

Why ARIA?

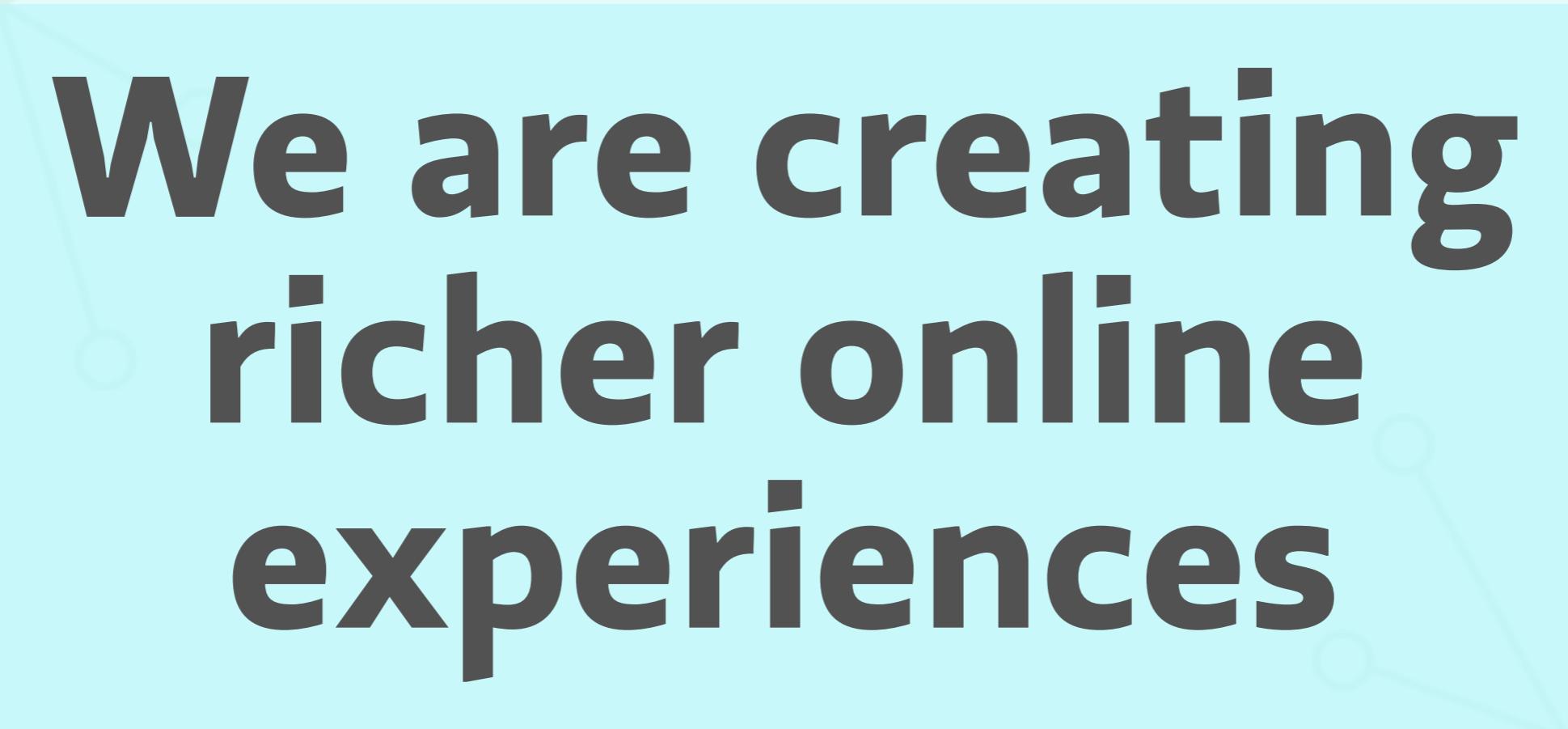
or

Why should I bother to make my website accessible?

Aaron Gustafson



easy designs



**We are creating
richer online
experiences**



A photograph of a young boy with light brown hair, wearing a blue baseball cap and a dark blue and white horizontally striped t-shirt. He is leaning forward, looking down at a yellow and white height restriction sign. The sign features a large red arrow pointing upwards and the text "YOU MUST BE THIS TALL TO RIDE WITH AN ADULT". The background shows a metal fence and some foliage.

YOU MUST BE THIS TALL
TO RIDE WITH AN ADULT

...and the barriers
which prohibit them.

Accessibility is crucial



A photograph of a man with white hair and glasses, wearing a white t-shirt with a blue diamond logo, walking on a city sidewalk. He is using a long white cane with a red tip to navigate his surroundings. In the background, there are buildings, a green awning for "HANS FRESH MARKET", and other people walking. The image has a green overlay at the top.

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; ; 1309-9; 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

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.

