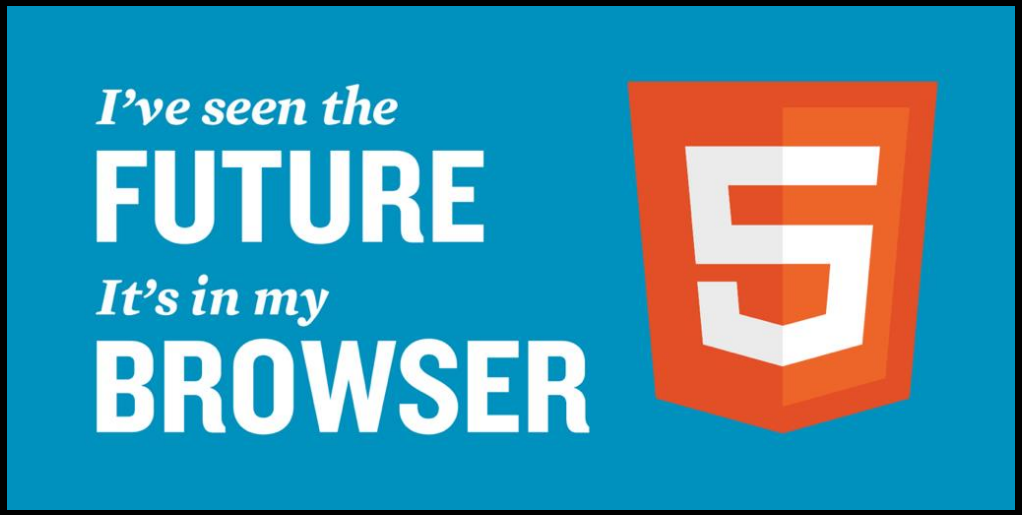


The Mobile Web

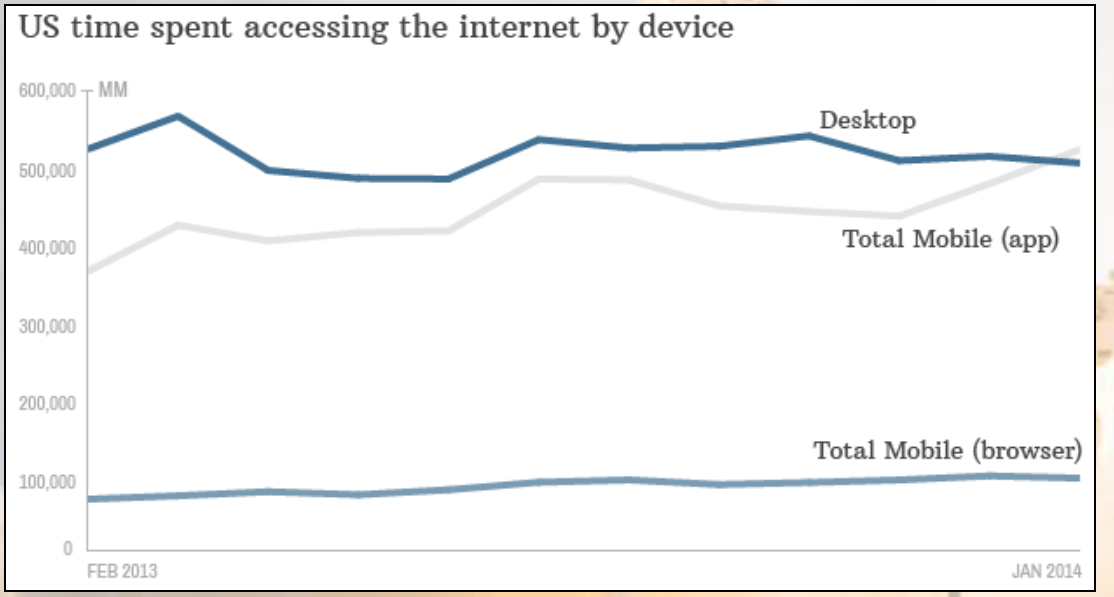
Mark Branom
Continuing Studies CS 22

Topics

- Concerns, concepts, and strategies
  - Why mobile matters
  - Responsive Design
  - Mobile First!
  - Mobile app vs. Native app

Why Mobile Matters

- Mobile access > non-mobile

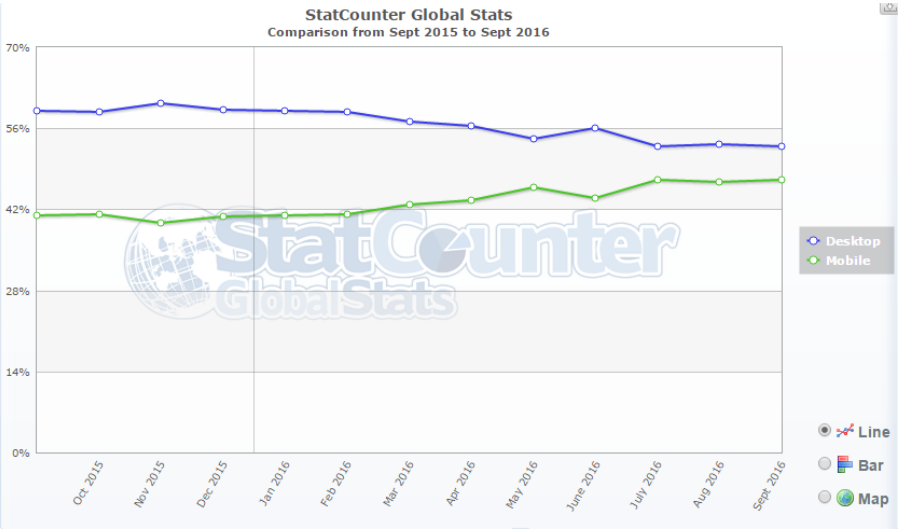


	U.S.	U.K.	Italy
Monthly TV time spent	185 hours	129 hours, 54 minutes	143 hours, 20 minutes
Monthly online time spent	26 hours, 58 minutes	29 hours, 14 minutes	18 hours, 7 minutes
Monthly mobile time spent	34 hours, 21 minutes	41 hours, 42 minutes	37 hours, 12 minutes

