Exploring HTML5 With JavaServer Faces 2.0

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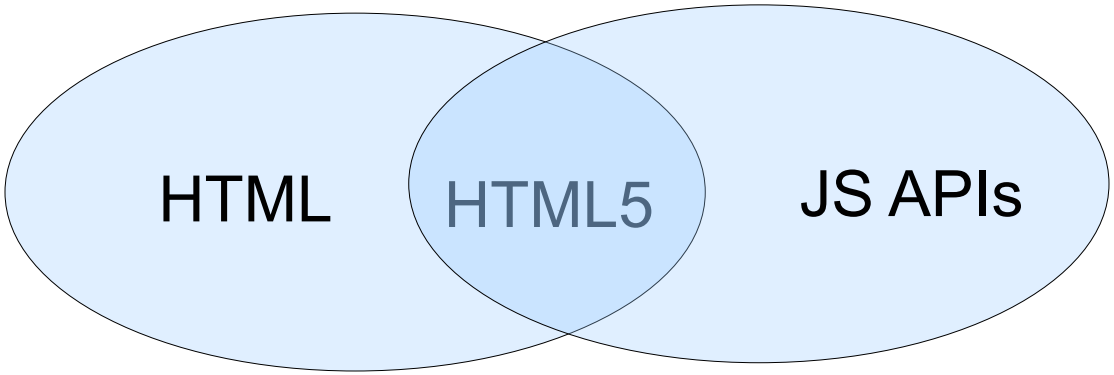
AGENDA

- HTML 5 Overview
  - What is HTML 5?
  - HTML 5 Features
- JSF 2.0 Component Model And HTML 5
  - Component Model Overview
  - Enhancing Components With HTML 5
- Demos

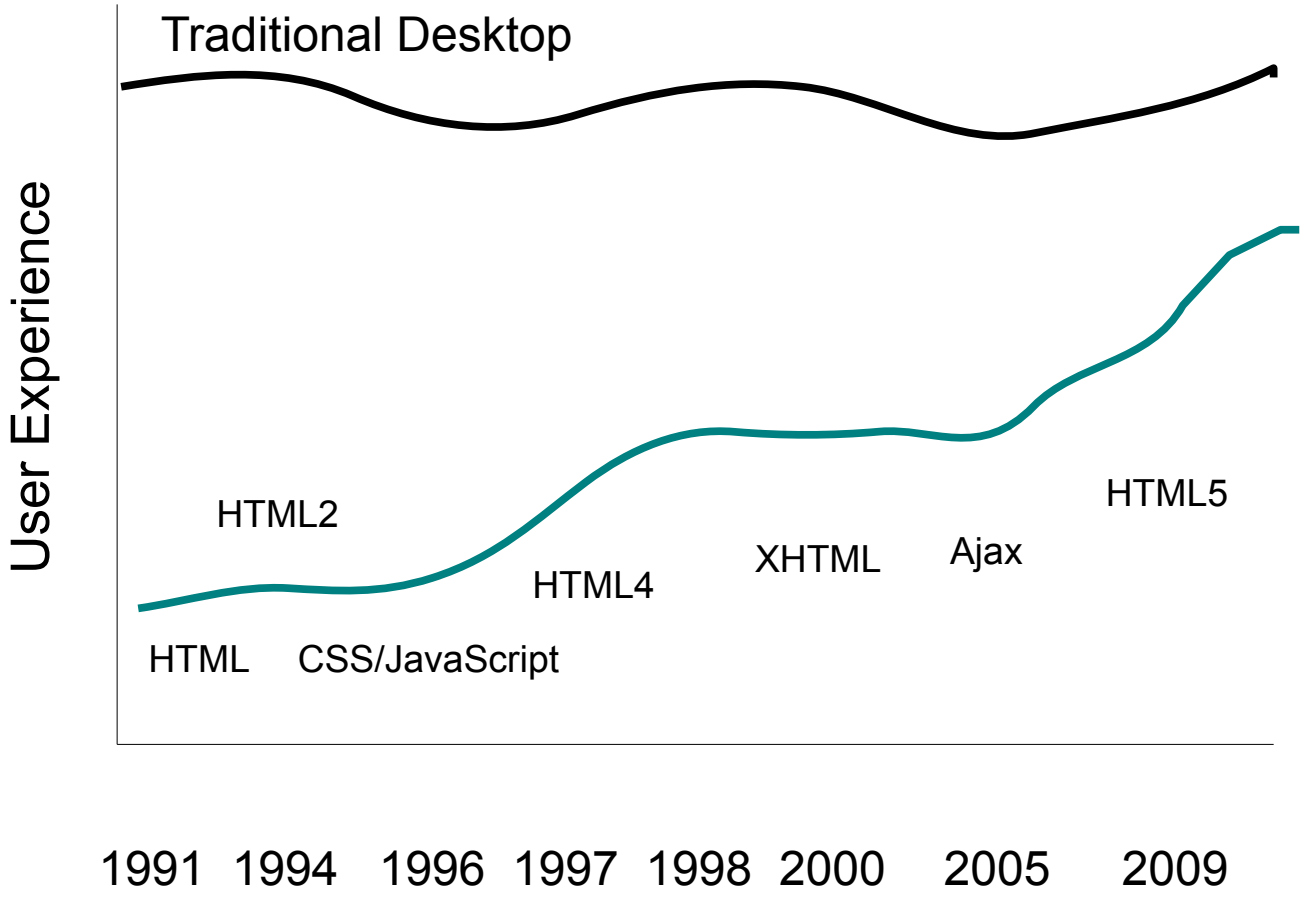
What Is HTML 5?