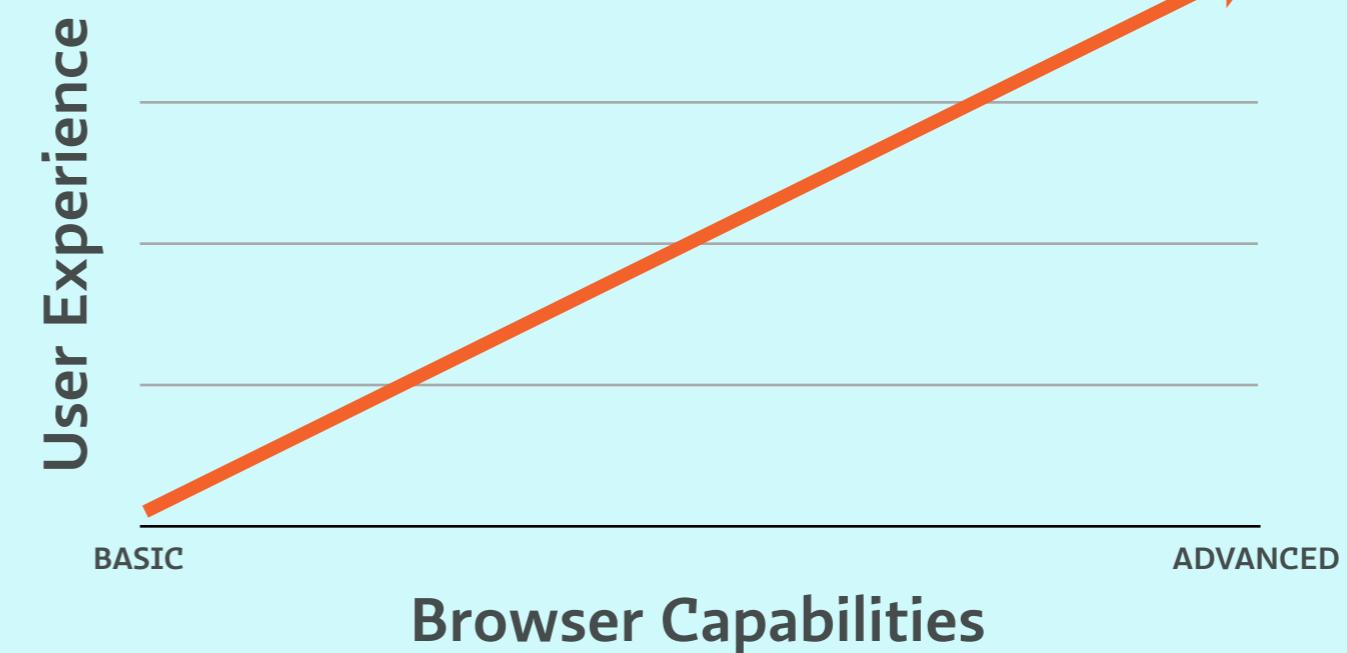


Building better



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

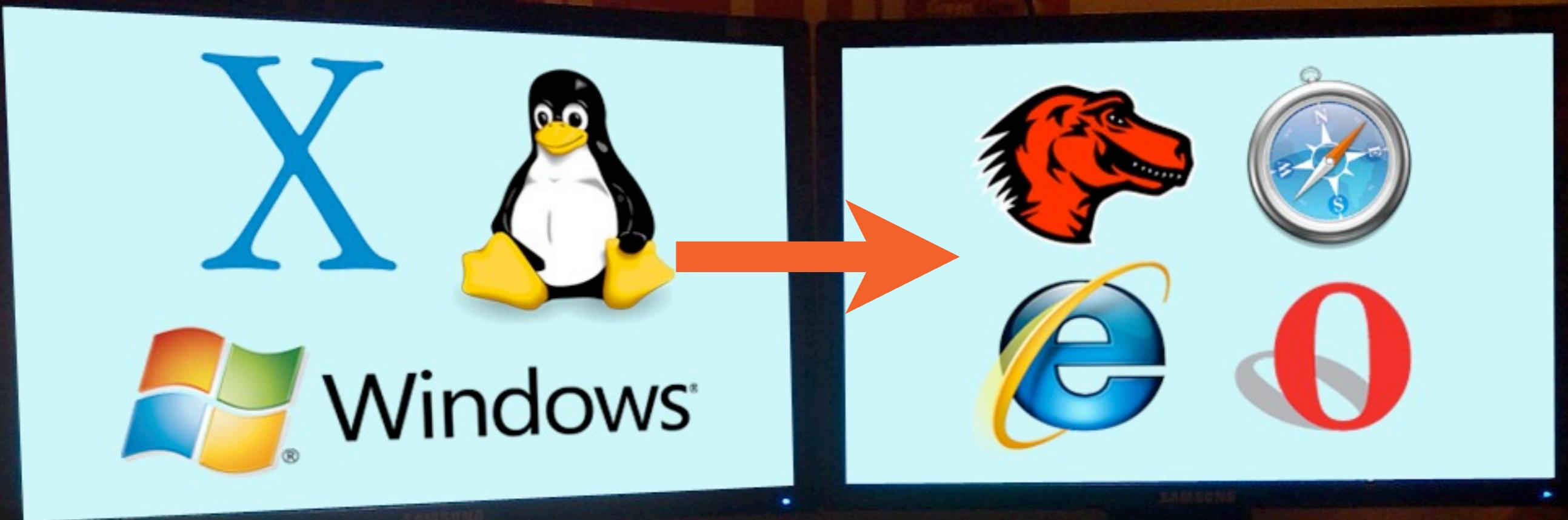


WAI-ARIA is a new(ish) tool





Semantics+



Map OS concepts to the web



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



Call attention to important pieces

Structural Roles

[Register To Present] [View Schedule]

Dev(Chatt)

MARCH 26-27 | CHATTANOOGA, TN

Dev(Chatt) is a free, technology focused conference and expo for software developers, engineers, technologists and technology enthusiasts. Combining the best approaches from the unconference movement and more traditional conferences, Dev(Chatt) is both a place for attendees to grow their knowledge and to educate each other.

