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INTERFACE21

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Ajax, DWR and Spring

Bram Smeets
Interface21

Spring

Topics

- What is Ajax?
- The DWR approach to Ajax
- Advanced DWR
- Using Spring & DWR
- DWR roadmap
- Conclusion

Ajax

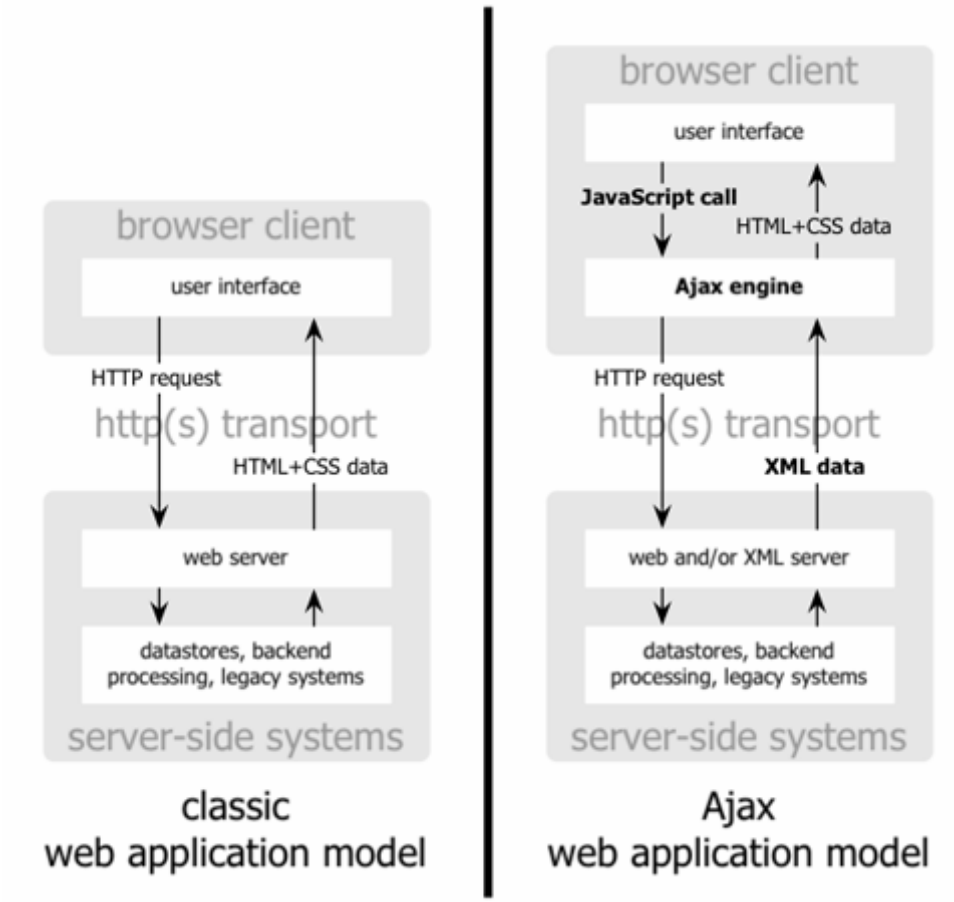
- Not one technology, several technologies
  - XHTML and CSS
  - Document Object Model (DOM)
  - XML (and XSLT)
  - XMLHttpRequest (XHR)
  - JavaScript

