Implementing AJAX with Java

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Housekeeping

- **Submitting questions to speaker**
  - Submit question at any time by using “Ask a question” section located on lower left-hand side of your console.
  - Questions about presentation content will be answered during 10 minute Q&A session at end of webcast.
- **Technical difficulties?**
  - Click on “Help” link
  - Use “Ask a question” interface

Main Presentation

What is AJAX?

- **Asynchronous JavaScript + XML**
  - Google *
  - Flickr
  - Outlook Web Access
- **Common uses**
  - Data validation
  - Real-time querying
  - Saving data “behind the scenes”

Grokking AJAX

- **JavaScript**
  "One script to rule them all"
- **Document Object Model (DOM)**
  document.getElementById('myDomNode');
- **Events**
  domElement.onclick = myHandler;
- **Cascading StyleSheets (CSS)**
  .highlightClass {background-color:yellow;}

AJAX in a Nutshell

```
this.httpObj.open("POST", this.url, this.async, "", "");
if (this.async)
{
  var _this = this;
  this.httpObj.onreadystatechange = function() {
    if(_this.httpObj.readyState==4)
      _this.ready.call(_this.context, _this.handle());
    };
}
this.httpObj.setRequestHeader("Content-Type","text/xml");
this.httpObj.send(xmlData);
```

Java and JavaScript Quick Comparison

Language	Java	JavaScript
Compilation	*Compiled*	*???*
Typing	*Strongly-typed*	*Dynamically-typed*
Classes	*Class*	*Function*
Inheritance	*Classical*	*Prototypal*

Simple OO JavaScript

- JavaScript's more afraid of you than you are of it!

```
var eba = {};

eba.customer = function()
{
}
```


Simple OO JavaScript

- JavaScript's more afraid of you than you are of it!

```
var eba = {};

eba.customer = function()
{
    this.firstName = "John";
    this.lastName = "Doe";
}
```

Simple OO JavaScript

- JavaScript's more afraid of you than you are of it!

```
var eba = {};

eba.customer = function()
{
    this.firstName = "John";
    this.lastName = "Doe";
    this.getName = function()
    {
        return this.firstName + ' ' + this.lastName;
    }
}
```

Simple OO JavaScript

- JavaScript's more afraid of you than you are of it!

```
var eba = {};

eba.customer = function(fName, lName)
{
    var firstName = fName;
    var lastName = lName;
    this.getName = function()
    {
        return firstName + ' ' + lastName;
    }
}
```

Simple OO JavaScript

- JavaScript's more afraid of you than you are of it!

```
var myCustomer = new eba.customer("John", "Doe");

alert(myCustomer.getName());
```

What About AOP?

- There is no spoon!

```
eba.customer.prototype.myOwnMethod = function()
{
        alert("this is my customer method!");
}

var myCustomer = new eba.customer("John", "Doe");

alert(myCustomer.getName());

myCustomer.randomProperty = "no one knows about this";
```

AJAX + Java

AJAX + Java Landscape

AJAX + Java Landscape

AJAX + Java Landscape

AJAX + Java Landscape

Direct Web Remoting (DWR) Demo

JavaServer Faces (JSF)

- **Component based development has too many advantages to count! But let's try …**
  - Incremental benefit
  - Cross-browser (ack!) out of the box
  - Tested
    - Performance
    - Usability
  - No (or little) JavaScript development!

Model-View-Controller (MVC) Frameworks

- **You can "componentize" your AJAX *and* use it with your MVC framework**
- **JSF works with MVC**
  - Spring
  - Struts

"Creating them [AJAX components] is extremely hard."

James Gosling, Father of Java

JSF Demo

Architecture

Don't Forget What you Know!

- Now architecture is even more important
- No more course grained requests
- Scaling
- Caching (client + server)
- Data serialization

Scaling

- **Client server request profile may change**
- **Requests may be**
  - more frequent
  - more fine grained
  - less stateful
- **Be smart about AJAX, use all the tools you have**
  - Use HTTP GET requests to take advantage of caching
  - Use server side tools like Hibernate (or EJB 3!?)
- **Do *as much as you can* on the client - sorting, filtering, joining etc**

Data Transfer

- **REST is focused on resources**
  - Can be good for scalability due to efficient caching and statelessness
  - Remember, AJAX can create ***lots*** of requests
- **SOAP (or XML RPC) is about verbs**
  - Generally fits better with your server Model
- **Don't get caught up in the politics –** *pick what works*

Data Transfer Format / Encoding

- **JavaScript Object Notation (JSON)**
  - Can be fast in Firefox
  - Changing the format of JSON is a pain
- **XML (you know the one)**
  - Nice in a distributed environment and when working with off the shelf components
  - Java has good support for XML and (de)serialization
  - XSLT can be leveraged in IE + Firefox or on the server to transform data formats
  - XSLT on the client has added scalability benefit
  - Also nice for internationalization

Patterns

- **MVC – Model can update Views!**
- **Breaking patterns**
  - Many traditional “design patterns” can be broken or made easier with dynamic languages like JavaScript
  - Run-time class extension?
  - Run-time object augmentation?
  - Aspect oriented design?

Quality Assurance

“There's no ability to do cross-platform QA; you've just got to do them one by one.”

James Gosling, again.

Development Tools

- **IDE**
  - IntelliJIDEA
  - JSEclipse
  - TibcoGI
  - Eclipse/NetBeans/etc
- **Frameworks**
  - Dojo
  - Prototype
  - DWR

Testing

- **JSUnit**
  - Unit testing for JavaScript
- **Selenium**
  - Web user interface testing
- **Browser cam**
  - Let someone else do the work!
- **Rhino**

Debugging

- **Relatively mature tools actually available**
- **Mozilla**
  - Venkman
  - Firebug
- **Internet Explorer**
  - Microsoft Script Debugger

- **CSS + DOCTYPE = ☹**

Firebug Demo

Deployment

- Make your users happy – JSDoc

```
/**
 *@class
 * Class description
 * @param {string} paramName The parameter name
 * @param {Element} el Some DOM node
 * @param {object} jsObj SomeJavaScript object
 * @constructor
 * @returns {array}
*/
```

“Using JSF you can build JSF components that download AJAX on the client.”

James Gosling, in case you were not sure.

About Dave

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AJAX Information

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Questions?

Thank you for attending

If you have any further questions, e-mail webcasts@jupitermedia.com