KEYNOTE SPEAKER

Jacob Kaplan-Moss
<http://www.djangoproject.com>
Jacob Kaplan-Moss is one of the lead developers and co-creator of django. Jacob's an experienced software developer with a focus on web application architecture. He's a consultant with Revolution Systems, where he helps companies deploy and scale websites using Python and django. Jacob previously worked for the Lawrence Journal-World, a locally-owned newspaper in Lawrence, Kansas, where he helped develop and eventually open source django.

PRE-DEVCHATT SPEAKER

Chris Mills
Chris Mills is a developer relations manager for Opera – he edits and publishes articles on dev.opera.com and labs.opera.com, liaises with the community to raise awareness of Opera and collect feedback, and evangelizes about Opera software wherever he can. He is also the organizer and editor of the Opera Web Standards Curriculum.
Chris will be speaking at Pre-DevChatt on Friday, March 19 at 11:30 at the NYC Fine Arts Center. [Buy Now](#) to attend (and for lunch!).

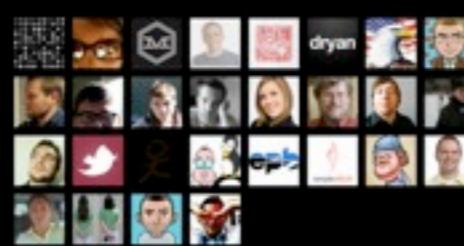
CONFERENCE FORMAT

Taking a cue from the successful BarCamp Chattanooga, sessions will be held on both days with multiple concurrent tracks. Topics will be determined by the speakers and posted prior to the conference. Speaker registration is online. Attendee registration is day-of (and free). In the case that there are more topics registered than space permits, presentation time slots will be assigned on a first come first served basis.

- The conference is free to attend and free to present.
- Community Presentations are 45 minutes in length
- Register to present [here](#)
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- Presentations begin Friday, March 26th at 6:00 pm and continue through 9:00pm
- Presentations continue Saturday, March 27th at 9:00 am and continue through 3:30pm
- The keynote address will be on Saturday, March 27th at 3:30pm

THE PRESENTERS

dryan



Interested in presenting? [Register Here!](#)

}] role="banner"

Structural Roles

[Register To Present] [View Schedule]

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THE PRESENTERS

dryan

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role="main"

Structural Roles

The screenshot shows the homepage of the DevChatt website. At the top right, there are two buttons: "Register to Present" and "View Schedule". The "Register to Present" button is circled in red, with a red arrow pointing from it to the text "role='navigation'" located on the right side of the slide.

Dev(Chatt) ■ MARCH 26-27 | CHATTANOOGA, TN

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role="navigation"

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THE PRESENTERS



Interested in presenting? [Register Here!](#)

role="article"

Structural Roles

The screenshot shows the DevChatt website with a dark background. At the top, there's a navigation bar with links for "Register to Present" and "View Schedule". The main title "Dev(Chatt)" is displayed prominently. Below the title, it says "MARCH 26-27 | CHATTANOOGA, TN". A brief description follows: "Dev(Chatt) is a free, technology focused conference and expo for software developers, engineers, technologists and technology enthusiasts. Combining the best approaches from the unconference movement and more traditional conferences, Dev(Chatt) is both a place for attendees to grow their knowledge and to educate each other." Two speaker profiles are shown: "KEYNOTE SPEAKER" Jacob Kaplan-Moss and "PRE-DEVCHATT SPEAKER" Chris Mills. Below these, under "THE PRESENTERS", is a grid of 25 small profile pictures of speakers. An orange rectangle highlights this grid. At the bottom left, there's a section titled "CONFERENCE FORMAT" with details about the event's schedule and registration. At the bottom right, there's a link "Interested in presenting? [Register Here]".

role="list"
(but hopefully you used a **ul** or **ol**)

Structural Roles

The screenshot shows the DevChatt website. On the left, there is a registration form titled "REGISTER" with fields for Name, Email Address, Twitter Address (with the value "http://twitter.com/"), and Website. A "Submit" button is at the bottom. An orange box highlights the entire registration form area. To the right of the form is a sidebar with the heading "#DEVCHATT". It contains several tweets from the user "rt_benbarnet" (@benbarnet) about the conference. Below the tweets, there is a link to the schedule: "http://devchatt.org/schedule/". At the bottom of the sidebar, there is a note: "All rights reserved. © 2010 DevChatt. All Rights Reserved. Site by Medium. For more information, contact us at info@devchatt.org".

role="form"

Structural Roles

The screenshot shows the DevChatt website. At the top left is a registration form with fields for Name, Email Address, Twitter Address (set to <http://twitter.com/>), and Website. To the right is a map with pins and a button labeled "VIEW THE CONFERENCE SCHEDULE AND MAP". Below the registration form is a section titled "SPONSORS" featuring logos for Chattanooga Technology Council, easydesigns, medium, University of Tennessee Chattanooga, O'Reilly, Covenant, C*, springboard, eph Fiber Optics, ChatMac, Chattanooga State Community College, SEWANEE, THE UNIVERSITY OF THE SOUTH, CHADNUG .net, and We Rock Tour. On the right side of the page is a sidebar titled "#DEVCHATT" containing several tweets from the @devchatt account. A red bracket on the right side of the sidebar points downwards, spanning the height of the sidebar area.