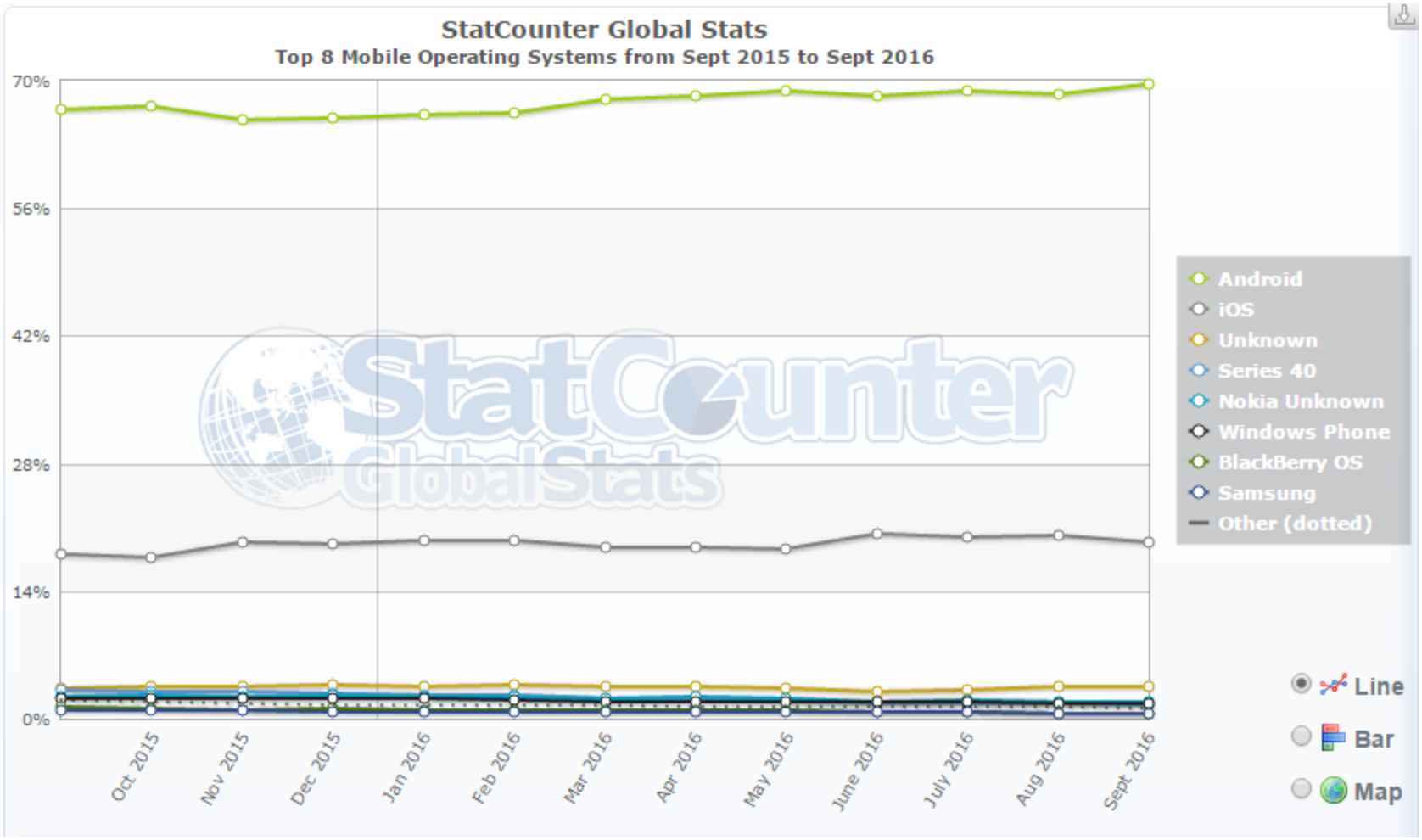
Source: Nielsen

Why Mobile Matters

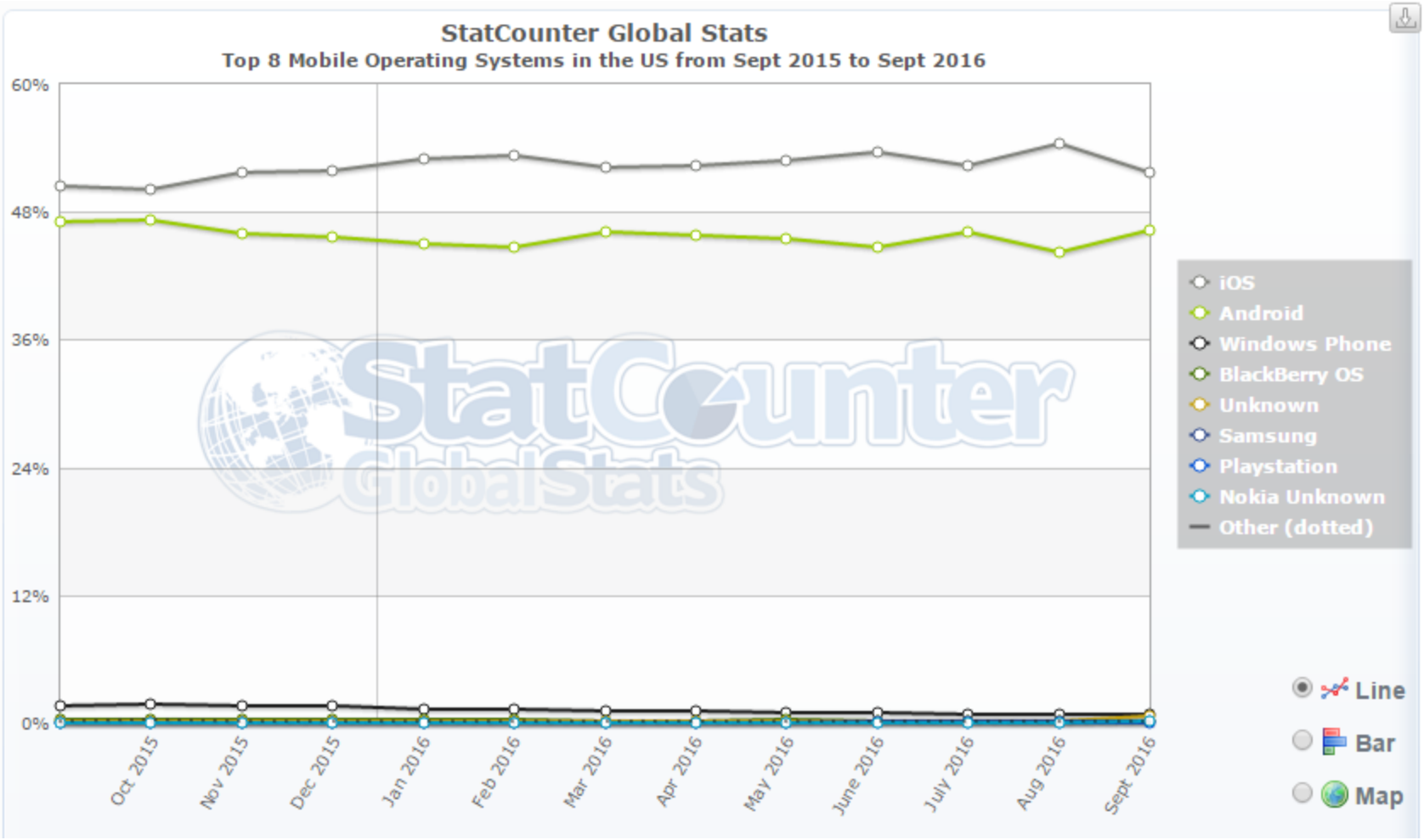
- Nearly 50% of web traffic viewed on mobile devices
- 59% of people have viewed website on phone, then followed up on desktop
- 34% have done the reverse