Asynchronous JavaScript And Xml

Jesse James Garrett, 2005

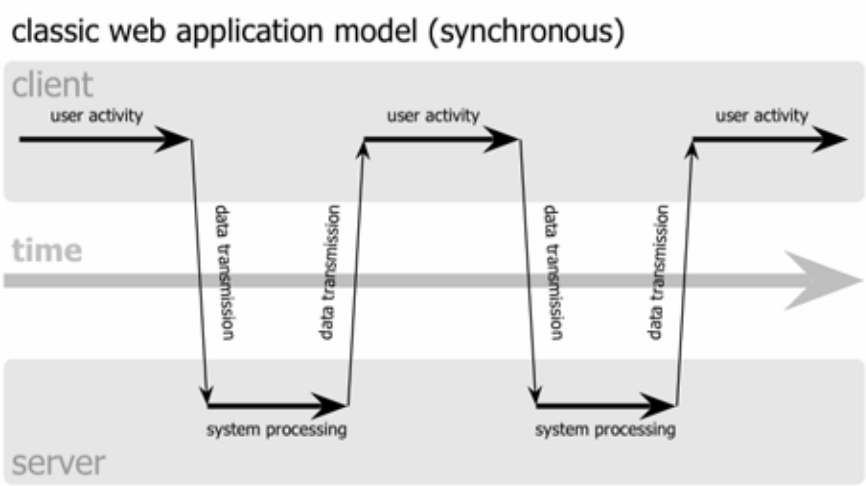
Ajax = DHTML + XHR

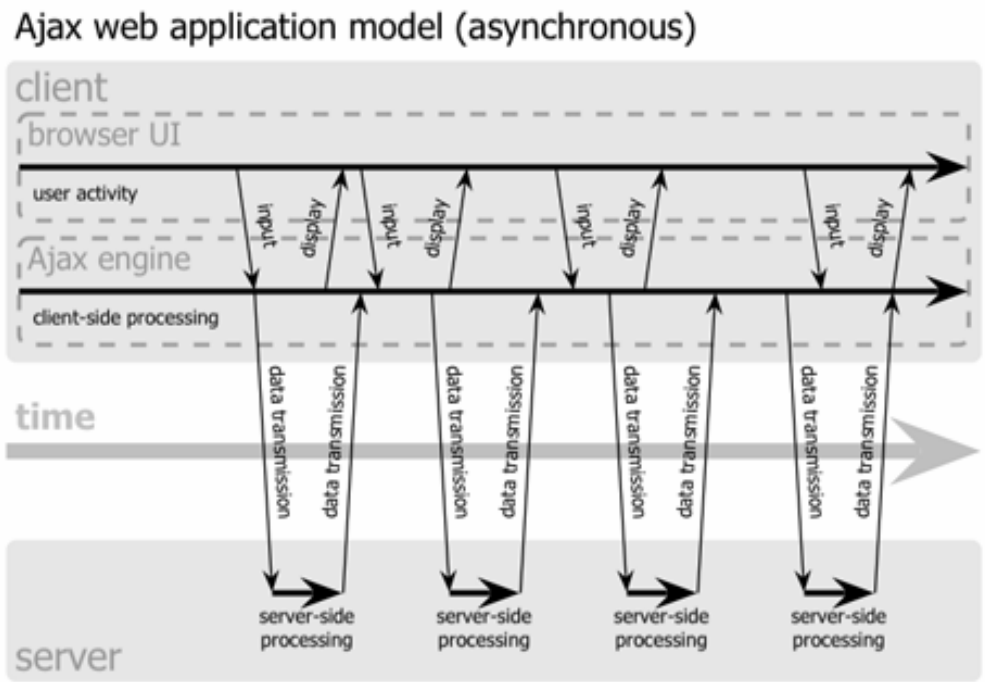
Ajax – Architecture (1)



Jesse James Garrett, 2005

Ajax – Architecture (2)