REGISTER

Name

Presentation Title

Email Address

Presentation Description

Twitter Address http://twitter.com/

Website

[Submit]

SPONSORS

chattanooga technology council easydesigns medium

UNIVERSITY OF TENNESSEE CHATTANOOGA O'REILLY

covenant C* springboard

eph Fiber Optics CM ChatMac

Chattanooga State Community College SEWANEE THE UNIVERSITY OF THE SOUTH

h. Chattanooga State Community College

<%CHADNUG%> .net

We Rock Tour

New Riders

#DEVCHATT

RT @devchatt: See, #DevChatt is now using Django. Come see Django co-creator @jacobian at #devchatt <http://devchatt.org>

May 23, 2010 at 12:10pm #devchatt

See, #DevChatt is now using Django. Come see Django co-creator @jacobian at #devchatt <http://devchatt.org>

May 23, 2010 at 12:10pm #devchatt

Be sure and come out for #DevChatt. #jacobian will talk about the future of web innovation. <http://devchatt.org/schedule/>

May 23, 2010 at 12:10pm #devchattrocks

Excited to announce that @mehmetkutlu will present on "Build Your Own Map Stack" at #DevChatt <http://devchatt.org> (via @devchatt)

May 23, 2010 at 12:10pm #devchattrocks

Excited to announce that @mehmetkutlu will present on "Build Your Own Map Stack" at #DevChatt <http://devchatt.org>

May 23, 2010 at 12:10pm #devchatt

#ORA most popular topics: #ora, #adv, #nosql, #devchatt, #chattanooga, #postgreSQL, #devchattrocks

May 23, 2010 at 12:10pm #chattanooga

Allright RT @devchatt Excited to announce that @eribugjohnson will present on "Two 'illities" for 2010 - Mobility

May 23, 2010 at 12:10pm #chattanooga

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role="complementary"

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⇒ role="contentinfo"

Structural Roles

The screenshot displays two sections of the DevChatt website:

- REGISTER:** A form with fields for Name, Email Address, Twitter Address (with value <http://twitter.com/>), and Website. It includes a "Presentation Title" and "Presentation Description" area, a map, and a "VIEW THE CONFERENCE SCHEDULE AND MAP" button.
- SPONSORS:** A list of sponsors with their logos, including Chattanooga Technology Council, easy designs, medium, University of Tennessee Chattanooga, O'Reilly, Covenant, C*, springboard, eph Fiber Optics, CM ChattMac, CHA php, Chattanooga State Community College, SEWANEE, THE UNIVERSITY OF THE SOUTH, <%CHADNUG%>.net, and We Rock Tour. The Chattanooga Technology Council logo is highlighted with a red box.

On the right side of the page, there is a sidebar titled "#DEVCHATT" containing several tweets from the DevChatt account. A red arrow points from the word "list" in the caption below to the sidebar area.

role="list"

Structural Roles

The screenshot shows two main sections of the DevChatt website:

- REGISTER**: A form with fields for Name, Email Address, Twitter Address (with value <http://twitter.com/>), and Website. It includes a "Presentation Title" and "Presentation Description" area, a map with pins, and a "VIEW THE CONFERENCE SCHEDULE AND MAP" button.
- SPONSORS**: A grid of logos for various sponsors including Chattanooga Technology Council, easydesigns, medium, University of Tennessee Chattanooga, O'Reilly, Covenant, C*, springboard, eph Fiber Optics, ChatMac, CHA PHP, Chattanooga State Community College, SEWANEE, THE UNIVERSITY OF THE SOUTH, <%CHADNUG%>.net, and We Rock Tour.
- #DEVCHATT**: A sidebar with a list of tweets from the #devchatt hashtag. One tweet is highlighted with a red box and the text "role='listitem'".

Role="listitem" is highlighted in red over the fourth tweet in the sidebar.