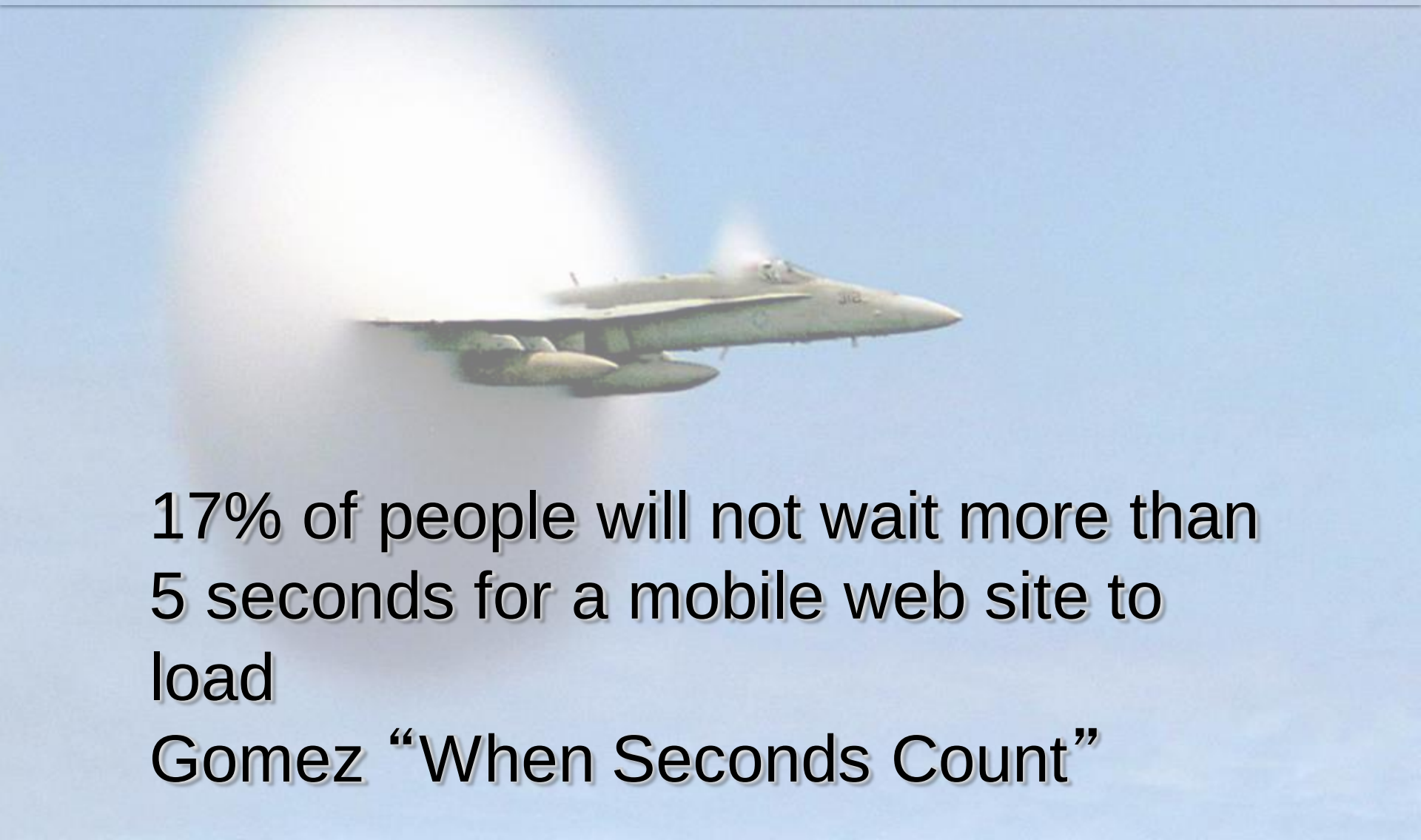
Worldwide Mobile Operating Systems



US Mobile Operating Systems



Speed Matters



17% of people will not wait more than 5 seconds for a mobile web site to load

Gomez “When Seconds Count”

Speed Matters

Google breaks down
mobile users
into
3 behavior groups

Repetitive now
Bored now
Urgent now

Where is mobile used?

- 82% of mobile web use at home
- Waiting in line
- Most tablet use 6pm - 10pm

Mobile Browser Environment

- Good Browsers
  - iOS, Android, Opera Mobile, new Blackberry
  - Support most of HTML5, CSS3, JS

