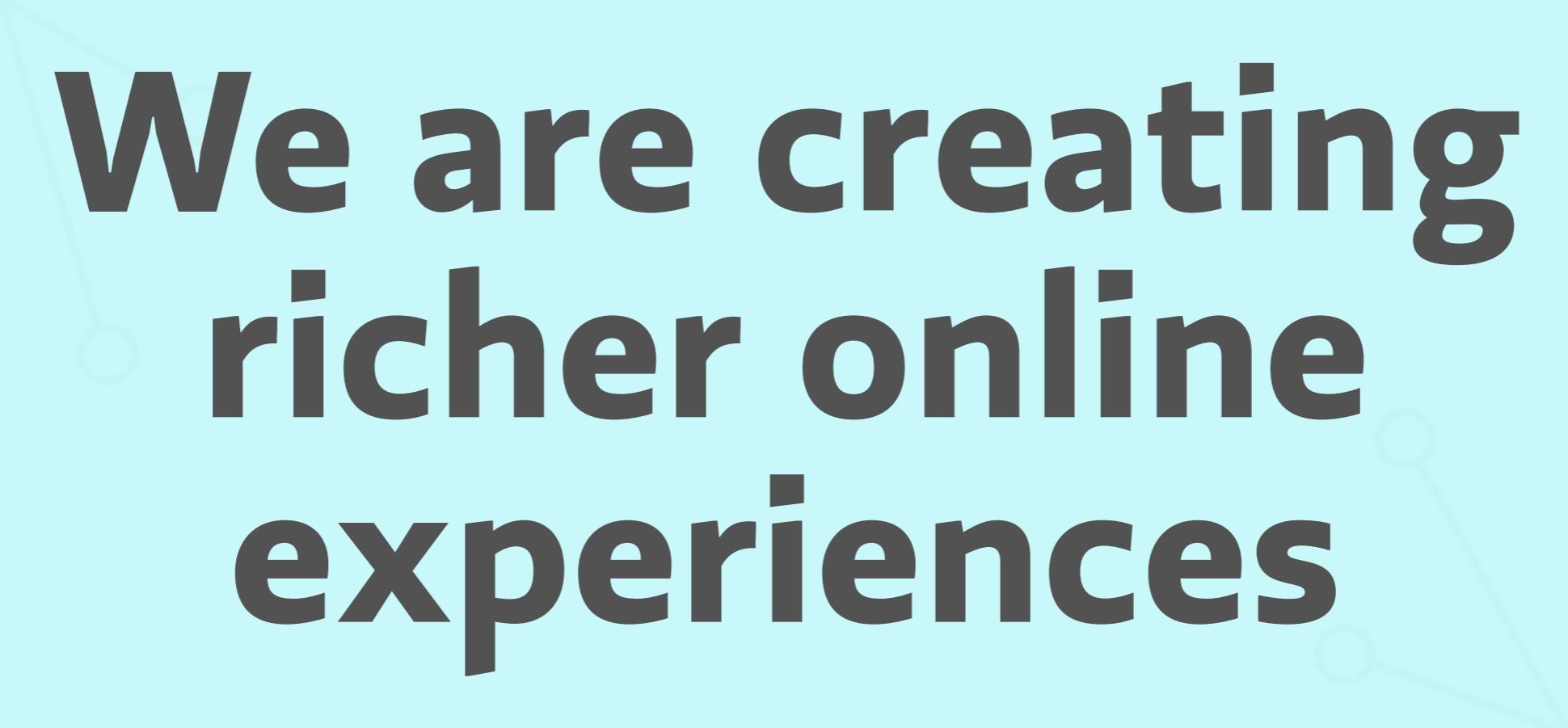


Progressive Enhancement with ARIA

Aaron Gustafson



easy designs



**We are creating
richer online
experiences**



A photograph of a young boy with blonde hair, wearing a blue baseball cap and a dark blue and white horizontally striped t-shirt. He is looking down at a yellow sign attached to a metal barrier. The sign has red text that reads "YOU MUST BE THIS TALL TO RIDE WITH AN ADULT". Below the text is a large red arrow pointing upwards. The boy is standing behind a metal railing, and his arm is visible on the left side of the frame, pointing towards the sign.

YOU MUST BE THIS TALL
TO RIDE WITH AN ADULT

...and the barriers
which prohibit them.

Accessibility is crucial



A color photograph of a man with white hair and glasses, wearing a white t-shirt with a small graphic, walking on a city sidewalk. He is using a white cane with a red tip to navigate his surroundings. In the background, there are buildings, a green awning for "HANS FAMILY MARKET", and other people walking. The foreground is dominated by a large, semi-transparent green rectangular overlay containing the text.

Google is a voracious consumer
of the web. And it's **blind**.



**But accessibility
isn't only about
supporting
screen readers.**

What if you can't use a mouse?



up to date now — both [here](#) and [here](#). Like most months I account for new user agents that come up this time with a new sightings in the "fun" category:

- Opera/9.00 (Nintendo Wii; U; ; 130D-9; en)
- Mozilla/5.0 (PLAYSTATION 3; 1.00)

[Wondering if that means I get to write off my Wii as a business loss?]

Comment

Categories: [web meta](#)

Tags: [browsers](#) [ps3](#) [statistics](#) [user agents](#) [web](#) [web development](#)

What if you don't see a change?



We can and must build better.