- Proposed next standard for HTML 4.0.1, XHTML 1.0 and DOM Level 2 HTML
- Features promote RIA



- Pioneered in 2004; First working spec draft: 2008
- CSS 3 : Working Draft – April 2010

What Is HTML 5?



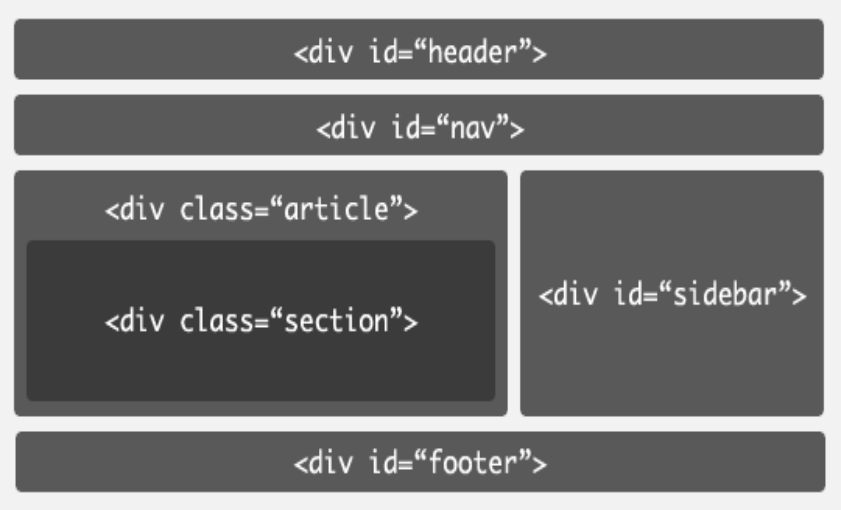
What is HTML 5? When Will Specification Go Final?

At least that's the rumor.....
Hopefully it will happen before this...

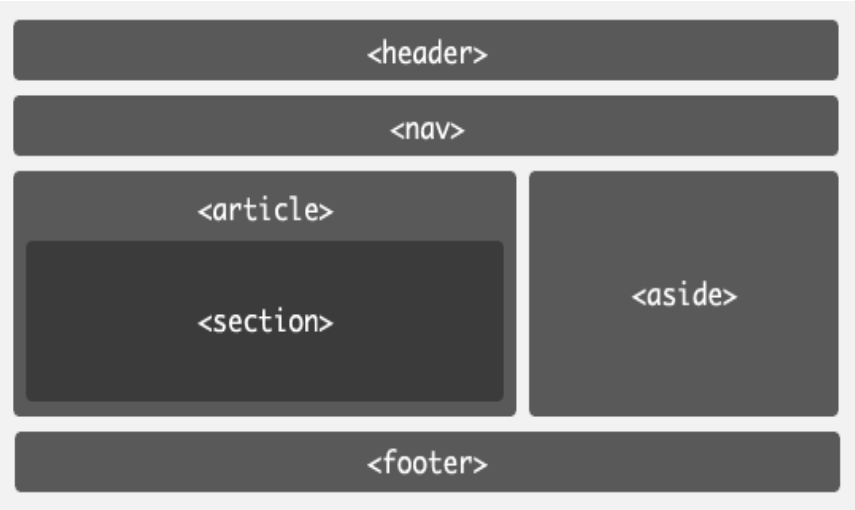
HTML 5 Features: HTML Elements

- Semantic elements for structure:
  - <header>, <nav>, <article>, <section>, <aside>, <footer>