Jesse James Garrett, 2005

Ajax - Issues

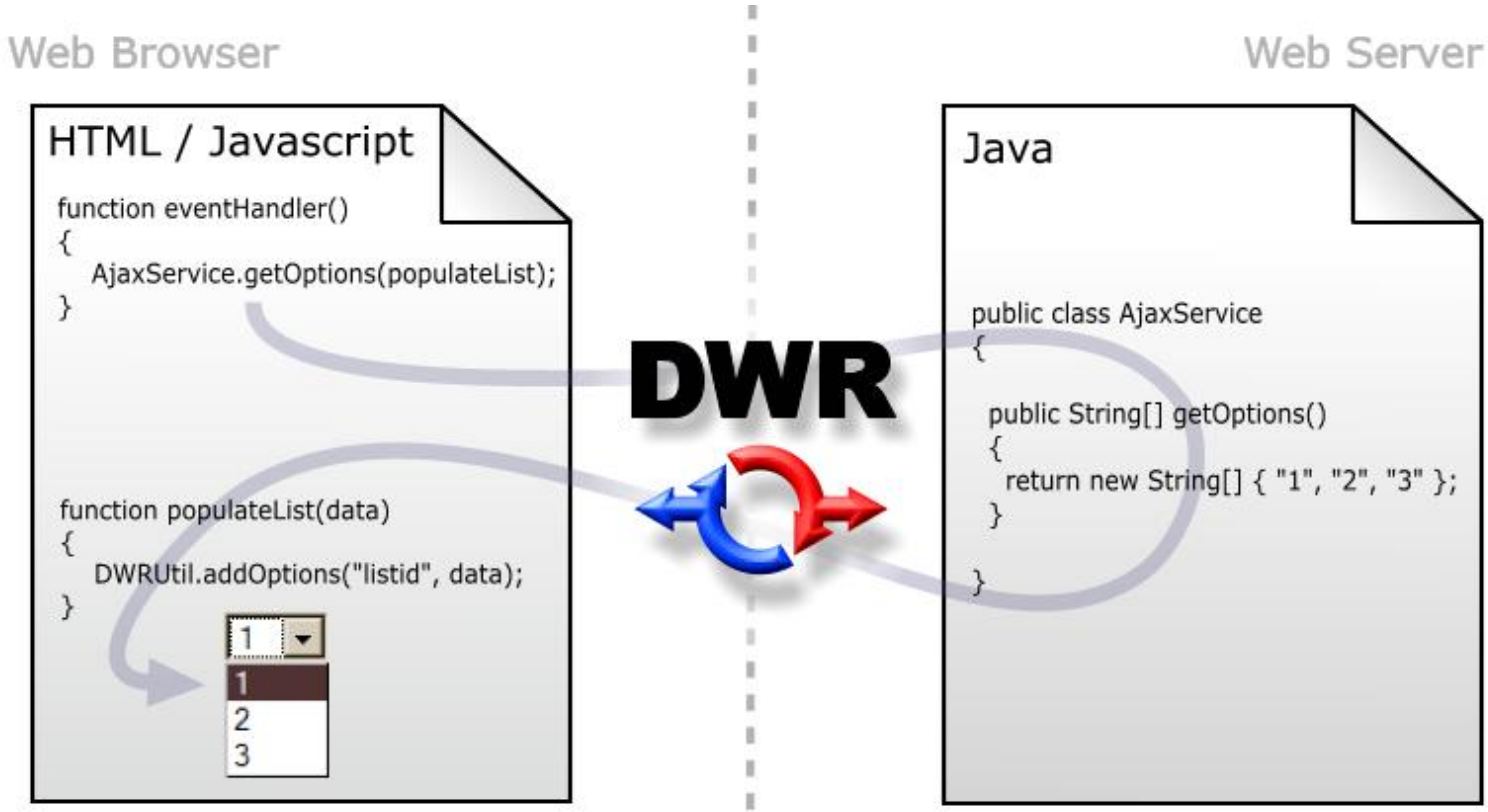
- Browser incompatibilities
  - ActiveX in IE
  - Native in Mozilla/Firefox
- Back button and browser history
- Working with XML in JavaScript

Ajax – Framework overview

- JSON-RPC
- GWT
- DWR
- Many more…

- Why DWR?
  - Mostly used framework (according to Google and Burton Group)
  - Integrates best with Spring!

DWR – Overview



DWR – Features (1)

- RPC-style Ajax
- Java to JavaScript marshalling (and vice versa)
  - Uses JavaScript objects
- Facilitate browser incompatibilities
  - Supports most browsers
  - Even allows fallback to iframes
  - Allows for cross-side scripting

DWR – Features (2)

- Provides integration with most common Java frameworks
  - Struts, Webwork, JSF, Hibernate, Rife, Spring, and etcetera…
- Provides good security mechanism
- Comes with handy utility methods
- Reverse Ajax

DWR – Configuration (1)

- Declare `DwrServlet` in `web.xml`

```
<servlet>
    <servlet-name>dwr</servlet-name>
    <servlet-class>org.directwebremoting.servlet.DwrServlet</servlet-class>
    <init-param>
        <param-name>debug</param-name>
        <param-value>true</param-value>
    </init-param>
</servlet>

<servlet-mapping>
    <servlet-name>dwr</servlet-name>
    <url-pattern>/dwr/*</url-pattern>
</servlet-mapping>
```

DWR – Configuration (2)