Building better

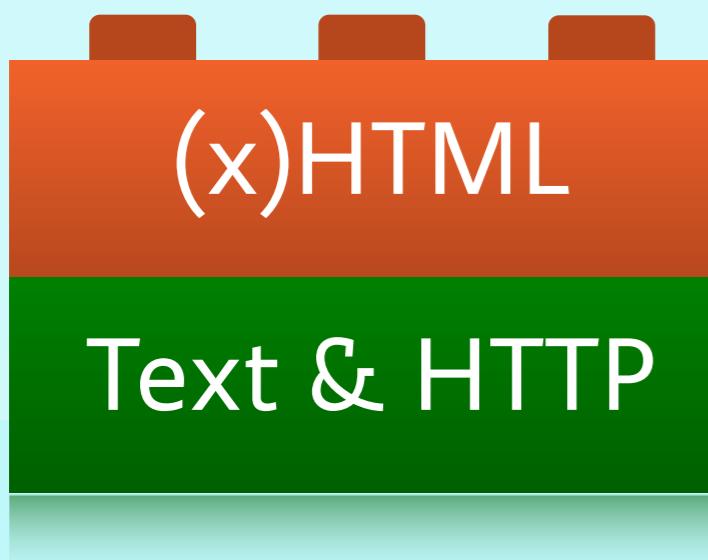
Every great experience on the web begins with two key things: clear, well-written prose and the HTTP protocol.



Text & HTTP

Building better

Semantics (markup) convey the underlying meaning of the content...
but if poorly applied, meaning can be obscured.



Building better

CSS can enhance usability through visual clues...
but it can also reduce accessibility if misused.



Building better



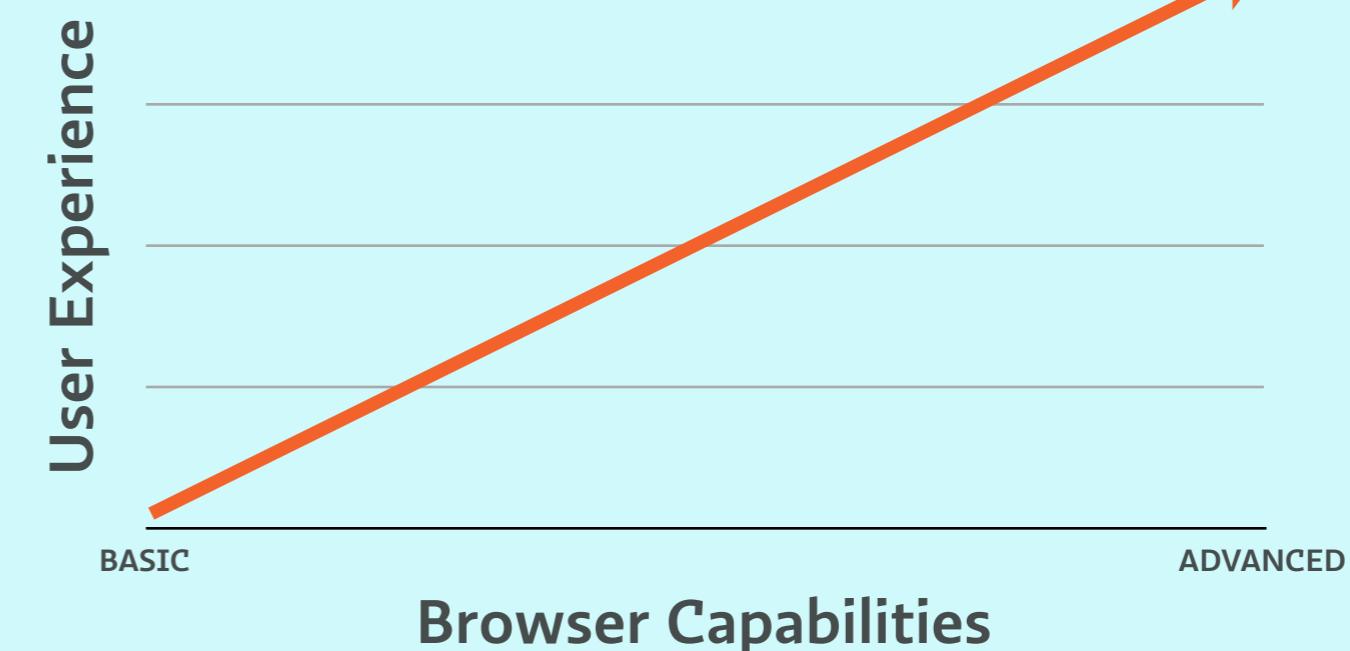
JavaScript can be used to build more intuitive interfaces... but it cannot be relied on 100% of the time.

Building better



WAI-ARIA extends the semantics of the document to provide additional insight into the state of the interface and how to interact with it.