Not So Good Browsers

Feature phones and everything else

No support for HTML5, CSS3 or JS

@ppk's mobile browser feature compatibility list

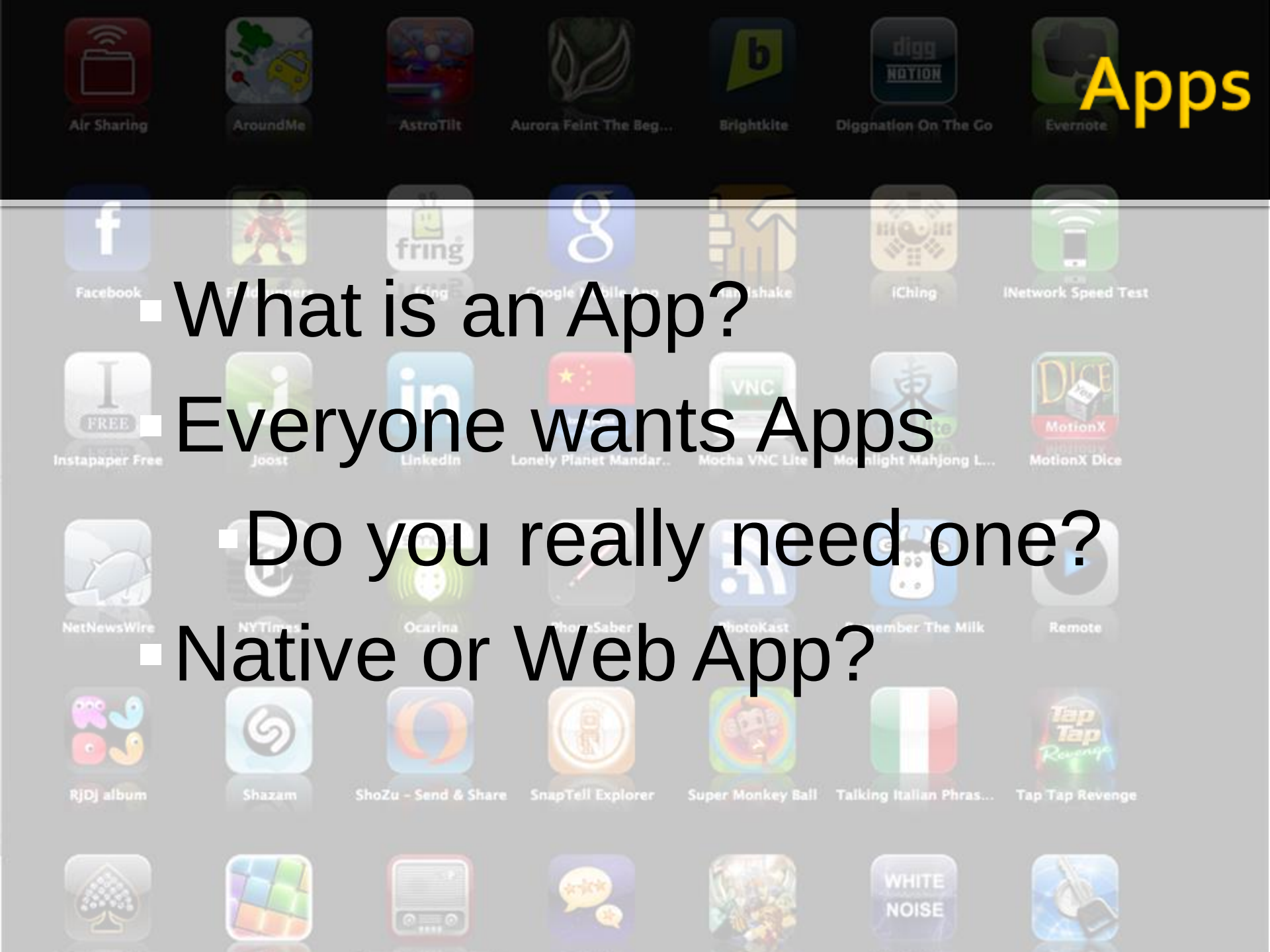
http://www.quirksmode.org/mobile/

Mobile is Personal

- Anywhere, anytime access
- Access to user
  location, camera, address book, phone functionality, etc.
- Touch and gesture control
- Even babies can play games on the iPad

Apps

- What is an App?
- Everyone wants Apps
  - Do you really need one?
- Native or Web App?



Native App

- Coded in multiple languages, tools:
  - Objective C, Xcode, and Swift (iOS)
  - Eclipse and Java or C++ (Android)
  - .Net Studio and C# (Windows Phone 7)
- Code cannot be reused across platforms :(
- In app stores, with 300,000 other apps

Web App

- Coded in HTML5, CSS 3, and Javascript
- Do it once and available everywhere
- Can be installed on phone
- Can be cached locally
  - even work offline
- Access to local storage

Hybrid Solutions

- Wrap your web app in a native app
- Device access (camera, contacts, etc)
- Available in app stores
- Open source
  - PhoneGap – http://phonegap.com
- Commercial
  - Appcelerator Titanium - http://www.appcelerator.com/

Still need a web site

- Visitors and other non local users
- Search
  - Returns links
  - Google does not distinguish between desktop or mobile sites
- Feature phones
- Phones you don't build for

Mobile Web!

I've seen the
FUTURE
It's in my
BROWSER

Separate Mobile Site

- Used to be the way to do it
  - When devices had very limited browsers
- More maintenance
- What about new devices?
  - Device detection scramble
- Usually means a redirect [BAD]

Progressive Enhancement

- Deliver a simple site
- Enhance it based on the capabilities of the browser
  - Media Queries
  - Feature detection (Modernizr)
  - JavaScript
  - CSS3 features

Responsive Design

- Website should display content reasonably regardless of device resolution / orientation
  - fluid grids, CSS 3 layouts
  - content priority is maintained
  - content adjusted to the viewable space
  - text scaled to maintain content readability
- Ethan Marcotte's article
  http://www.alistapart.com/articles/responsive-web-design/

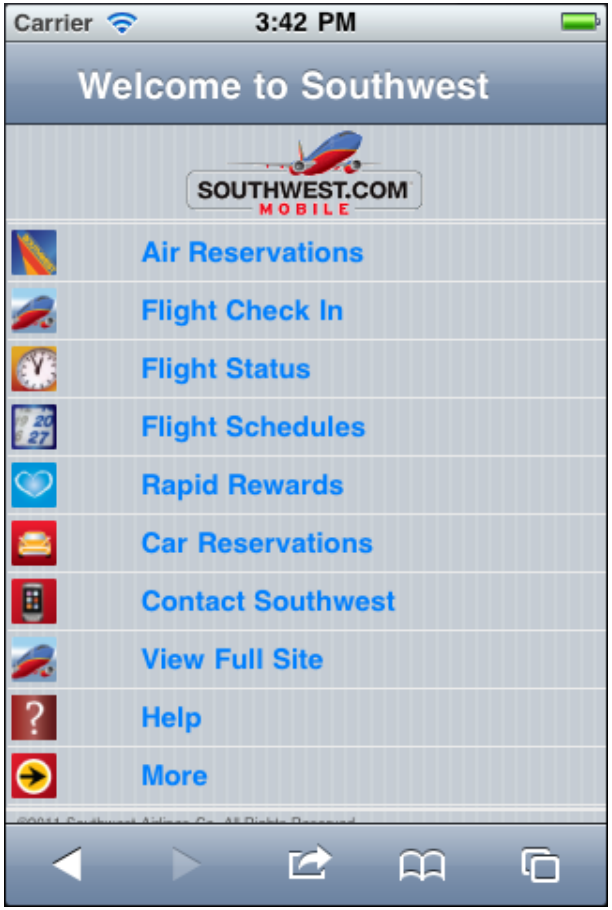
Ethan was mostly right

- He was wrong about images
  - Suggested using largest needed image
  - Letting the browser resize
  - Really bad for performance
- Jason Grigsby: resize images on server
  http://www.cloudfour.com/css-media-query-for-mobile-is-fools-gold/

Mobile First!

