

Agenda



- AJAX
- JSF and AJAX
- ajaxguessnumber
- Adding AJAX to address-book



AJAX

- Asynchronous Javascript and XMLHttpRequest
- Make web applications more responsive



Asynchronous vs Synchronous

- Synchronous means “at the same time”
- Asynchronous means the opposite
- In data processing:
 - Synchronous is blocking
 - Asynchronous is non-blocking



Synchronous vs Asynchronous

- Telephone call?
- Order at McDonalds?
- Order at regular restaurant?
- Email message?



Regular HTTP

- Regular HTTP is synchronous
 - Browser submits request
 - Browser waits for web page (the response)



Ajax

- Browser submits request
- Browser waits for web page (the response)
- Asynchronous part:
 - User actions can generate XMLHttpRequest calls
 - XMLHttpRequest responses used to update pieces of web page without http request



Without Ajax

1. Visit a Web page.
2. Fill in some data.
3. Press a button.
4. Wait.
5. Repeat from Step 1.



With Ajax

1. Visit a Web page.
2. Fill in some data (and the browser automatically submits just enough of it to do some work and update the web page).
3. Repeat Step 2.

SPA



- Ajax (+ HTML5) are used to create single page applications:
- One page initially loaded
- Ajax used to update the page during the use of the application without reloading or explicitly navigating

Simple Ajax Example (w3schools.com)



```
<!DOCTYPE html>
<html>
<body>

<div id="demo">
  <h2>Let AJAX change this text</h2>
  <button type="button" onclick="loadDoc()">Change Content</button>
</div>

</body>
</html>
```

Simple Example (cont'd)



```
function loadDoc() {  
    var xhttp = new XMLHttpRequest();  
    xhttp.onreadystatechange = function() {  
        if (this.readyState == 4 && this.status == 200) {  
            document.getElementById("demo").innerHTML = this.responseText;  
        }  
    };  
    xhttp.open("GET", "ajax_info.txt", true);  
    xhttp.send();  
}
```

For Our Applications



- For applications like the address-book, we would like to do validations asynchronously
- When the user types a badly-formed email address, the app should notify them immediately
- Client-side validation can be a security risk
- Ajax can help us emulate client-side validation on the server



ajaxguessnumber example

- Specify Ajax with <f:ajax> tag
- A simple web application that asks the user to guess a random number between 1 and 10
- Answers are checked without submitting the whole form and waiting for the page to reload
- For a new random number, need to reload the page



JSF and Ajax

- The component hierarchy on a JSF page is a serverside view in the form of a tree
- <f:ajax> tag encloses a discrete subtree of a complete serverside view

<f:ajax> attributes (we use first two)



- **execute**=*"space separated list of client ids, ValueExpression that evaluates to such a list, or a special keyword"*
- **render**=*"space separated list of client ids, ValueExpression that evaluates to such a list, or a special keyword"*
- **listener**=*"MethodExpression pointing to a method with signature*
void f(AjaxBehaviorEvent e)"
- **immediate**=*"true, false, or ValueExpression that evaluates to true or false"*
- **disabled**=*"true, false, or ValueExpression that evaluates to true or false. If true, the tag has no effect."*
- **event**=*"string that is one of the supported event names from next slide"*
- **onevent**=*"name (or ValueExpression that evaluates to name) of a JavaScript function that accepts one argument"*
- **onerror**=*"name (or ValueExpression that evaluates to name) of a JavaScript function that accepts one argument"*

Execute and render keywords



Keyword	Meaning When Used in execute	Meaning When Used in render
@all	Every component on the page is submitted and processed. This is useful when you want to do a full-page submit.	Every component on the page is rendered. This is useful when you just want to rerender the whole page asynchronously. This behavior is useful if you want to update the page and keep some client side state outside of JSF.
@none	Execute the lifecycle, including its phase listeners, but no components will be traversed.	Perform the Render Response phase, including firing any preRenderView events, but don't actually render anything.
@this	Submit and process only the component to which the <f:ajax> is applied.	Render only the component to which the <f:ajax> is applied.
@form	Submit and process the entire <h:form> in which the component that has the <f:ajax> is applied.	Render the entire <h:form> in which the component that has the <f:ajax> is applied.



event=<value> values

- HTML events

For example: click dblclick keydown
keypress keyup load mousedown
mousemove mouseout mouseover
mouseup unload blur change focus select

Add ajax to address-book



- Change the address-book application so the email address on the Edit page is validated with ajax (in class demo)
 1. Make Edit page navigate to edit page
 2. Make email address field validate with ajax
 3. Make email address field change in DB with ajax