Progressive Enhancement

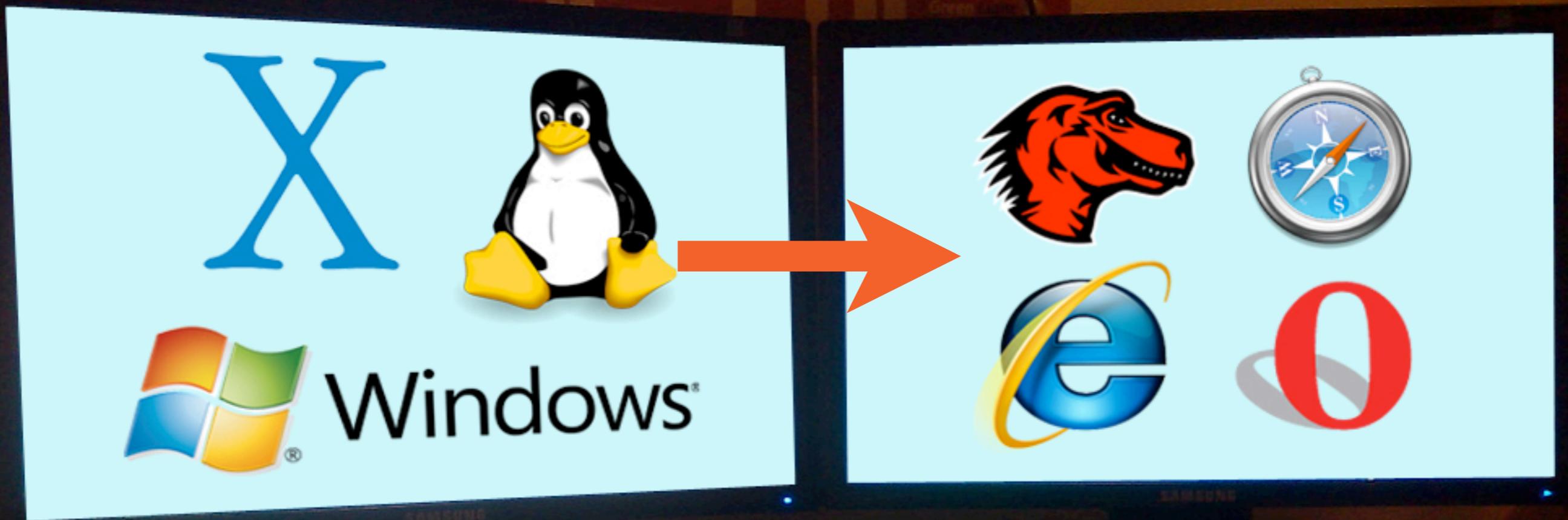


WAI-ARIA is a new(ish) tool





Semantics+



Map OS concepts to the web





<http://tinyurl.com/cwyvny>
<http://habilis.net/validator-sac/>



Call attention to important pieces

Structural Roles

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SPEAKERS


Faruk Ateş
<http://farukat.es>
Faruk Ateş is a User Experience consultant who independently practices design, development, writing and advocating web standards. He's the original creator of *Modernizr*, a tool to help people take advantage of HTML5 and CSS3 today, and he spends a lot of time trying to push the envelope in what browsers can do.


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Topics and schedule

Session	Length	Topics
1st Session	1 hour	Highly Maintainable, Efficient and Optimised CSS Zoe Mickley Gillenwater In this session, we'll go over the key elements that make it easier for a team to work on a project's CSS together, also important for freelancers handing markup and CSS back to their clients. We'll also cover how to streamline and optimise your CSS to help reduce unnecessary repetition and improve page performance.
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Home Mission Events Team Projects Jobs Contact Blog

The HTML & CSS
ONLINE CONFERENCE

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} role="banner"

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role="main"

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role="navigation"

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role="article"

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role="complementary"

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role="list"

Structural Roles

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Using a progressive enhancement approach to the presentation of this slide, the speaker has used the role="listitem" ARIA role to identify the list items in the 'Topics and schedule' table.

role="listitem"

Structural Roles



Zoe Mickley Gillenwater
<http://zomigi.com>

Zoe Mickley Gillenwater is a freelance graphic and web designer, developer and consultant. She is the author of two books on CSS, *Stunning CSS3: A Project-based Guide to the Latest in CSS and Flexible Web Design: Creating Liquid and Elastic Layouts with CSS*, as well as the video training title *Web Accessibility Principles* for [lynda.com](#). Zoe is currently a member of the Web Standards Project (WaSP) Adobe Task Force and was previously a moderator of the popular css-discuss mailing list.

		you're familiar with to build impressive online businesses without back-end coding.
Break	15 mins	Stretch your legs & grab a coffee (or dinner if it's that time of day for you).
3rd Session	1 hour	The Why, How, and When of CSS Frameworks Nathan Smith CSS frameworks can help expedite a site building project. But they certainly aren't a one-size-fits-all solution. No technology is a magic bullet. CSS, like any other code language, must be wielded appropriately in order to be effective. This talk will explain some of the things to consider when choosing a CSS framework: "Should I use a framework? If so, which one? How do I use it? How I make my own?"
4th Session	1 hour	Progressive Enhancement with ARIA Aaron Gustafson Designing and developing with accessibility in mind has numerous benefits: it makes your website usable by everyone, it makes your content inherently more search engine friendly, and it makes providing context-sensitive interfaces (e.g. mobile) even easier. In this session, Aaron Gustafson will provide you with a quick refresher on progressive enhancement and show you where the Web Accessibility Initiative's Accessible Rich Internet Applications (WAI-ARIA) spec fits into it all. Throughout the talk, Aaron will provide numerous examples of how to weave ARIA into your projects and how to use ARIA, in concert with JavaScript, to dramatically enhance the usability of client-side widgets.

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role="form"

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[role="contentinfo"]

Structural Roles

Document Structure

article
columnheader
definition
directory
document
group

heading
img
list
listitem
math
note

presentation
region
row
rowheader
separator

Landmarks

application
banner
complementary

contentinfo
form
main

navigation
search

Explain what something is & how it works



Widget Roles

```
<span role="button">OK</span>
```

(of course `<button>OK</button>` would be better)

```
<div role="alert">
  <p>Something went wrong.</p>
</div>
```

```
<div role="alertdialog">
  <p>Something went wrong.</p>
  
</div>
```

Widget Roles

alert
alertdialog
button
checkbox
combobox
dialog
gridcell
link
log

marquee
menuitem
menuitemcheckbox
menuitemradio
option
progressbar
radio
radiogroup
scrollbar

slider
spinbutton
status
tab
tabpanel
textbox
timer
tooltip
treeitem

Widget Container Roles

grid
listbox
menu

menubar
tablist
toolbar

tree
treegrid

Widget Properties

aria-activedescendant
aria-atomic
aria-autocomplete
aria-controls
aria-describedby
aria-dropeffect
aria-flowto
aria-haspopup
aria-label
aria-labelledby
aria-level
aria-live

aria-multiline
aria-multiselectable
aria-orientation
aria-owns
aria-posinset
aria-readonly
aria-relevant
aria-required
aria-setsize
aria-sort
aria-valuemax
aria-valuemin

Indicate what's going on



Widget States



(off)



(on)

```
<button>
  
</button>
```

```
<button>
  
</button>
```

Widget States



(off)



(on)

```
<button>
  
</button>
```

```
<button>
  
</button>
```

Widget States



(off)