HTML4



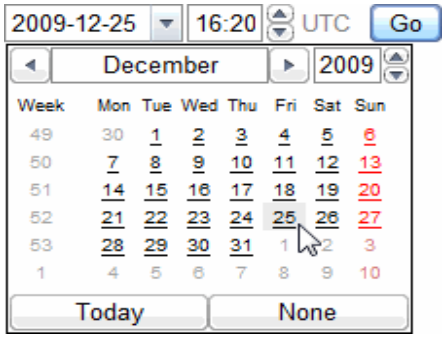
HTML5



- Some advantages:
  - Nested sections with header levels beyond 6 levels in HTML 4
  - Cleaner source; easier to author (don't need to go “div crazy”)

HTML 5 Features : Html Elements/Attributes

- Other semantic elements:
  - <figure>, <dialog>, <meter>, <progress>...
  - <progress> can be used with JavaScript to generate “real-time” progress bar
- Form elements / attributes:
  - <input name=”q” placeholder=”Search Here”>
  - <input name=”q” autofocus>
  - Attribute values for <input type=
    - email (Great for mobile devices – iphone!). number, range, date, datetime, month, week, time, search, color
  - For date / time Opera would render:



HTML 5 Features : Media Elements

- Audio
  - Most audio played through flash plugin
  - Not all browsers have same plugins
- <audio> element:
  - Standard way to include audio: sound files or audio stream
  - 3 supported formats: Ogg Vorbis, MP3, Wav (browsers may support subset)
- Usage example:

```
<audio controls="controls">
      <source src="song.ogg" type="audio/ogg">
      <source src="song.mp3" type="audio/mpeg">
       Your browser does not support the audio element.
 </audio>
```

- Specify multiple audio file formats: browser will use first recognized format
- “controls” attribute: adds “play”, “pause”, and “volume” controls

HTML 5 Features : Media Elements

- Video
  - Most video played through flash plugin
  - Not all browsers have same plugins
- <video> element:
  - Standard way to include video
  - 2 supported formats: Ogg Vorbis, MPEG4 (browsers may support subset)
- Usage example:

```
<video width=”320” height=”240”  controls="controls">
    <source src="movie.ogg" type="video/ogg">
    <source src="movie.mp4" type="video/mpeg">
     Your browser does not support the video element.
</video>
```

- Specify multiple video file formats: browser will use first recognized format
- “controls” attribute: adds “play”, “pause”, and “volume” controls

HTML 5 Features : Graphic Elements

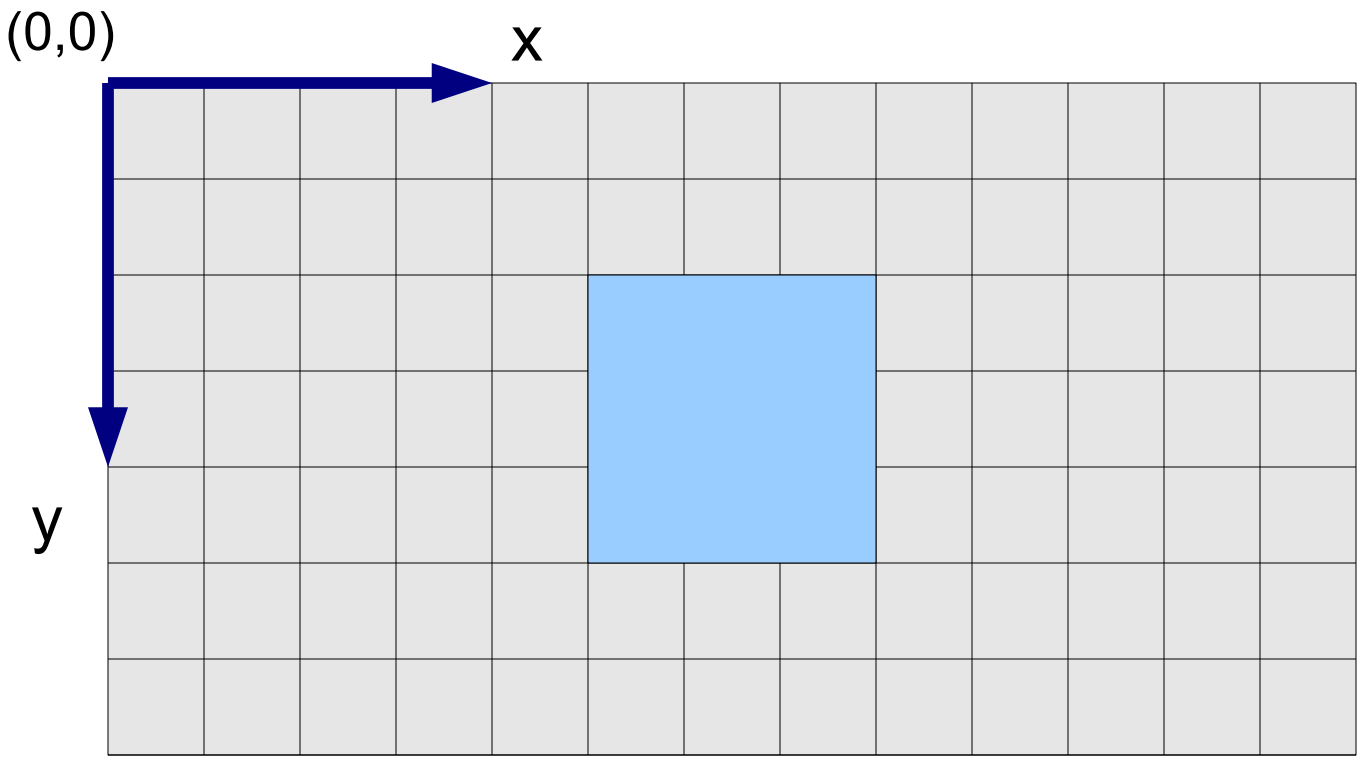
- Canvas
  - A container for graphics – use JavaScript to paint the graphics
  - Use *height* and *width* attributes (pixels) for canvas dimensions
  - Example:

```
<canvas id=”aCanvas” height=”80” width=”100”> </canvas>

<script type="text/javascript">
    var canvas=document.getElementById('aCanvas');
    var context=canvas.getContext('2d');
    context.fillStyle='#FF0000';
    context.fillRect(0,0,80,100);
</script>
```