- Luke (@lukew) Wroblewski's Mobile First Talk
  - http://www.lukew.com/ff/entry.asp?1137
- Mobile constraints improve design
  - Limited screen real estate on mobile
  - One distracted eyeball, one fat finger
- Present only the most important content
- Better usability = Better experience!

Desktop vs Mobile

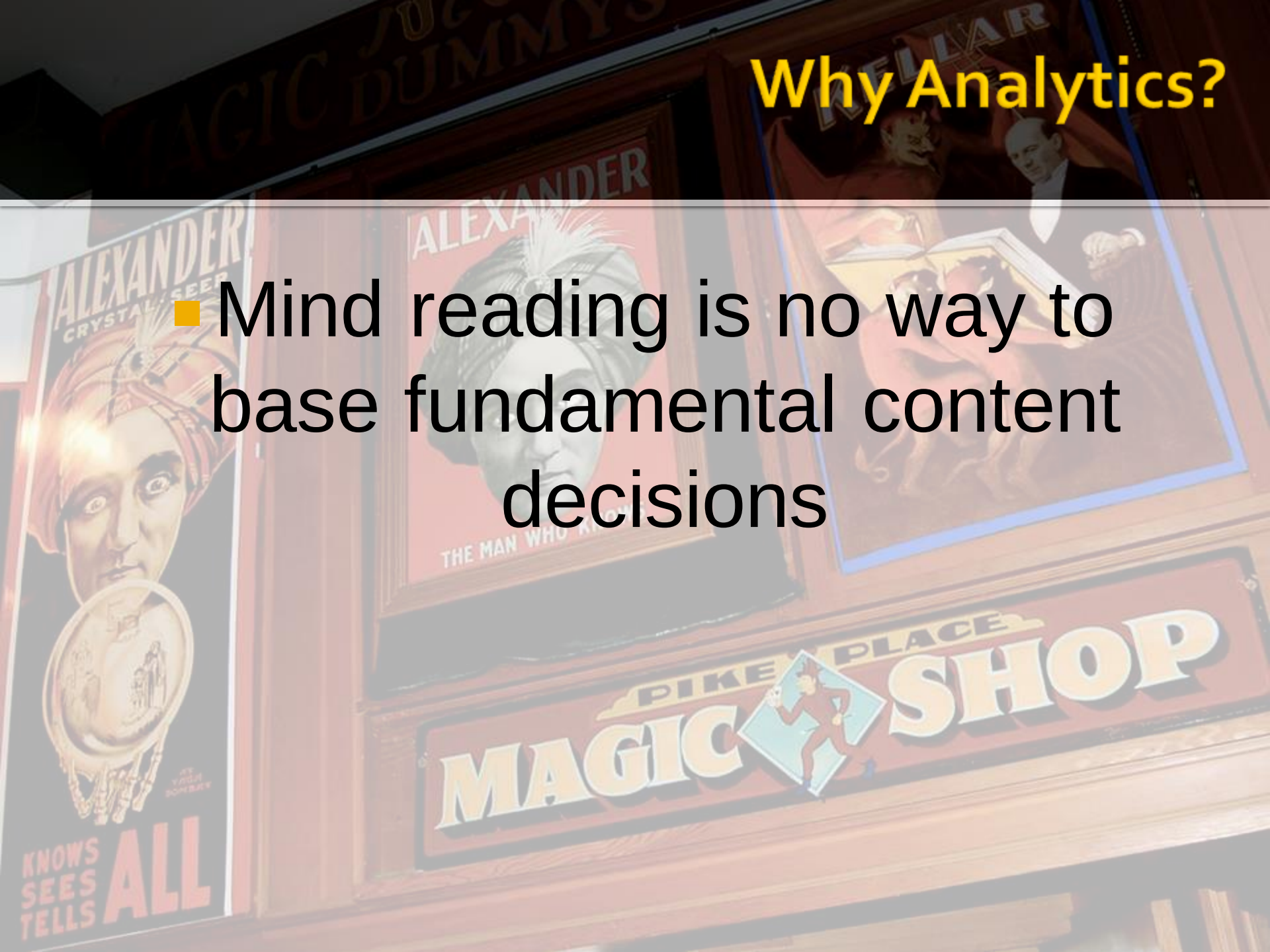


or is it Content First?

- Site Architecture
  - Many people ignore and forget this
- Using all your content might not be the answer
  - But mobile users often want it all
- What do mobile users need on your site?
- Use analytics

Why Analytics?

- Mind reading is no way to base fundamental content decisions



Accessibility

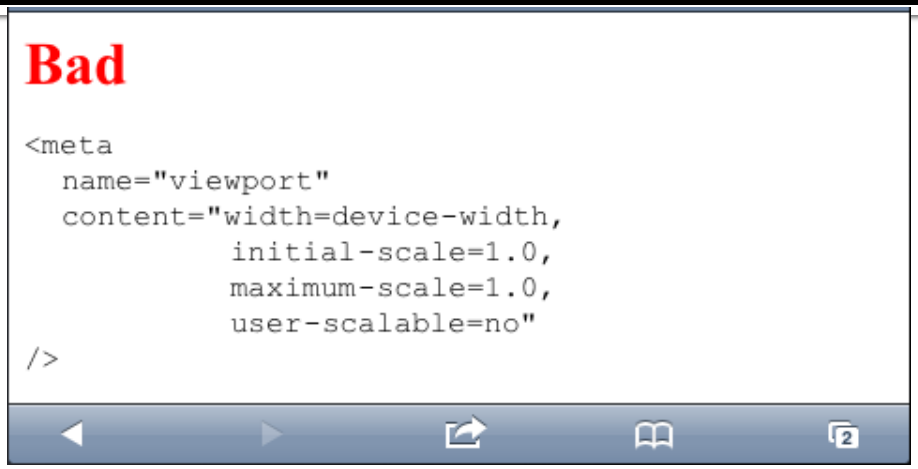
- If I can't use your awesome website...
  It's not really that awesome, is it?