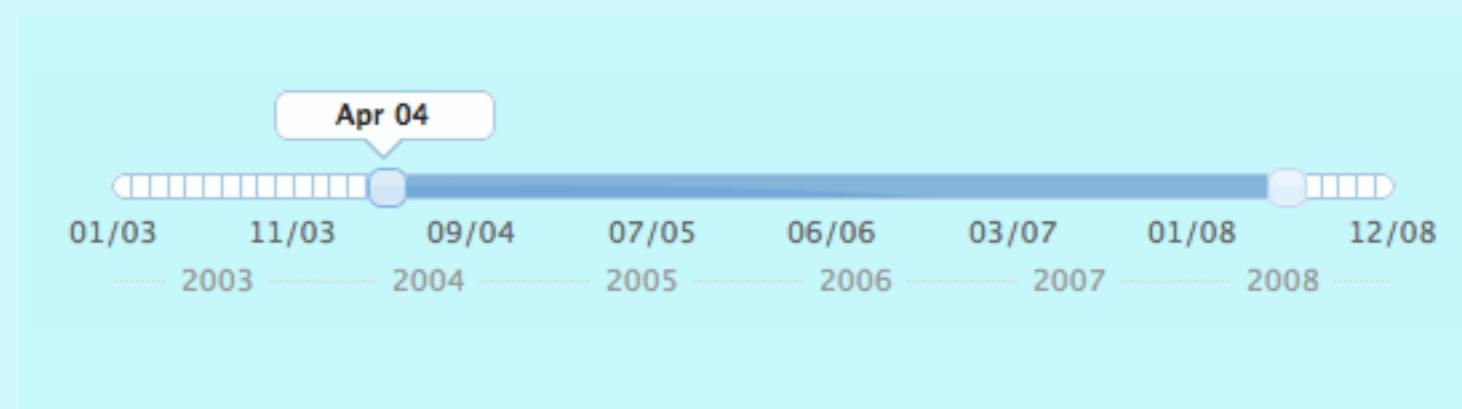


(on)

```
<button role="button" aria-pressed="false">
  
</button>
```

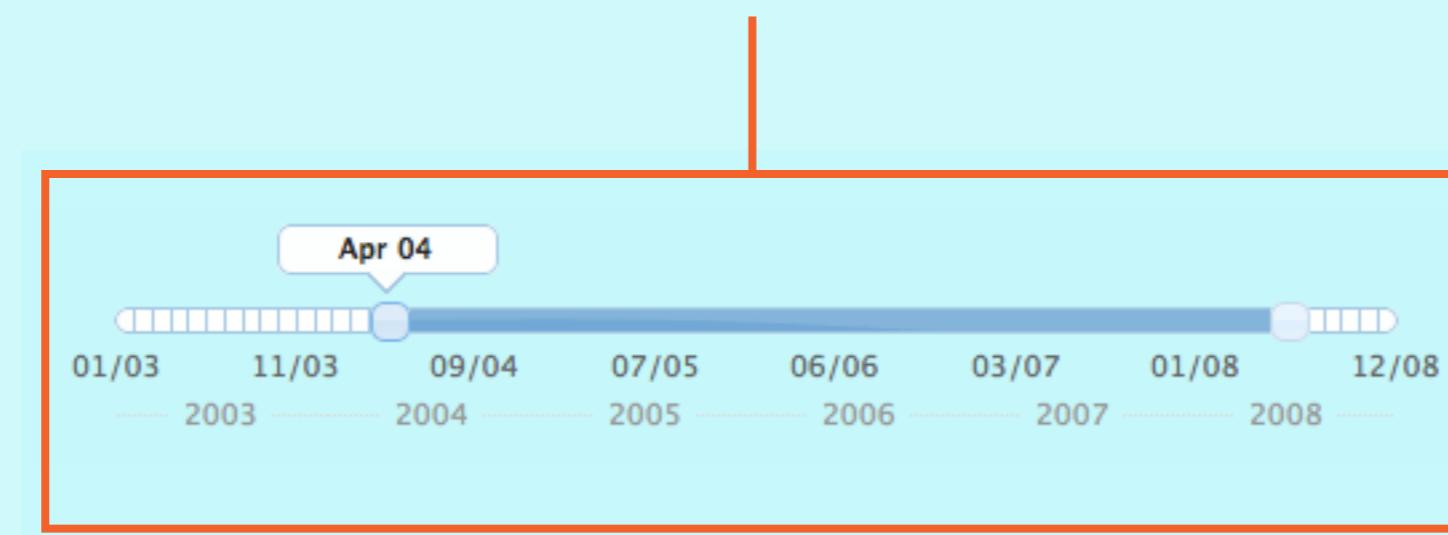
```
<button role="button" aria-pressed="true">
  
</button>
```