HTML 5 Features : Graphic Elements: Canvas

- Standard graphics coordinate system

ctx.fillRect(5,2,3,3);



HTML 5 Features : Event Attributes

- Attach JavaScript to new event types:
  - Mouse events:
    - ondrag, ondragend, ondragenter, ondragleave, ondragover, ondragstart, ondrop, onmousewheel, onscroll
  - Window events:
    - onafterprint, onbeforeprint, onbeforeonload, onerror, onhaschanged, onmessage, onoffline, ononline, ...
  - Form events:
    - onformhange, onforminput, oninput, oninvalid, …
  - Media events:
    - Apply to media elements such as <audio>, <video>

HTML 5 Features : JavaScript API

- Web Workers:
  - Separate JS processes running in separate threads
  - Execute concurrently; don't block UI
  - Message passing for coordination
  - High start-up performance cost; high memory cost

```
var worker = new Worker('worker.js');
worker.onmessage = function(event) {alert(event.data);};

worker.js:
   postMessage(data);
```

  - Delegation:
    - ➔ Split expensive tasks among multiple workers

HTML 5 Features : JavaScript API

- GeoLocation
  - JavaScript access to the browser's location
  - New property on global *navigator* object:: navigator.geolocation

```
function get_location() {
  If (Modernizr.geolocation) {
     navigator.geolocation.getCurrentPosition(show_map);
  } else  // no support...
..
}

function show_map(position) {
  var latitude = position.coords.latitude;
  var longitude = position.coords.longitude;
// do something interesting – show map for example
}
```

HTML 5 Features : JavaScript API

- Audio/Video manipulation:
  - Dynamically create <audio>, <video>
  - Add custom controls to <audio>, <video>
  - Control <audio>, <video> attributes

```
var video = document.createElement('video');
video.src  = 'video.ogv';
video.controls = true;
document.body.appendChild(video);
```

HTML 5 Features : JavaScript API

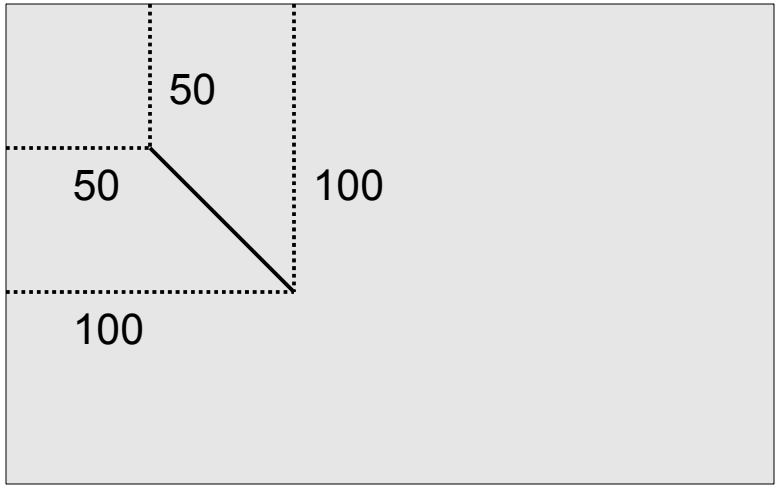
- Canvas:
  - JavaScript to enable drawing/animation in the browser

```
<canvas id="example" width="200" height="200">
        ...
</canvas>
        ...
var example = document.getElementById('example');
var context = example.getContext('2d');
context.fillStyle = "rgb(255,0,0)";
context.fillRect(30, 30, 50, 50);
```