- Make content accessible by everyone
- Content accessibility > Presentation styles

Viewports

- Mobile browsers default to 960px wide
  - but scaled down
- Fine for desktop sites, not for mobile sites
- Set the viewport...
  - carefully

Bad Viewports



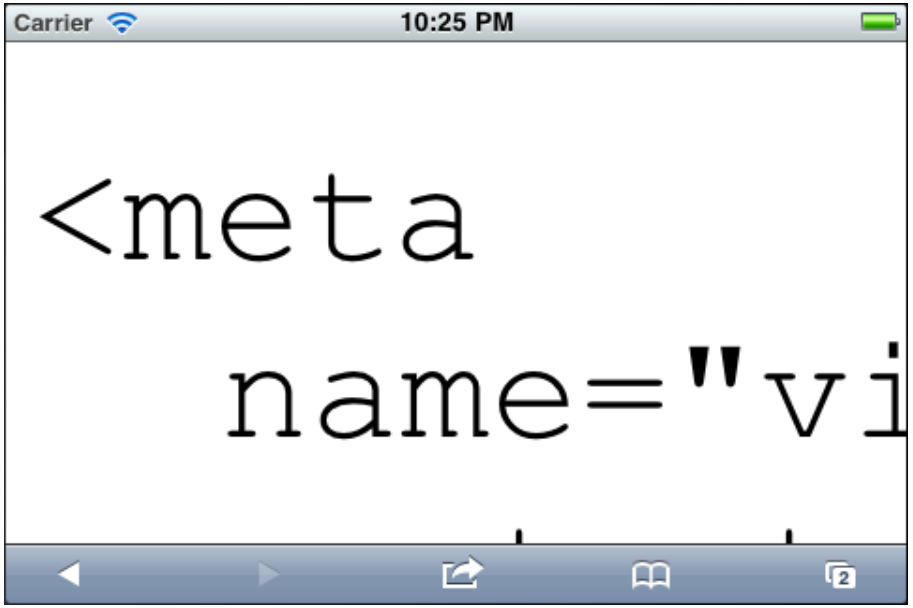
Pinch and Zoom to

Good Viewports

Good

```
<meta
  name="viewport"
  content="width=device-width,
           initial-scale=1.0,
           user-scalable=yes"
/>
```

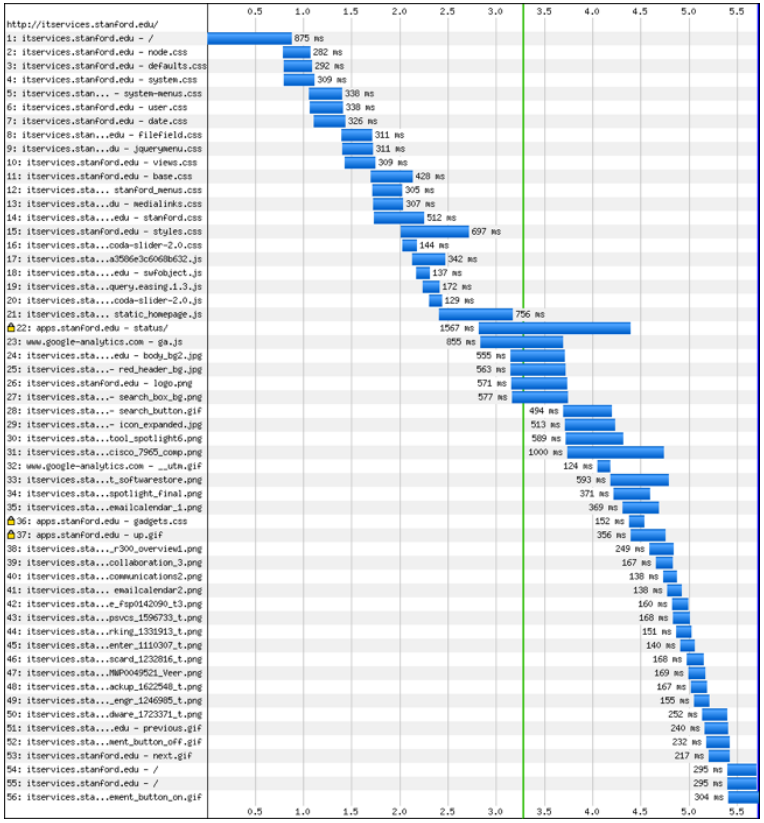
Pinch and Zoom to



Performance and Optimization

- Mobile devices often suffer from
  - Low bandwidth
  - High latency
  - Unreliable connectivity
  - Slower processors
- Browsers only use 2,4, or 6 connections to a site