Complex Widgets

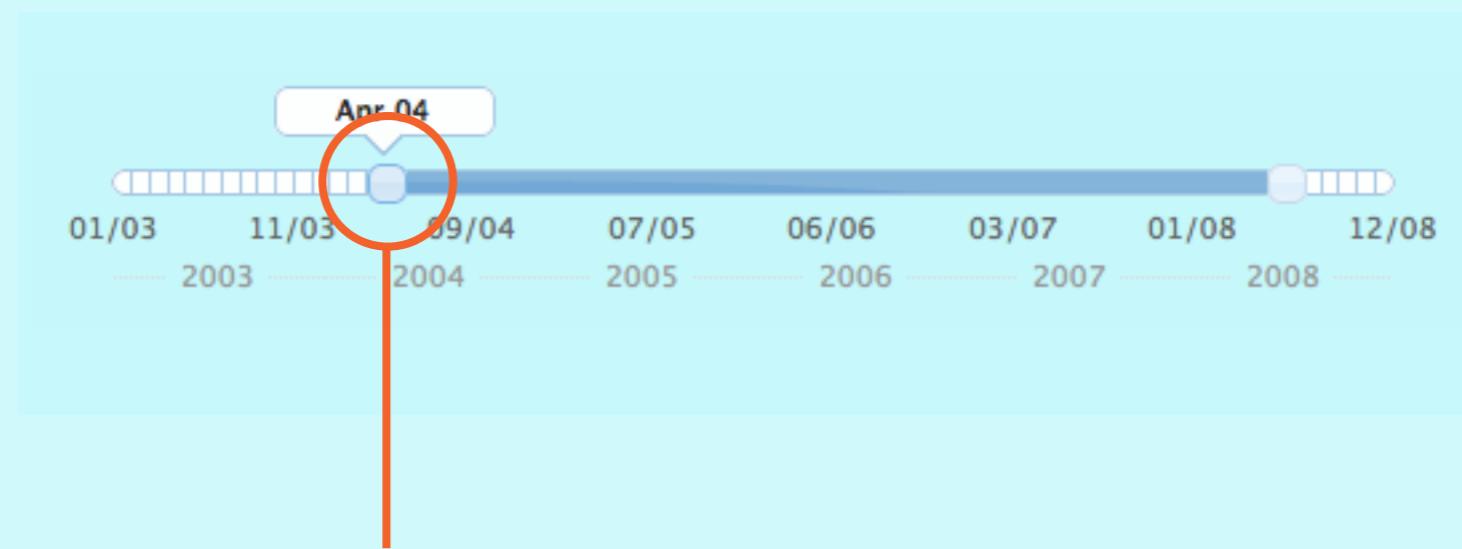


Complex Widgets

role="application"

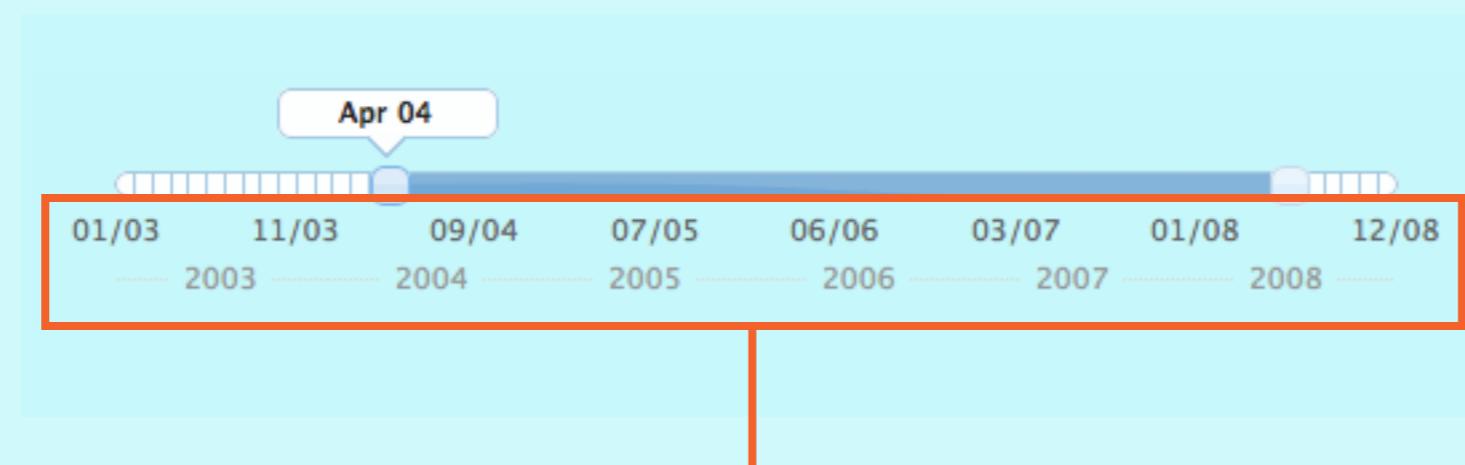


Complex Widgets



```
role="slider"
aria-labelledby="label_handle_valueA"
aria-valuemin="0"
aria-valuemax="71"
aria-valuenow="22"
aria-valuetext="Apr 04"
```

Complex Widgets



role="presentation"

Widget States

`aria-busy`

`aria-checked`

`aria-disabled`

`aria-expanded`

`aria-grabbed`

`aria-hidden`

`aria-invalid`

`aria-pressed`

`aria-selected`

`aria-valuenow` (the W3C defines this as a “property”)

`aria-valuetext` (ditto)



Highlight “living” content

Live Regions

What's happening? 140

Latest: wishes @andybudd a very happy birthday! about 7 hours ago [Tweet](#)

Live Regions

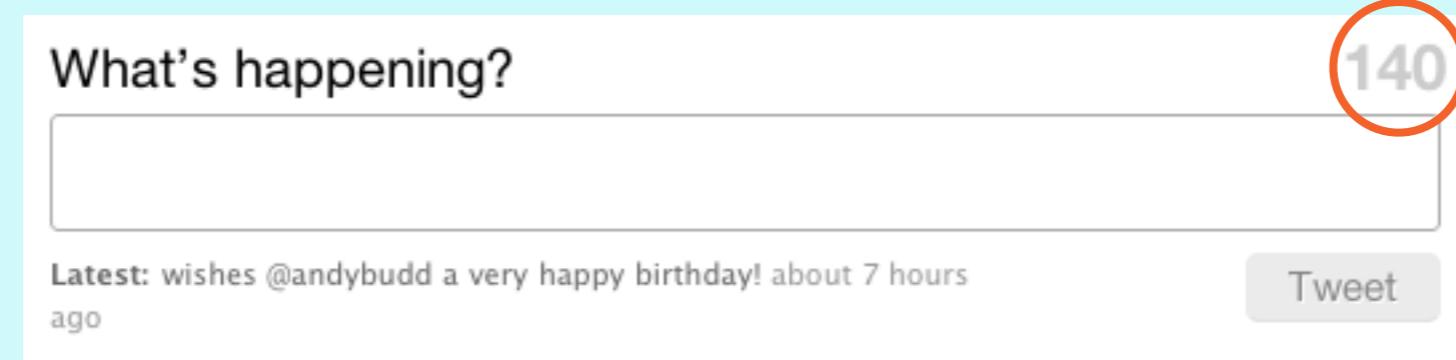
What's happening?