HTML 5 Features : JavaScript API

- Canvas:
  - Functions for simple shapes:
    - fillRect(x,y,w,h) Draws rectangle
    - strokeRect(x,y,w,h) Draws outline of rectangle
    - clearRect(x,y,w,h) Clears pixels within given rectangle
  - Functions for complex shapes, paths

```
ctx.strokeStyle = "rgb(65, 60,
50)";
ctx.beginPath();
ctx.moveTo(50, 50);
ctx.lineTo(100,100);
ctx.stroke();
```



HTML 5 Features : JavaScript API

- Web Sockets:
  - Provide bi-directional communication channel in the browser
  - send() : Send data from browser to server
  - onmessage event handler: process data from server
  - Separate specification (from HTML 5)
  - Many server implementations: Grizzly, GlassFish 3.1, jWebsocket,Kaazing,...

```
var ws = new WebSocket("ws://www.websocket.org");
 ws.onopen = function(evt) { alert("Connection open ..."); };
 ws.send(data);
 ws.onmessage = function(evt) { alert( "Msg:  "  +  evt.data); };
 ws.onclose = function(evt) { alert("Connection closed."); };
 ws.disconnect();
```

HTML 5 Features : What's Available .. And Where?

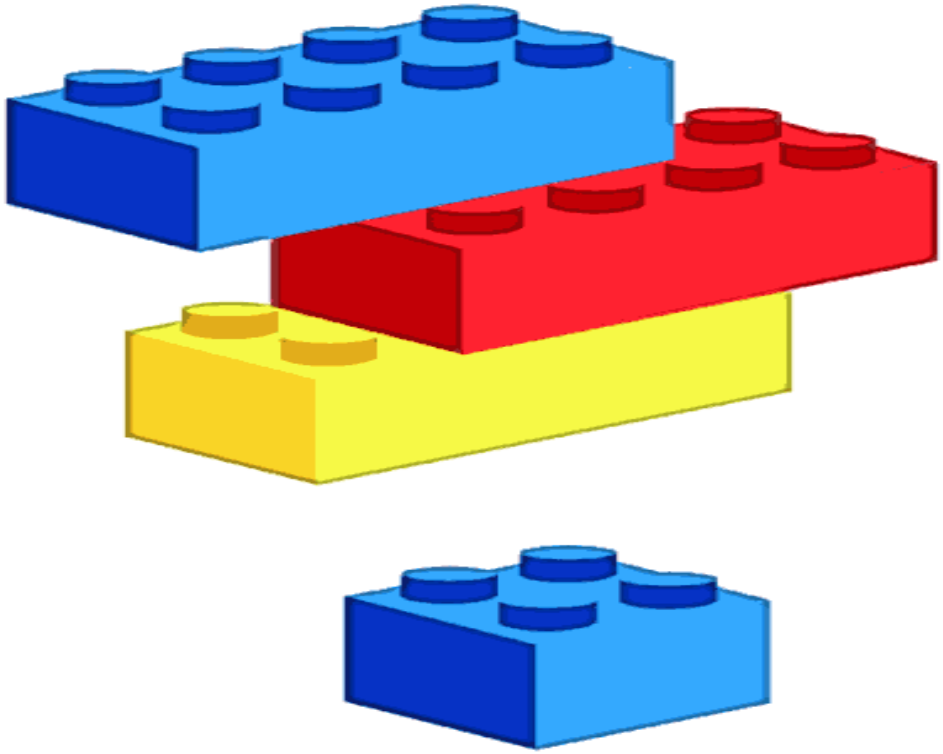
- http://html5test.com/
  - Will tell you what HTML5 features are available for the current browser.
  - http://weblogs.java.net/blog/rogerk/archive/2010/05/25/testing-html5-feature-availability-browsers

JSF 2.0 Component Model

JSF 2.0 Component Model

- Facelets is the foundation
  - Optimized for JSF
  - XHTML and tags
  - Eliminates translation/compilation
  - Templating
- Powerful tools:
  - Templating
  - Composite Components