#DEVCHATT: RT @davidkatz: See, #DevChatt is now using Django. Come see Django co-creator @jacobian at #devchatt <http://devchatt.org>
May 23, 2010 at 12:10pm #devchatt

See, #DevChatt is now using Django. Come see Django co-creator Jacobian at #devchatt <http://devchatt.org>
May 23, 2010 at 12:10pm #devchatt

Be sure and come out for #DevChatt. @jenkovszics talk about the future of web education. <http://devchatt.org/schedule/>
May 23, 2010 at 12:10pm #webdevrocks

Excited to announce that EbenKaufine will present on "Build Your Own Map Stack" at #DevChatt <http://devchatt.org> (via @davidkatz)
May 23, 2010 at 12:10pm #mapstack

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May 23, 2010 at 12:10pm #mapstack

#ORA most popular topics: #qa, #adv, #process, #devchatt, #chattanooga, #processmapping, #devchattworks
May 23, 2010 at 12:10pm #chattanooga

Allright RT @davidkatz Excited to announce that EricJohnson will present on "Two 'illities" for 2010 - Mobility
May 23, 2010 at 12:10pm #chattanooga

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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

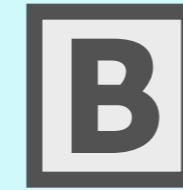
Indicate what's going on



Widget States



(off)



(on)

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

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

Widget States



(off)



(on)

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

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

Widget States



(off)



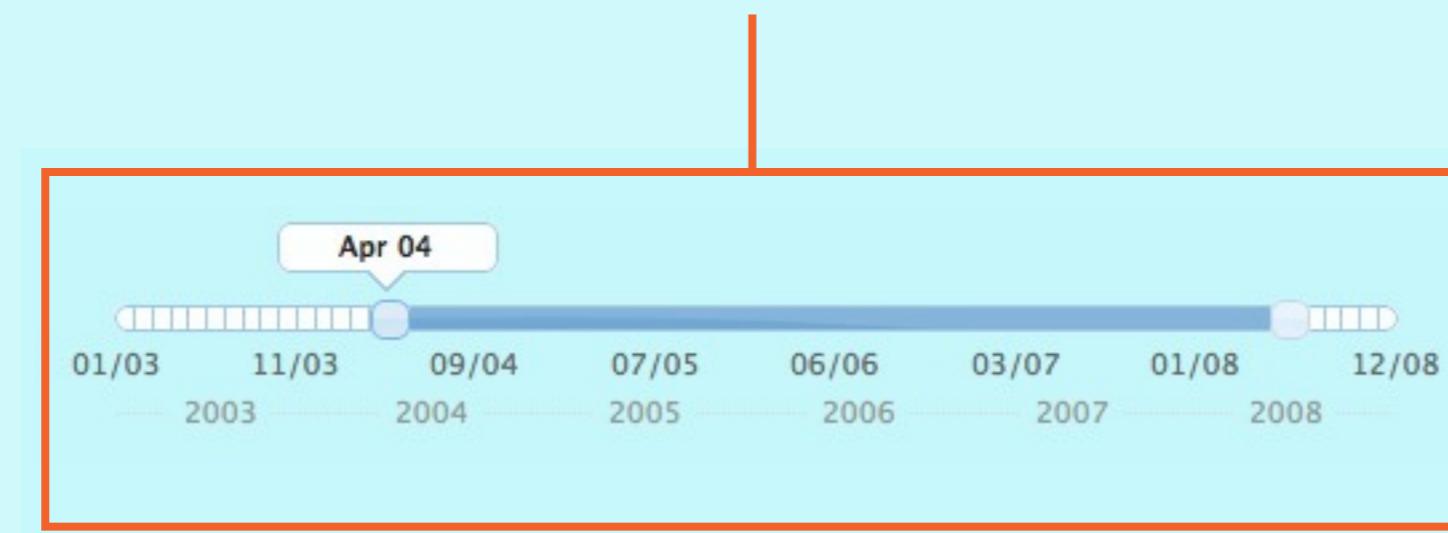
(on)

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

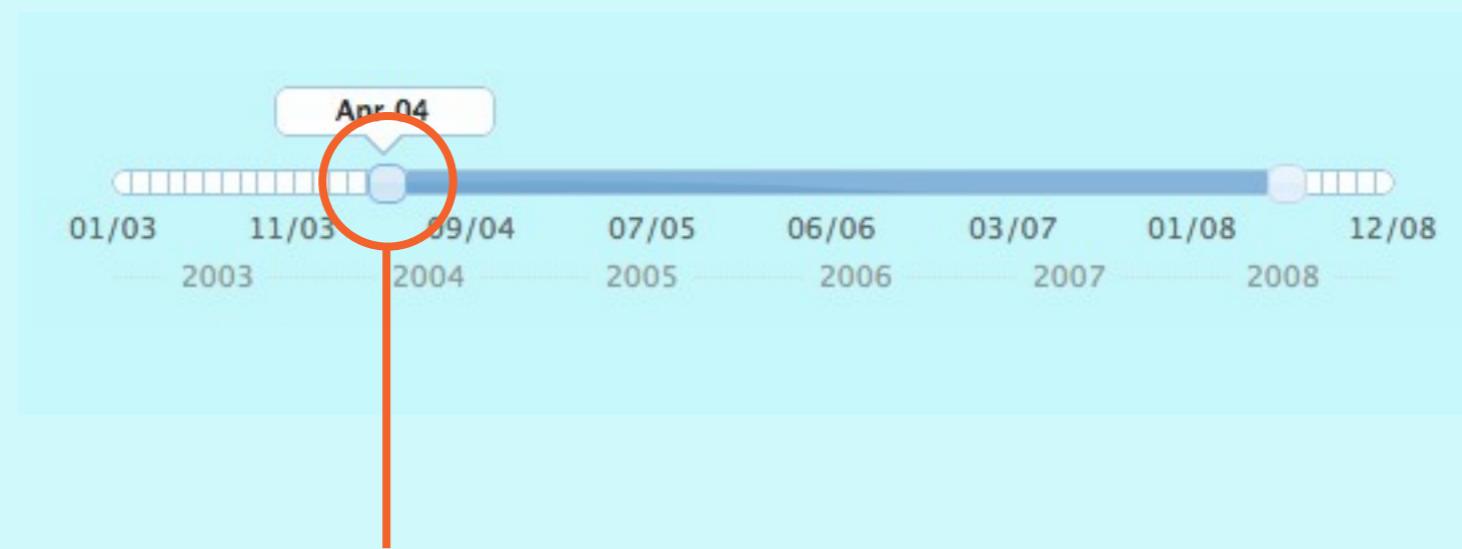
```
<button role="button" aria-pressed="true">  
    
</button>
```