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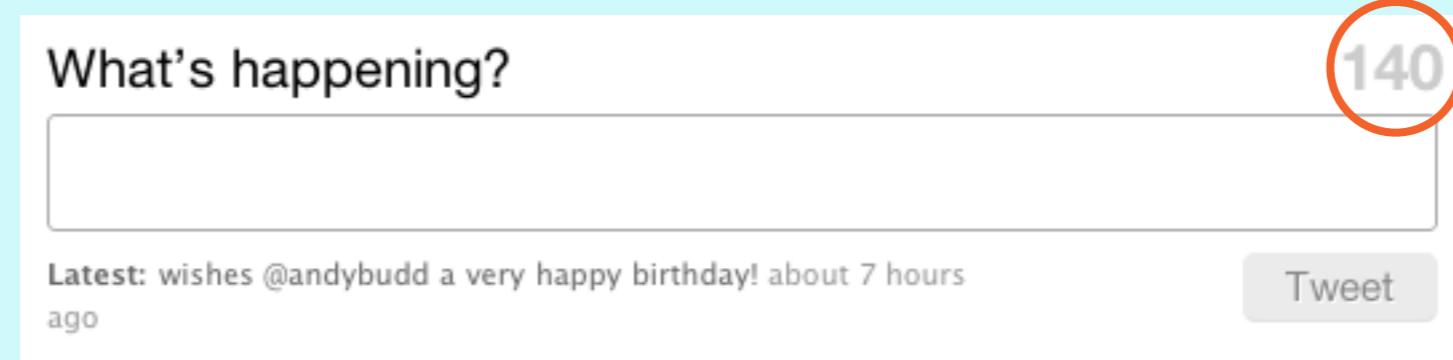


Live Regions



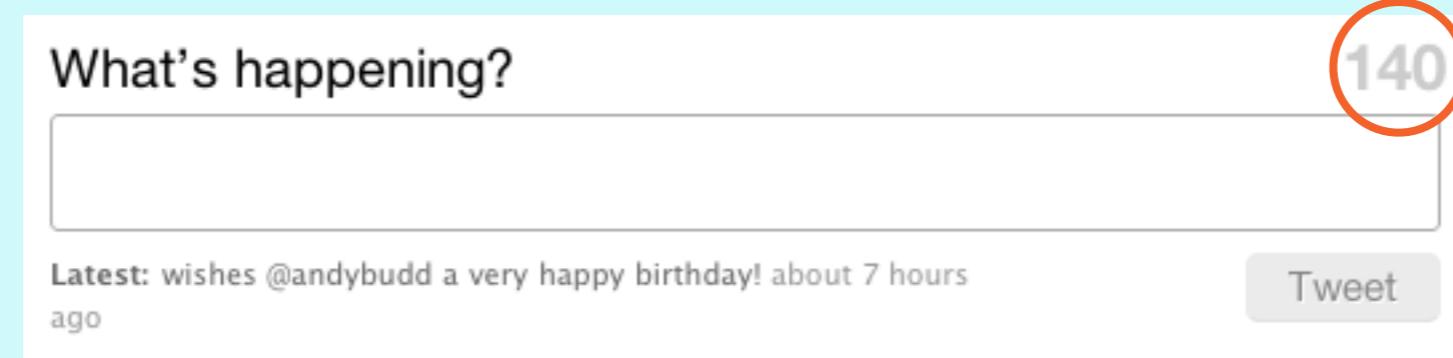
```
<span id="chars_left_notice" class="numeric">
  <strong id="status-field-char-counter"
    class="char-counter">140</strong>
</span>
```

Live Regions



```
<span id="chars_left_notice" class="numeric"
      aria-live="polite">
  <strong id="status-field-char-counter"
         class="char-counter">140</strong>
</span>
```

Live Regions



```
<span id="chars_left_notice" class="numeric"
      aria-live="polite">
  <strong id="status-field-char-counter"
         class="char-counter">140</strong>
  characters left
</span>
```

Notification Options

off

change not announced

polite

change announced after user completes her current activity

assertive

user agent should interrupt the user's activity, but not immediately

rude

user agent should interrupt the user's activity immediately

Manage focus with slight-of-hand



tabindex helps manage focus

```
<div tabindex="0">
  <p>This <code>div</code> can now receive focus
using a keyboard's <kbd>tab</kbd> key. How cool
is that?</p>
</div>

<div tabindex="-1">
  <p>This <code>div</code> won't be focused by a
user via the <kbd>tab</kbd> key, but JavaScript
can <code>focus()</code> it. Nifty, huh?</p>
</div>
```



Piecing it all together

Let's Build a Tabbed Interface

Pumpkin Pie

[OVERVIEW](#)[INGREDIENTS](#)[DIRECTIONS](#)[NUTRITION](#)

Whether you're hosting a festive party or a casual get-together with friends, our Pumpkin Pie will make entertaining easy!

Original recipe yield: 1 × 9-inch deep dish pie

Prep Time: 10min

Cook Time: 1hr

Ready In: 1hr 10min



Traditional approach

```
<h1>Pumpkin Pie</h1>
<div class="container">
  <div class="section">
    <h2>Overview</h2>
    
    <p>Whether you're hosting a festive party or a casual
       get-together with friends, our Pumpkin Pie will make
       entertaining easy!</p>
    ...
  </div>
  ...
<ul class="tabs">
  <li><a href="#">Overview</a></li>
  <li><a href="#">Ingredients</a></li>
  <li><a href="#">Directions</a></li>
  <li><a href="#">Nutrition</a></li>
</ul>
</div>
```