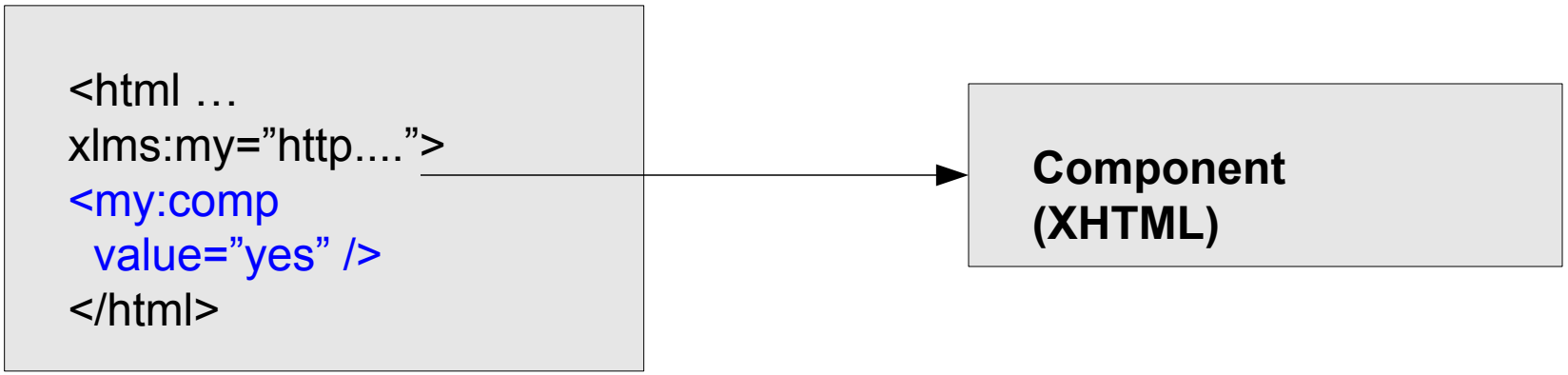
JSF 2.0 Composite Components



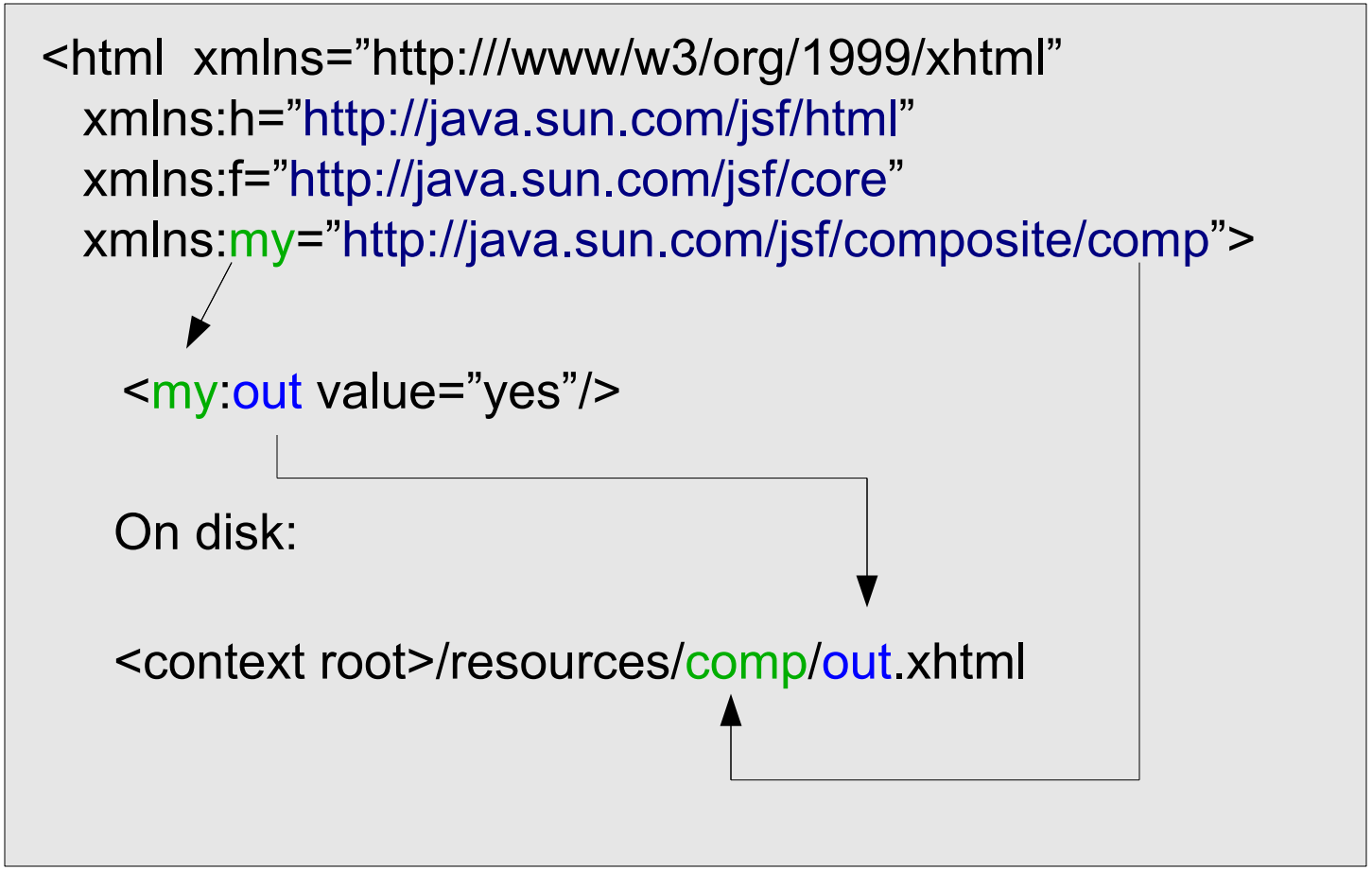
JSF 2.0 Composite Components

- True abstraction:
  - Reusable component
- Turns page markup into a JSF UI component with attached validators, converters, listeners

Using Page (XHTML)



JSF 2.0 Composite Components



JSF 2.0 Composite Components
What's Inside The Black Box?

- Interface
  - The usage contract
  - Everything page author needs to know to use component
- Implementation
  - Markup used to create component
  - How the component is implemented

JSF 2.0 Composite Components

<context-root>resources/ezcomp/LoginPanel.xhtml