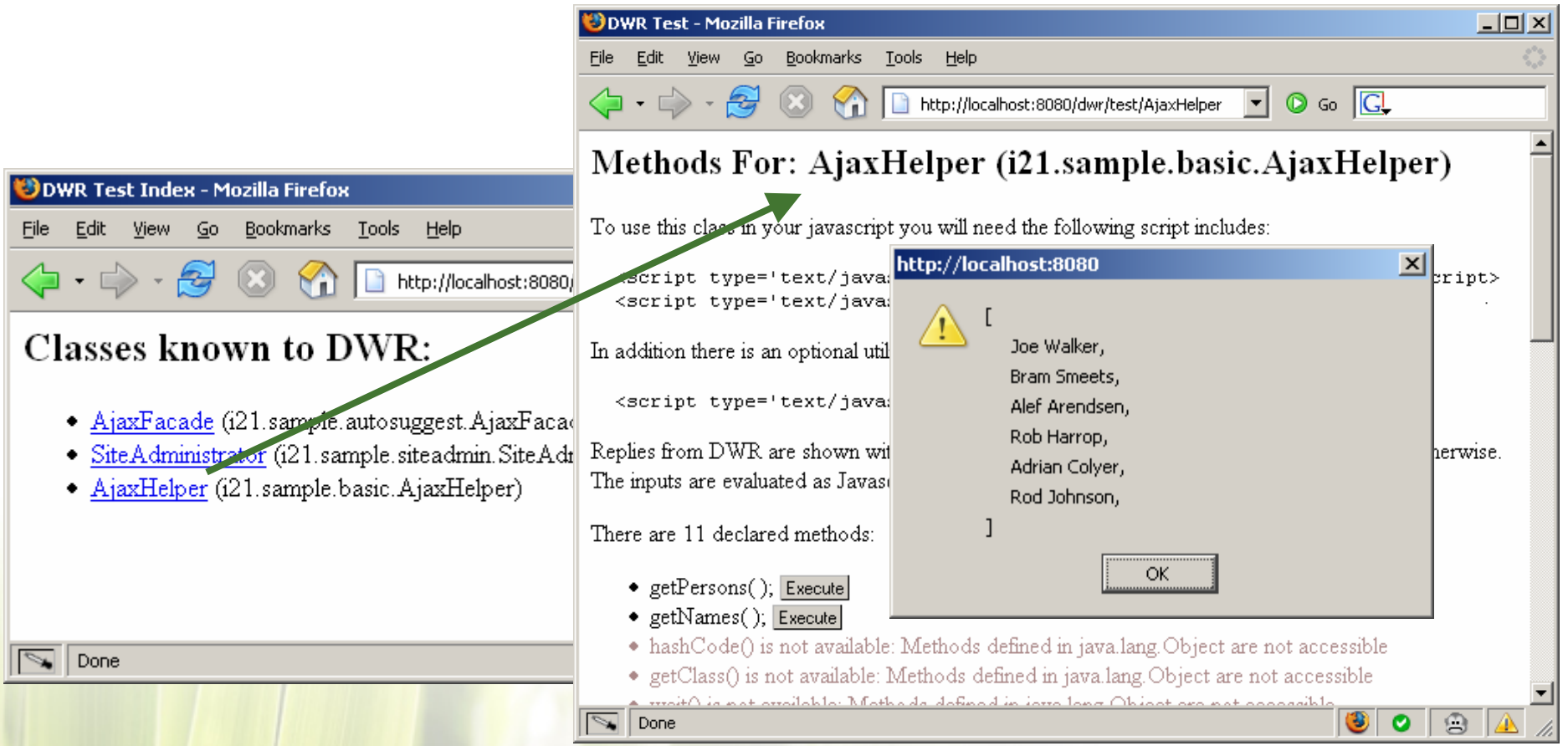
- Add `dwr.xml` in `/WEB-INF`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE dwr PUBLIC
        "-//GetAhead Limited//DTD Direct Web Remoting 2.0//EN"
        "http://www.getahead.ltd.uk/dwr/dwr20.dtd">

<dwr>
    <allow>
        <create creator="new" javascript="AjaxFacade">
            <param name="class" value="i21.sample.basic.AjaxFacade"/>
        </create>
    </allow>
</dwr>
```

DWR – Debug pages

- Set the `init-param` of the `DWRServlet` to `true`



DWR – A sample web page

- In your web page add:

```
<script type="text/javascript" src="/dwr/interface/AjaxHelper.js"></script>
<script type="text/javascript" src="/dwr/engine.js"></script>
```

- Call methods on the exposed object

```
<script type="text/javascript">
    function getData() {
        AjaxHelper.getData(handleData);
    }

    function handleData(data) {
        alert('data: ' + data);
    }
</script>
```

Demo

DWR

DWR – Security

- No objects/classes are exposed without explicitly configuring it!
- All methods on exposed objects are exposed by default
  - Use include/exclude rules per method
- Only objects are marshaled for which a converter is registered
- Role restrictions
  - Use security constraints on DWR paths
  - Specify an auth constraint per creator (JAAS)
  - Use Acegi interceptors
- Disable debug mode in live environment!!

DWR – Utility functions

- Include the utility script