Static HTML with no style

Pumpkin Pie

Overview



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1 x 9-inch deep dish pie

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10min

Cook Time

1hr

Ready In

1hr 10min

Ingredients

A little typography

Pumpkin Pie

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INGREDIENTS

1 (9in) unbaked deep dish pie crust
½ cup white sugar
1 tsp ground cinnamon
½ tsp salt
½ tsp ground ginger
¼ tsp ground cloves
2 eggs
1 can (15oz) pumpkin puree
1 can (12fl oz) evaporated milk

Typography and color

Pumpkin Pie

OVERVIEW

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Taking another look

Pumpkin Pie

Overview



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1hr 10min

Ingredients

Taking another look

Pumpkin Pie

Overview



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1hr 10min

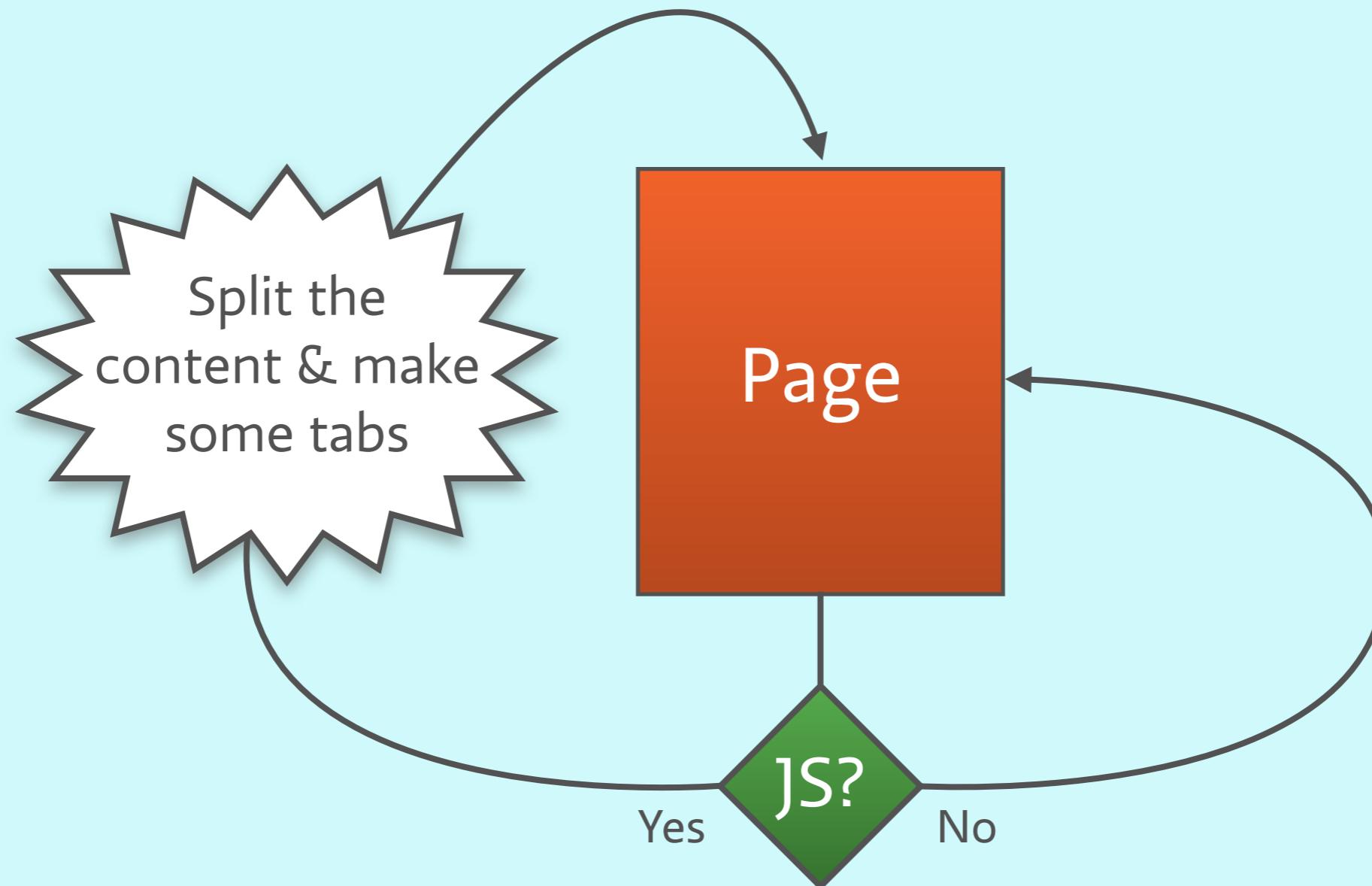
Ingredients

.tabbed

Required source

```
<h1>Pumpkin Pie</h1>
<div class="tabbed">
  <h2>Overview</h2>
  
  <p>Whether you're hosting a festive party or a casual
  get-together with friends, our Pumpkin Pie will make
  entertaining easy!</p>
  ...
  <h2>Ingredients</h2>
  <ul>
    <li>1 (9<abbr title="inch">in</abbr>) unbaked deep
        dish pie crust</li>
    <li>½ cup white sugar</li>
    ...
  </ul>
  <h2>Directions</h2>
  ...
</div>
```

Understanding the flow



Mouse-based interaction

Pumpkin Pie

OVERVIEW INGREDIENTS DIRECTIONS NUTRITION

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Photo by [Paul Goyette](#), licensed under [Creative Commons](#).

Assigning ARIA Roles

Pumpkin Pie

[OVERVIEW](#)[INGREDIENTS](#)[DIRECTIONS](#)[NUTRITION](#)

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Assigning ARIA Roles

Pumpkin Pie

OVERVIEW INGREDIENTS DIRECTIONS NUTRITION

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A photograph of a single slice of pumpkin pie. The pie has a golden-brown crust and a vibrant orange filling. It is topped with a dollop of white whipped cream. The slice is presented on a white plate.