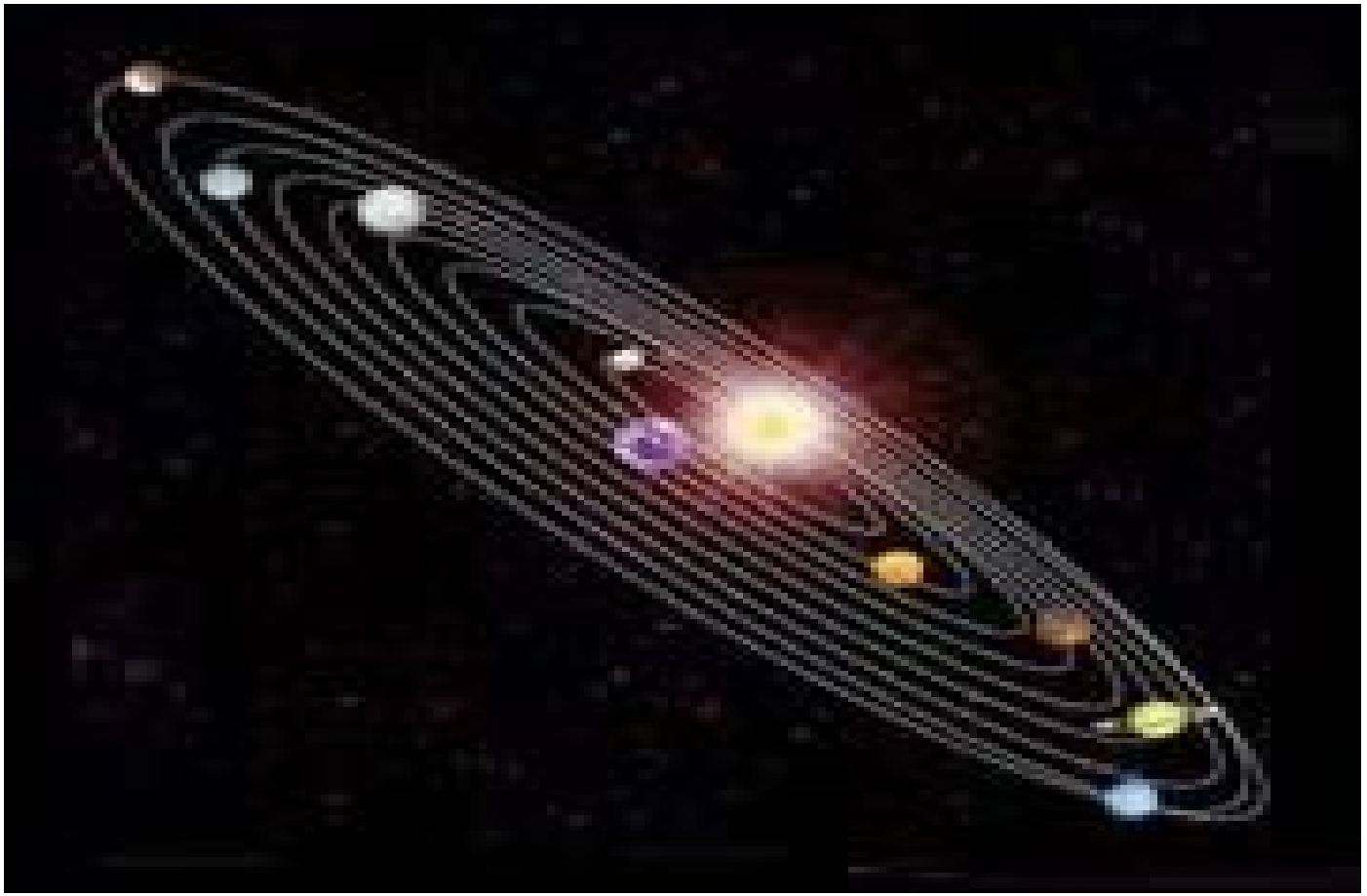
```
<html... xmlns:ui="http://java.sun.com/jsf/facelets"
  xmlns:cc="http://java.sun.com/jsf/composite">
…
<h:body>
  <cc:interface>
      <cc:attribute name=”userVal” required=”true” ”/>
      <cc:attribute name=”passValue” required=”true” />
      <cc:actionSource name="loginAction” targets=”loginButton” />
  </cc:interface>

  <cc:implementation>
    <div> Username:<h:inputText id=”userId”” value=”#{cc.attrs.userVal}”/> </div>
    <div>Password:<h:inputSecret id=”passId” value=”#{cc.attrs.passVal}”/></div>
     <div> <h:commandButton value=”Login” id=”loginButton” /> </div>
  </cc:implementation>
....
</h:body>
```