How Pages are Fetched



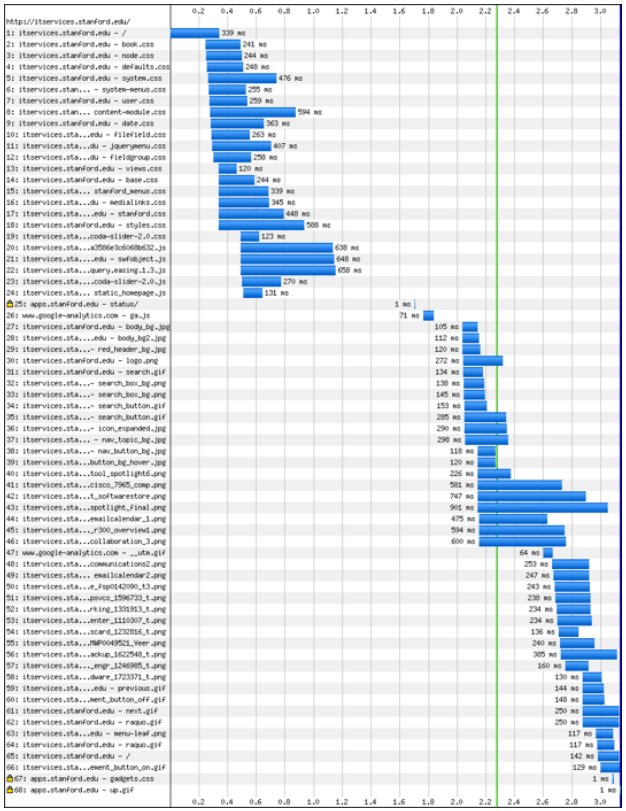
iOS uses up to 6 connections

http://www.spasche.net/files/parallel_connections

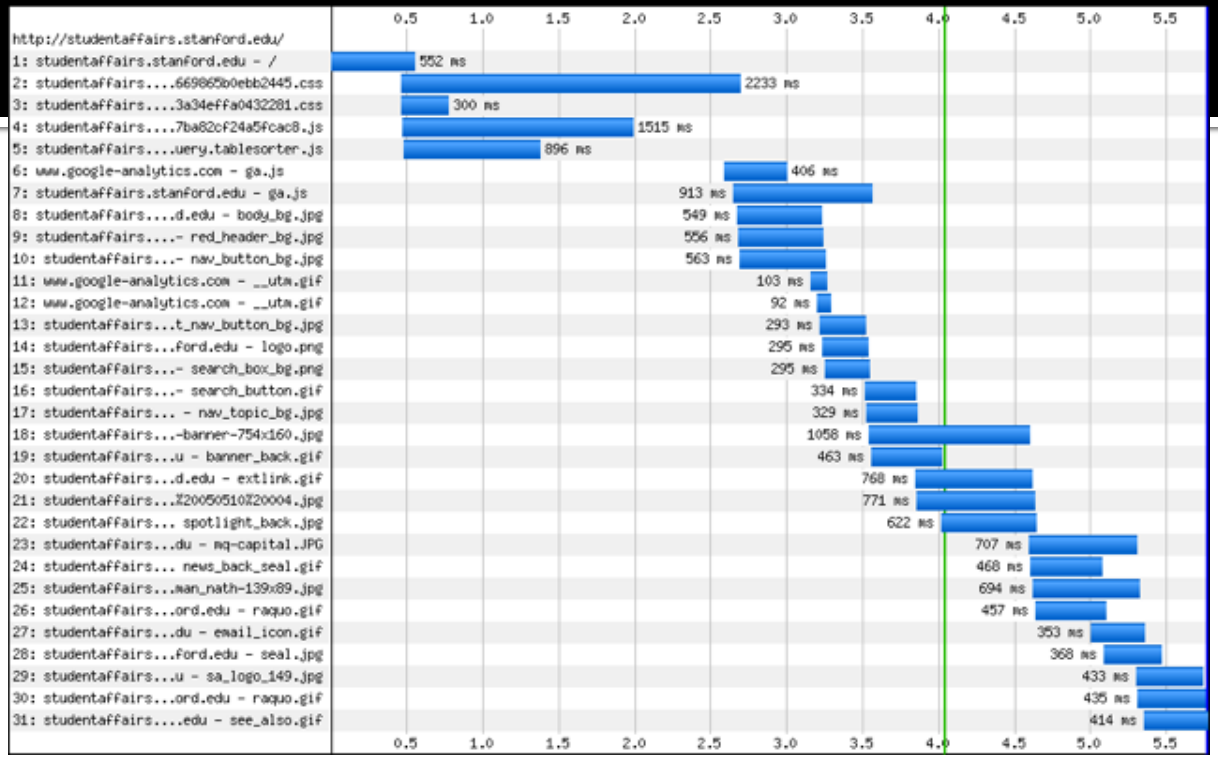
How Pages are Fetched

Android uses up to 11 connections!

http://www.spasche.net/files/parallel_connections



Performance Rules



Aggregate and minimize your CSS and Javascript

But look at all those images!

Images

- Resize images on the server
- For images used in CSS
  - Base64 encode images, embed in CSS
    http://www.websiteoptimization.com/speed/tweak/inline-images
  - Use CSS sprites
    http://www.alistapart.com/articles/sprites

Testing

- Emulators / simulators work, up to a point
  - May need Mac and Windows hosts
- Test with real devices
  - On real networks (3g, Starbucks wifi)
  - In real conditions
    - Outside in sunshine
    - In classrooms

Managing a Mobile Site

- Content Management and Maintenance
  - Use database or CMS to manage content
  - Reuse and publish content to multiple locations
- Web Analytics
  - Track usage and behavior
  - Justify the need for mobile optimized sites
- Continual Improvement

Some thoughts on a mobile framework…

- JQuery Mobile for mobile framework
  - UI elements
  - Base style
- Modernizr for feature detection http://www.modernizr.com/
- Media queries for screen size detection
- Simple backend device classification

Mobile Framework Showcase

- Examples of mobile aware web developed using a mobile framework
  - JQuery Mobile
    - http://www.jqmgallery.com/2011/06/10/stanford/
  - Sencha Touch
  - http://itservices.stanford.edu/service/web/mobile/developers/frameworks

Developing for Mobile – Mobile First

Well-Structured Content

Traditional Content Layout

```
<div id="container">
    <div id="header"></div>
    <div id="left-sidebar"></div>
    <div id="center-content"></div>
    <div id="right-sidebar"></div>
    <div id="footer"></div>
</div>
```

Mobile Optimized Content Layout

```
<div id="container">
  <header></header>
  <div id="maincontent"></div>   (soon: <main></main> )
  <aside></aside>
  <footer></footer>
</div>
```

Screen Resolutions

See http://viewportsizes.com/ for the latest in screen resolution sizes!

Viewport

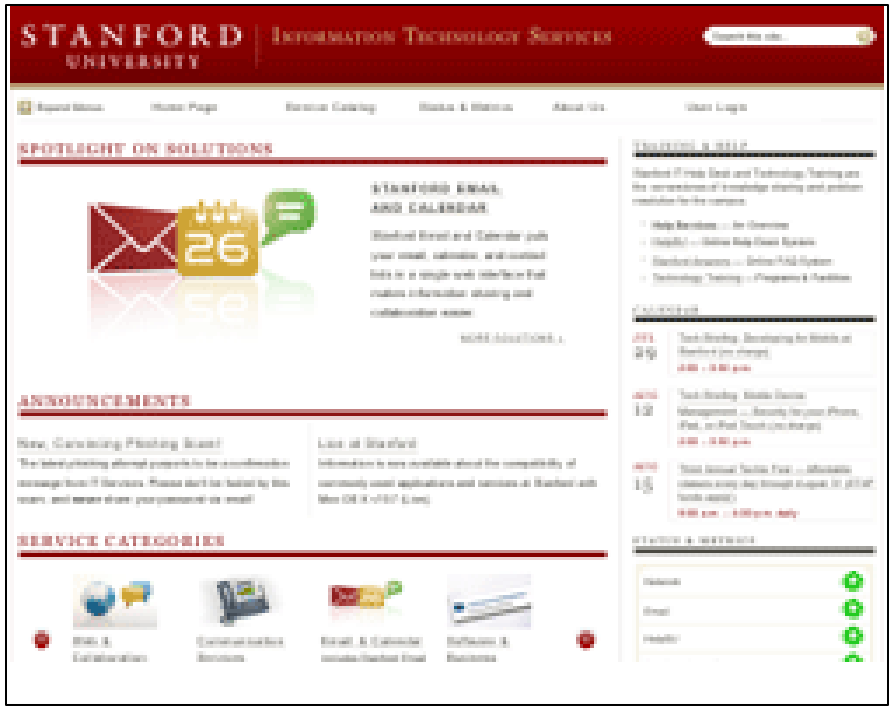
- The viewport is the area that determines how content is laid out and where text wraps on the webpage. The viewport can be larger or smaller than the visible area.
- Standard viewport setting

```
<meta name="viewport" content="width=device-width" />
```

