What is a Mobile Browser?

- Browser designed for a not-desktop display
  - Phones/PDAs, tablets, anything handheld
- Challenges and constraints
  - Small screen size
  - (Possibly) less feature support
    - CSS and JavaScript in (much) older browsers
    - Flash in iOS
  - Reduced *bandwidth*
    - Rate at which data is transferred
Early Mobile Web

- First mobile browsers appeared in mid-90s
  - Subject to constraints and inconsistencies

- Browser sniffing
  - Determine which browser being used
  - Provide customized site
    - Different styling, perhaps reduced content
  - Not an ideal solution
    - Too many browsers to target
    - Different versions to maintain

More Recent Mobile Web

- Mobile browsers have improved
  - Increased use of smartphones has helped

- Responsive design
  - Coined by Ethan Marcotte in 2010
  - Roughly, adapt to screen width via CSS
  - Generally affects desktop design
    - Plan how to "shrink" the site
@media Queries

- **CSS2**
  - Define media-specific rules
    - screen, print, etc.

- **CSS3**
  - Define media- and feature-specific rules
    - width, orientation, etc.
    - Connect with booleans and &
    - Several features permit min- and max- prefixes

The comma is equivalent to OR

- **width and device-width**
  - Former is width of the window
  - Latter is width of the device
  - Values can differ greatly
  - Best to stick with width

@media screen and (max-width: width) {
  ...
}

} Additional rules go here
Common Screen (Device-)Widths

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Smartphone Portrait</td>
<td>320px, 480px, ...</td>
</tr>
<tr>
<td>Smartphone Landscape</td>
<td>480px, 600px, 640px ...</td>
</tr>
<tr>
<td>Tablet Portrait</td>
<td>640px, 768px, 800px, ...</td>
</tr>
<tr>
<td>Tablet Landscape</td>
<td>768px, 800px, 960px, ...</td>
</tr>
<tr>
<td>Larger Screens</td>
<td>1024px, 1224px, 1280px, ...</td>
</tr>
</tbody>
</table>

Fixed vs. Fluid Layout

- **Fixed-width**
  - Define overall width of the content in px
  - Only displays defined width(s)
    - All adaptations to window size must be defined
  - Allows greater control

- **Fluid-width**
  - Define overall width of the content in %
  - Shrinks/expands to all window sizes
  - More flexible for different sizes/resolutions
IE Conditional Comments

```html
<!-[if lt IE 8]>
   <link rel="stylesheet" href="./css/ielt8.css"/>
<![endif]-->
```

- Interpreted by IE9 and earlier
- Helps to support older versions of IE
  - Load specific CSS to manage idiosyncrasies

Rendering Engines

- Every browser has its own rendering engine
  - Styles and displays the content

<table>
<thead>
<tr>
<th>IE</th>
<th>Trident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firefox</td>
<td>Gecko</td>
</tr>
<tr>
<td>Safari &amp; Chrome (up to 27)</td>
<td>WebKit</td>
</tr>
<tr>
<td>Chrome (28 &amp; up)</td>
<td>Blink</td>
</tr>
</tbody>
</table>
Vendor Prefixes

- Precede some CSS properties
  - Designed for browser-specific experimental features
  - Now common in established features ...
    - ... but currently there's an effort to eliminate them

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<td>-ms-</td>
</tr>
<tr>
<td>Firefox</td>
<td>-moz-</td>
</tr>
<tr>
<td>Safari &amp; Chrome</td>
<td>-webkit-</td>
</tr>
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</table>

CSS3

- Can't cover all properties and values
  - Will examine a few popular ones
  - Also recommended: gradients, transitions

- opacity
  - Sets opacity/opacity of an element
  - Value: decimal in \([0, 1]\) for \([\text{transparent}, \text{opaque}]\)

- border-radius
  - Rounds an element's corners
  - Value: px or %
• box-shadow and text-shadow
  • Add shading to elements or text, respectively
  • color is a formatted color value
  • inset creates an inner shadow
  • All other values are in px

box-shadow: h-shadow v-shadow blur spread color inset
  Required

text-shadow: h-shadow v-shadow blur color

---

**Fallbacks**

• Define alternatives to manage browser inconsistencies
  • Can be in HTML, CSS, JavaScript

• CSS fallback tips
  • Put fallbacks in the same rule
  • Watch the order and the property

font-family: Verdana, Arial, sans-serif;
background-color: #222;
background-color: rgba(0, 0, 0, 0.75);