`role="application"
aria-activedescendant="folder-1"`

Assigning ARIA Roles

Pumpkin Pie

OVERVIEW INGREDIENTS DIRECTIONS NUTRITION

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Ready In: 1hr 10min



role="tabpanel"
aria-hidden="false"
aria-labelledby="folder-1-tab"

Assigning ARIA Roles

role="tablist"

Pumpkin Pie

OVERVIEW

INGREDIENTS

DIRECTIONS

NUTRITION

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Assigning ARIA Roles

`role="tab"
aria-selected="false"
aria-describedby="folder-4"`

Pumpkin Pie

OVERVIEW

INGREDIENTS

DIRECTIONS

NUTRITION

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Cook Time: 1hr

Ready In: 1hr 10min



Assigning ARIA Roles

`role="tab"
aria-selected="true"
aria-describedby="folder-1"`

Pumpkin Pie

OVERVIEW

INGREDIENTS

DIRECTIONS

NUTRITION

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Prep Time: 10min

Cook Time: 1hr

Ready In: 1hr 10min



Updating states and properties

```
tab.onclick    = swap;  
  
// ...  
  
function swap( e ){  
  // ...  
  old_tab.setAttribute( 'aria-selected', 'false' );  
  // ...  
  tab.setAttribute( 'aria-selected', 'true' );  
  // ...  
  old_folder.setAttribute( 'aria-hidden', 'true' );  
  // ...  
  new_folder.setAttribute( 'aria-hidden', 'false' );  
  // ...  
  _cabinet.setAttribute( 'aria-activedescendant', _active );  
}
```

Enabling the keyboard

```
tab.onclick    = swap;  
tab.onkeydown = moveFocus;  
tab.onfocus    = swap;
```

Enabling the keyboard

Pumpkin Pie

[OVERVIEW](#)[INGREDIENTS](#)[DIRECTIONS](#)[NUTRITION](#)

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Enabling the keyboard

tabindex="-1"

Pumpkin Pie

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Enabling the keyboard

tabindex="0"

Pumpkin Pie

OVERVIEW

INGREDIENTS

DIRECTIONS

NUTRITION

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Cook Time: 1hr

Ready In: 1hr 10min



Enabling the keyboard

```
function moveFocus( e ) {  
  e = ( e ) ? e : event;  
  var tab  = e.target || e.srcElement,  
      key   = e.keyCode || e.charCode,  
      pass  = true;  
  tab  = getTab( tab );  
  
  // keyboard handling goes here  
  
  if ( ! pass )  
  {  
    return cancel( e );  
  }  
}
```

Enabling the keyboard

```
function getTab( tab )
{
  while ( tab.nodeName.toLowerCase() != 'li' )
  {
    tab = tab.parentNode;
  }
  return tab;
}
```

Enabling the keyboard

```
function moveFocus( e ) {  
    // ...  
    switch ( key ) {  
        case 37: // left arrow  
        case 38: // up arrow  
            move( tab, 'previous', false );  
            pass = false;  
            break;  
        // down (39), right (40), home (36), end (35)  
        // should be added here  
        case 27: // escape  
            tab.blur();  
            pass = false;  
            break;  
    }  
    // ...  
}
```

Enabling the keyboard

```
function move( tab, direction, complete ) {  
  if ( complete ) {  
    if ( direction == 'previous' ) {  
      tab.parentNode.childNodes[0].focus();  
    } else {  
      tab.parentNode  
        .childNodes[tab.parentNode  
          .childNodes.length-1].focus();  
    }  
  } else {  
    var target = direction == 'previous' ? tab.previousSibling  
      : tab.nextSibling;  
    if ( target ) {  
      target.focus();  
    }  
  }  
}
```

Enabling the keyboard

```
function swap( e ){
    // ...
    old_tab.setAttribute( 'aria-selected', 'false' );
    old_tab.setAttribute( 'tabindex', '-1' );
    // ...
    tab.setAttribute( 'aria-selected', 'true' );
    tab.setAttribute( 'tabindex', '0' );
    // ...
    old_folder.setAttribute( 'aria-hidden', 'true' );
    old_folder.setAttribute( 'tabindex', '-1' );
    // ...
    new_folder.setAttribute( 'aria-hidden', 'false' );
    new_folder.setAttribute( 'tabindex', '0' );
    // ...
}
```

The Fruit (Pie) of Our Labor

Pumpkin Pie

[OVERVIEW](#)[INGREDIENTS](#)[DIRECTIONS](#)[NUTRITION](#)

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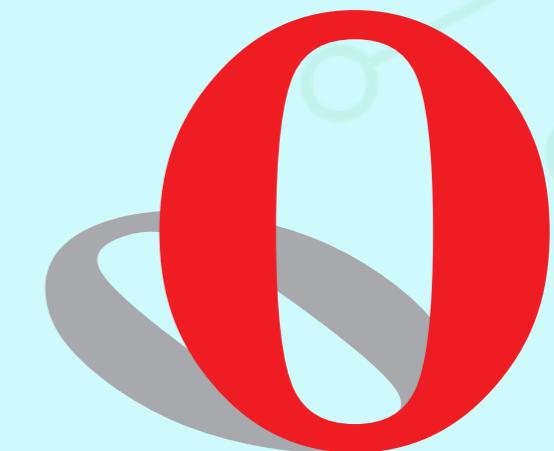
Cook Time: 1hr

Ready In: 1hr 10min



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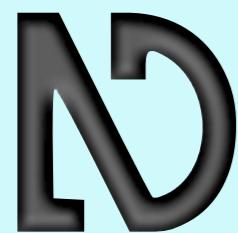
Who is Supporting WAI-ARIA?



YAHOO!

Adobe

Google



dōjō 

For More

WAI-ARIA Spec

w3.org/TR/wai-aria/

WAI-ARIA Support in Browsers

paciellogroup.com/blog/aria-tests/ARIA-SafariaOperaIEFF.html

TabInterface

easy-designs.github.com/tabinterface.js/

Progressive Enhancement with ARIA

Aaron Gustafson



easy designs

Slides available at
<http://slideshare.net/AaronGustafson>

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