```
<script type="text/javascript" src="/dwr/util.js"></script>
```

- Among others, it offers:
  - $('id')
    - Works on most browsers
  - DWRUtil.toDescriptiveString(value)
    - Generic toString() method
  - DWRUtil.cloneNode("template")
  - DWRUtil.setValue(element, val)
  - DWRUtil.getValue(element)
  - DWRUtil.addOptions(list)
  - DWRUtil.removeAllOptions(element)
  - DWRUtil.addRows(element, data, …)
  - DWRUtil.removeAllRows(element)

DWR – Advanced features (1)

- Signatures
  - Explicitly specify method signatures

```
<signatures>
    <![CDATA[
        import java.util.List;
        import i21.sample.basic.Person;
        PersonManager.batchUpdate(List<Person> list);
    ]]>
</signatures>
```

DWR – Advanced features (2)

- Accessing servlet parameters
  - Use `WebContext`

```
WebContext ctx = WebContextFactory.get();
ctx.getHttpServletRequest();
ctx.getHttpServletResponse();
ctx.getServletContext();
...
```

  - Or add them to the method signature on your exposed beans
    - Auto filled in by DWR

```
Person getPerson(HttpServletRequest request, long id);
```

DWR – Advanced features (3)

- Ajax filters
  - Extra latency filter
- GMail style loading messages
  - DWRUtil.useLoadingMessage();
  - DWRUtil.useLoadingMessage('Waiting…');
  - Customize even further:
    - `$('disabledZone').style.color = white;`

DWR – Advanced features (4)

- Other options
  - Globally: DWREngine.setX()
  - Per call: { timeout: 500, callback: myCallback }

  - timeout
  - errorHandler/warningHandler
  - preHook/postHook
  - method (DWREngine.XMLHttpRequest, DWREngine.IFrame or DWREngine.ScriptTag)
  - verb (GET or POST)

DWR – Advanced features (5)

- Batching
  - `beginBatch();`
  - Make some DWR requests
  - `endBatch();`
- Annotation support
  - @Create
  - @Convert
  - @RemoteMethod
  - @RemoteProperty

Reverse Ajax (1)

- Call Javascript from Java code
- Many use cases
  - Chat application
  - Email application
  - Progress bar
- Work in progress!

Reverse Ajax (2)

- DWR provides the means to proactively send Javascript to the browser
  - JavaScript: Turn Reverse Ajax on

```
DWREngine.setReverseAjax(true);
```

  - Java: Send scripts to the browser

```
scriptSession.addScript("alert('Hi')");
```

Reverse Ajax (3)

- Use server-side API to call JavaScript functions
  - DWRUtil library

```
import org.directwebremoting.proxy.dwrutil.DwrUtil;
DwrUtilutil= new DwrUtil(...);
util.addOptions("selectId", array);
```

  - Script.aculo.us Effects library

```
import org.directwebremoting.proxy.scriptaculous.Effect;
Effect effect= new Effect(...);
effect.fade("selectId");
```

DWR & Spring

- DWR = AJAX with Spring made easy!
- Expose Spring-managed beans by means of JavaScript

DWR & Spring - Configuration (1)

- Option 1
  - Define a `ContextLoaderListener` in `web.xml` to load the beans to expose
  - Add a create statement to `dwr.xml`

```
<create creator="spring" javascript="AjaxFacade">
    <param name="beanName" value="ajaxFacade"/>
</create>
```

- Option 2
  - Use the `ServletWrappingController` to wrap the `DWRServlet`
- Option 3
  - Have DWR load the application context(s)

```
<create creator="spring" javascript="AjaxFacade">
    <param name="beanName" value="ajaxFacade"/>
    <param name="location-1" value="data-layer.xml"/>
    <param name="location-2" value="service-layer.xml"/>
</create>
```

DWR & Spring - Configuration (2)

- Use new DWR namespace

```
<bean id="ajaxFacade" class="i21.sample.autosuggest.AjaxFacade">
   <dwr:remote javascript="AjaxFacade" />
   <property name="autoSuggestService" ref="autoSuggestService" />
</bean>

<dwr:configuration>
   <dwr:create type="new" javascript="AjaxHelper"
                  class="i21.sample.basic.AjaxHelper" />

   <dwr:convert class="i21.sample.basic.Person" type="bean" />
</dwr:configuration>

<dwr:controller id="dwrController" debug="true" />
```

Demo

Spring & DWR

DWR Roadmap

- Back button support
- Tighter integration with Spring
  - Extra form controllers e.g. for validation
  - Use Spring scoping
  - Enhancement of the Spring namespace support
- What feature(s) would you like?

Conclusion

- Ajax enables to build better web applications
- DWR provides easy Ajax
- DWR integrates nicely with Spring
- Still more to come…

Questions?

www.directwebremoting.org
bram.smeets@interface21.com

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