- If you only want to load the viewport settings for devices with screen size less than 640 pixels, use this JavaScript:

```
<script type="text/javascript"> if
((window.screen.width < 640) ||
(window.screen.height < 640))
{document.write(' <meta name="viewport"
content="width=device-width" /> ')} </script>
```

Default viewport widths



Viewport not set to width="device-width"

Viewport set to width="device-width"

Media Queries

CSS Media Query allows the loading of particular style sheets based on media types like screen, print, handheld and media features like device width, height, orientation, aspect-ratio, color, resolution, etc.

Examples of loading different CSS based on media type.

```
<link type="text/css" rel="stylesheet" media="all" href="base.css" />

<link type="text/css" rel="stylesheet" media="screen" href="desktop.css" />

<link type="text/css" rel="stylesheet" media="only screen and (max-width: 640px)"
href="mobile.css" />

<link type="text/css" rel="stylesheet" media="only screen and (max-width: 640px)
and (orientation:landscape)" href="mobile_landscape.css" />

<link type="text/css" rel="stylesheet" media="print" href="print.css" />
```

The media="handheld" is not observed by most mobile browsers.

JavaScript

Javascript's user agent function can be used for browser detection. To display different style sheets for iPhones and iPods in portrait or landscape orientations, add this to your HTML file:

```
<script type="text/javascript">
if((navigator.userAgent.match(/iPhone/i)) || (navigator.userAgent.match(/iPod/i)))
{document.write('<link rel="stylesheet" type="text/css"
media="only screen and (max-width: 640px) and (orientation:landscape)"
href="css/mobile_landscape.css" />')}
</script>
```

Internet Explorer/Windows Phone

IE Mobile in Windows Phone 7 does not observe media queries properly.

Use this method to load the same mobile styles for IE Mobile.

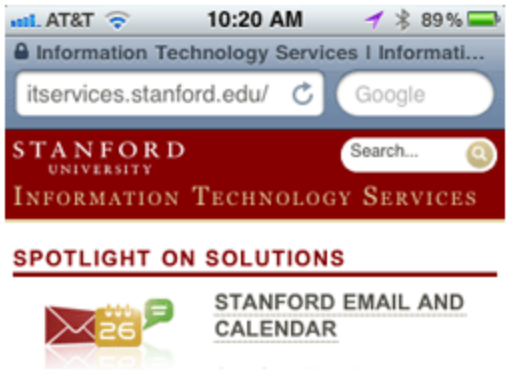
```
<!--[if IEMobile]>
<link rel="stylesheet" type="text/css" media="screen" href="mobile.css" />
<link rel="stylesheet" type="text/css" media="screen" href="wp7.css" />
<![endif]-->
```

Since IE Mobile has a poor CSS rendering engine, you can also use this method to load custom IE Mobile styles.

Hiding the Address Bar

```
addEventListener("load", function() { setTimeout(hideURLbar, 0); }, false);
        function hideURLbar(){
                if (window.pageYOffset < 1) {
        window.scrollTo(0, 1);
        }
}
```

`window.pageYOffset < 1` is used to check if the user has already started scrolling and not jump to the top of the page if so.



If you choose to have a separate mobile site…

- …use jquery mobile: http://jquerymobile.com

Stanford Homepage

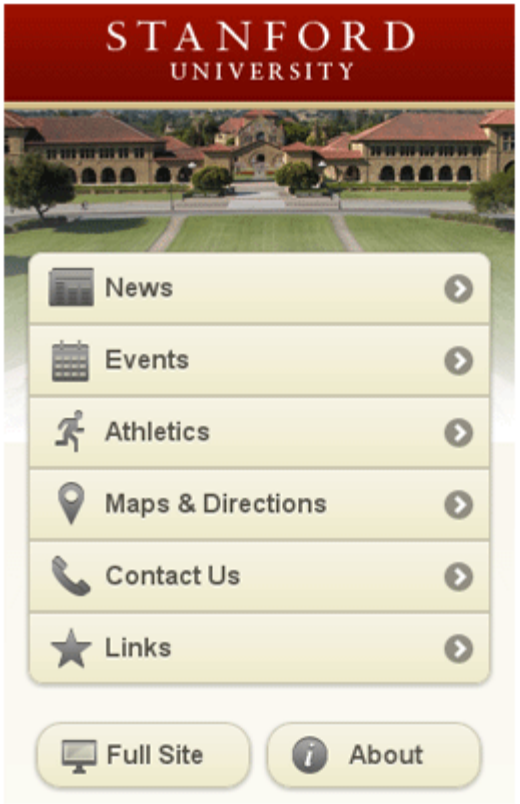
m.stanford.edu

Lane Library

lane.stanford.edu
(on iPhone or Android)

Why jquery mobile?

jQuery Mobile



Without Javascript and CSS

Stanford Mobile

- News
- Events
- Athletics
- Maps & Directions
- Contact Us
- Links

Full Site

About

Responsive design sites

- Boston Globe: http://bostonglobe.com/
- Stanford IT Services: http://itservices.stanford.edu/
- Smashing Magainze: http://smashingmagazine.com/

Twitter Bootstrap makes it easy!

- **What is Twitter Bootstrap?**

- A bunch of HTML, CSS, and Javascript files
- Responsive design interaction components
- Open-source
  - http://twitter.github.com/bootstrap/

Other Responsive Web Frameworks

- Zurb Foundation: http://foundation.zurb.com
- Skeleton: http://getskeleton.com
- Less Framework: http://lessframework.com
- Frameless Grid: http://framelessgrid.com
- Amazium: http://www.amazium.co.uk