Complex Widgets

role="application"

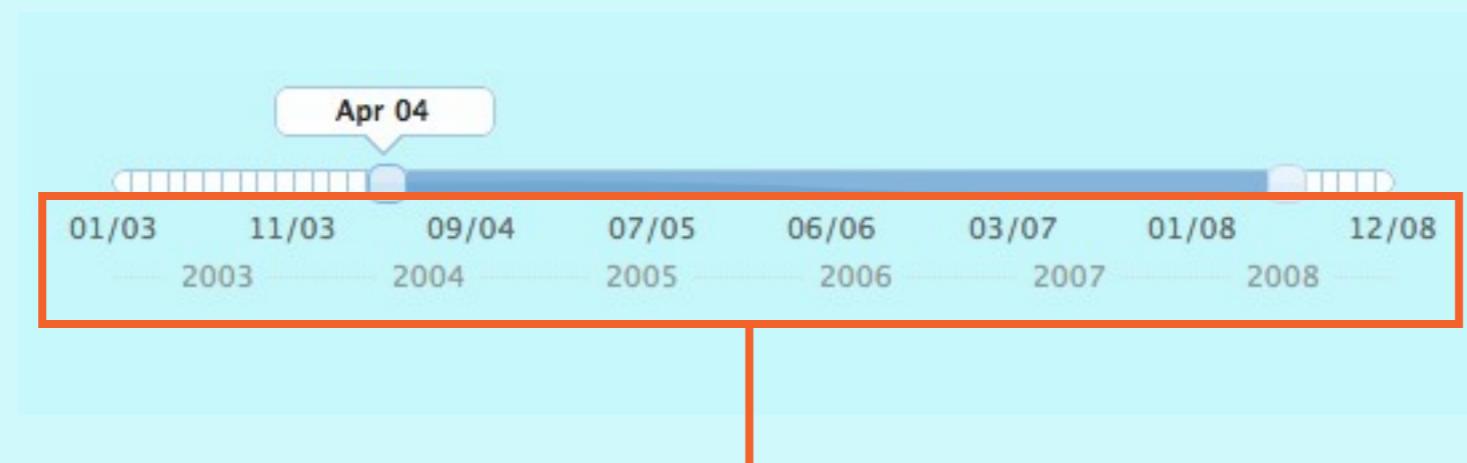


Complex Widgets



```
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`

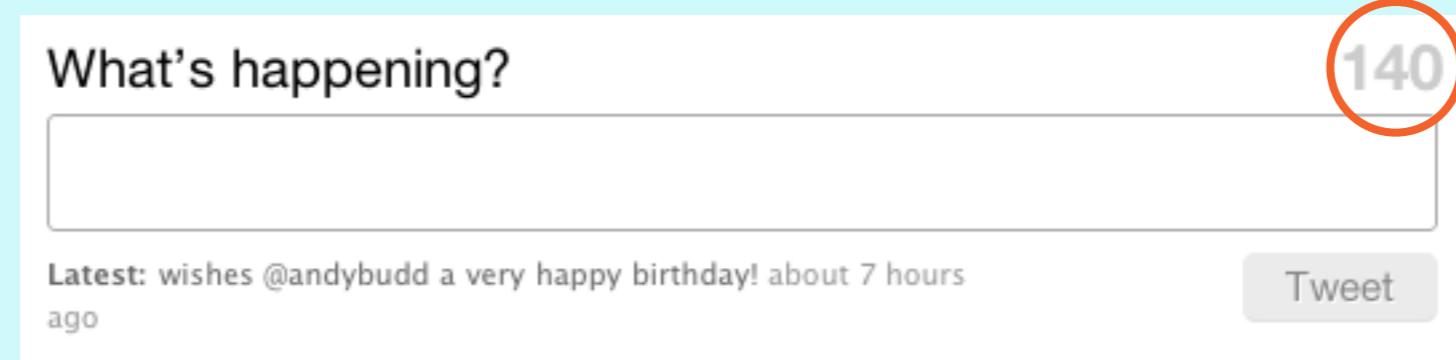
`aria-valuenow` (the W3C defines this as a “property”)

`aria-valuetext` (ditto)



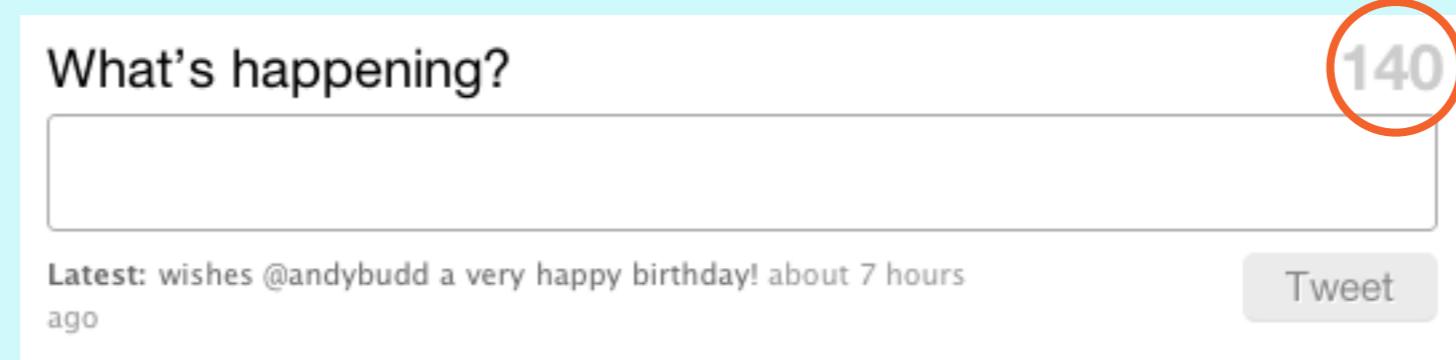
Highlight “living” content

Live Regions



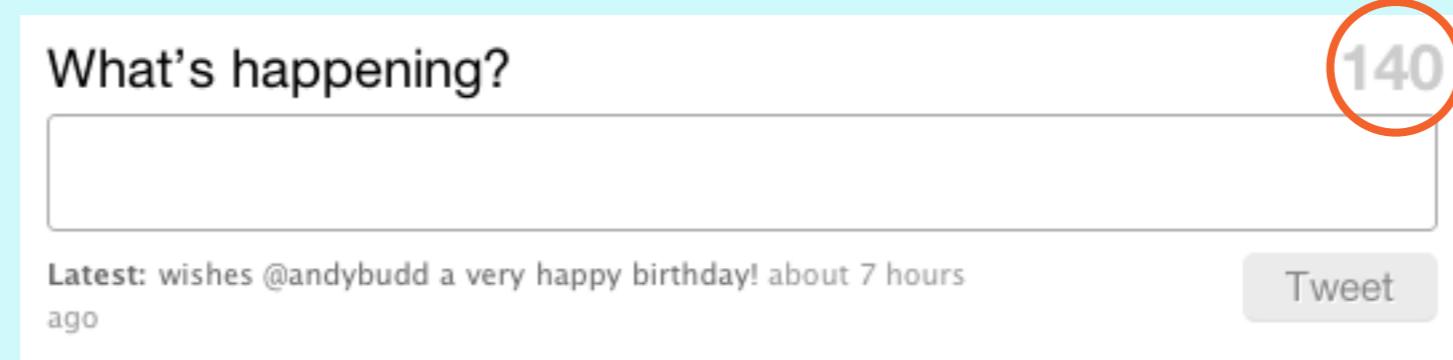
```
<span id="chars_left_notice" class="numeric">
  <strong id="status-field-char-counter"
    class="char-counter">140</strong>
</span>
```

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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Original recipe yield

1 x 9-inch deep dish pie

Prep Time

10min

Cook Time

1hr

Ready In

1hr 10min

Ingredients

A little typography

Pumpkin Pie

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Ready In: 1hr 10min



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

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 x 9-inch deep dish pie