JSF 2.0 Composite Components

"Using" Page

```
<html...xmlns:ui="http://java.sun.com/jsf/facelets"
      xmlns:ez="http://java.sun.com/jsf/composite/ezcomp">
…
      <h:form>
         <div id="compositeComponent" class="grayBox"
           style="border: 1px solid #090;">
           <ez:loginPanel >
             <f:actionListener for=”loginAction” binding=”#{bean.action}” />
           </ez:loginPanel>
         </div>
         <p><h:commandButton value="reload" /></p>
       </h:form>
```

JSF 2.0 Composite Components With HTML 5



Enhancing JSF 2.0 Components
With HTML 5

- JSF 2.0 specification introduced JavaScript to promote Ajax
- Composite components work well with JavaScript
- Composite components can leverage the HTML 5 JavaScript API

Enhancing JSF 2.0 Components
With HTML 5

```
<html... xmlns:ui="http://java.sun.com/jsf/facelets" xmlns:h="http://java.sun.com/jsf/html"
   xmlns:f="http://java.sun.com/jsf/core" xmlns:cc="http://java.sun.com/jsf/composite">
<h:head> ... </h:head> …
<h:body>
  <cc:interface>
      <cc:attribute name=”src” required=”true” ”/>
      <cc:attribute name=”controls” required=”false” />
  </cc:interface>
<cc:implementation>
     <h:outputScript library=”js” name=”audio.js” target=”head”/>
     <audio src="#{cc.attrs.src}" controls="#{cc.attrs.controls}"></audio>
     <input type=”button” value=”Play” onclick=”play()”/>
     <input type=”button” value=”Pause” onclick=”pause()”/>
  </cc:implementation>
</h:body>
```

Enhancing JSF 2.0 Components
With HTML 5

audio.js:

```
function play() {
    var audio = document.getElementsByTagName("audio")[0];
    audio.play();
    var display = document.getElementsByTagName("input")[0];
    display.value = audio.src;
}

function pause() {
    var audio = document.getElementsByTagName("audio")[0];
    audio.pause();
}
```

Enhancing JSF 2.0 Components
With HTML 5

"Using" Page

```
<html... xmlns:ui="http://java.sun.com/jsf/facelets"
   xmlns:h="http://java.sun.com/jsf/html"
   xmlns:f="http://java.sun.com/jsf/core"
   xmlns:h5="http://java.sun.com/jsf/composite/media">
<h:head>
...
</h:head>
…
<h:body>
  ...
  <h5:audiobox src="resources/media/Lightson.ogg" controls="controls"/>
</h:body>
....
```

DEMOS
And let's look at some code...

What's Next?

- With respect to JSF:
  - JSF 2.0 Rev A (Minor Maintenance Release)
  - JSF 2.1 (Major Maintenance Release)
- We would like to hear from you!

Summary

- HTML 5
  - Really about markup **and** JavaScript API
- HTML 5 Features
  - Promote Rich User Interfaces
  - Graphics
  - Media
  - Multiprocessing
  - Communication
- JSF 2.0 Components work well with JavaScript
  - Leverage HTML 5 JavaScript APIs
- Future Directions

Resources

- http://glassfish.dev.java.net
- http://javaserverfaces.dev.java.net
- http://dev.w3.org/html5/spec/Overview.html
- http://dev.w3.org/html5/websockets
- http://grizzly.dev.java.net

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