajaxmatters.com>



Questions