Prep Time: 10min

Cook Time: 1hr

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Taking another look

Pumpkin Pie

Overview



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 x 9-inch deep dish pie

Prep Time

10min

Cook Time

1hr

Ready In

1hr 10min

Ingredients

Taking another look

Pumpkin Pie

Overview



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Original recipe yield

1 x 9-inch deep dish pie

Prep Time

10min

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1hr

Ready In

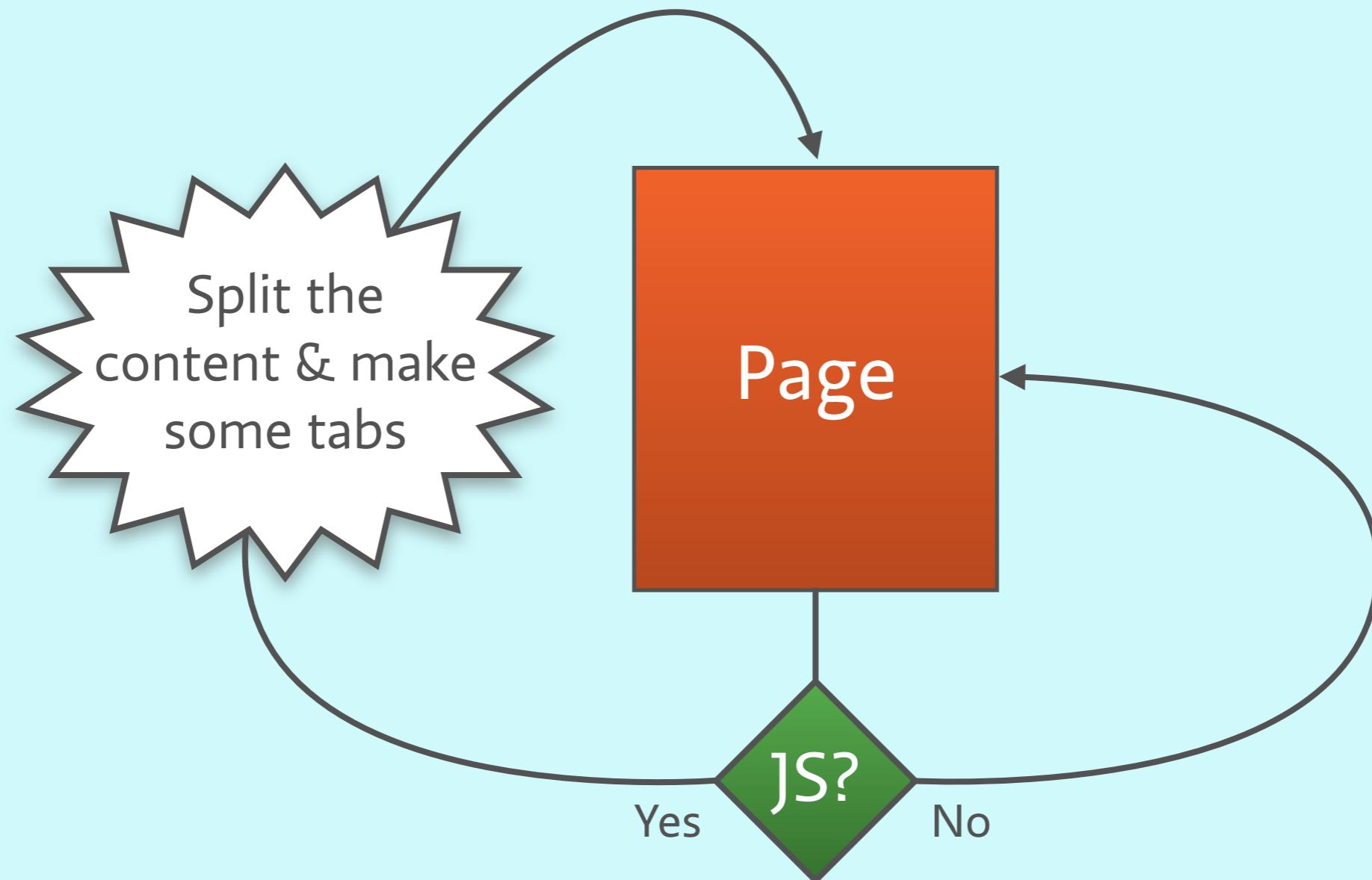
1hr 10min

Ingredients

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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Assigning ARIA Roles

Pumpkin Pie

OVERVIEW INGREDIENTS DIRECTIONS NUTRITION

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

Assigning ARIA Roles

Pumpkin Pie

OVERVIEW INGREDIENTS DIRECTIONS NUTRITION

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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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Ready In: 1hr 10min



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

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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

tabindex="0"

Pumpkin Pie

OVERVIEW

INGREDIENTS

DIRECTIONS

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Enabling the keyboard

tabindex="-1"

Pumpkin Pie

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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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Prep Time: 10min

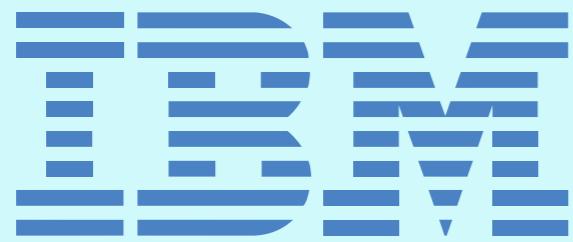
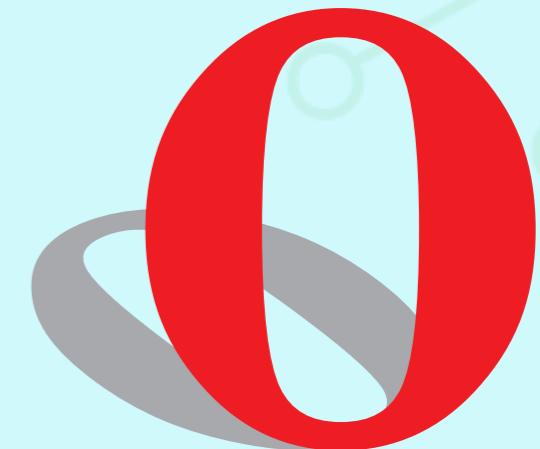
Cook Time: 1hr

Ready In: 1hr 10min



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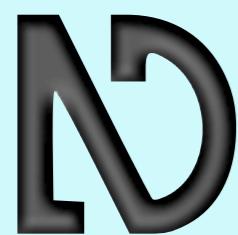
Who is Supporting WAI-ARIA?



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/

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

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