



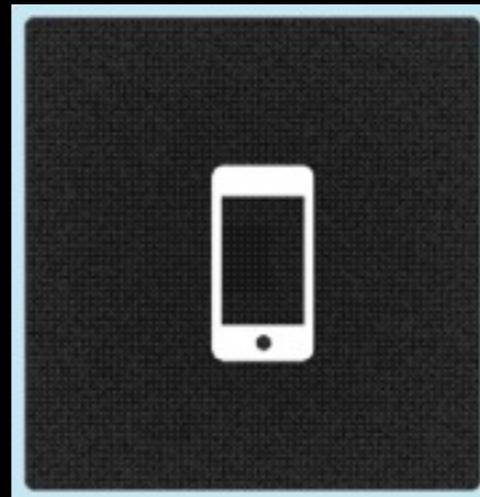
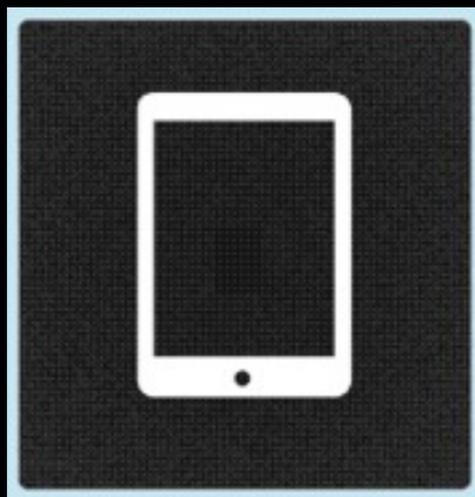
July 23 - 24, 2012 • New York City, NY

[www.devconfive.com](http://www.devconfive.com)

# DevCon 5

**HTML5  
& Mobile App  
Developers  
Conference**

# Expanding *Axis* across 3 screens with Mojito



# Caridy Patino

Principal Engineer at Yahoo! Search  
YUI Evangelist & Mojito Ambassador

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[@caridy](#)



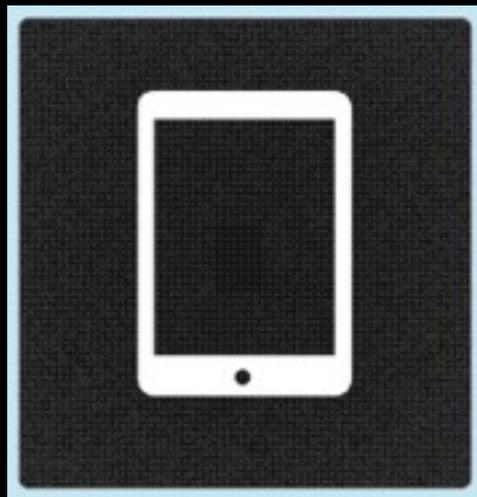
# Agenda:

- 12 Lessons from Axis
- Mojito for Mobile Apps

Axis demo video from  
[axis.yahoo.com](http://axis.yahoo.com)  
for better context!



# From day one:



iPhone/iPad/Desktop



# 12 Lessons



## Lesson #1

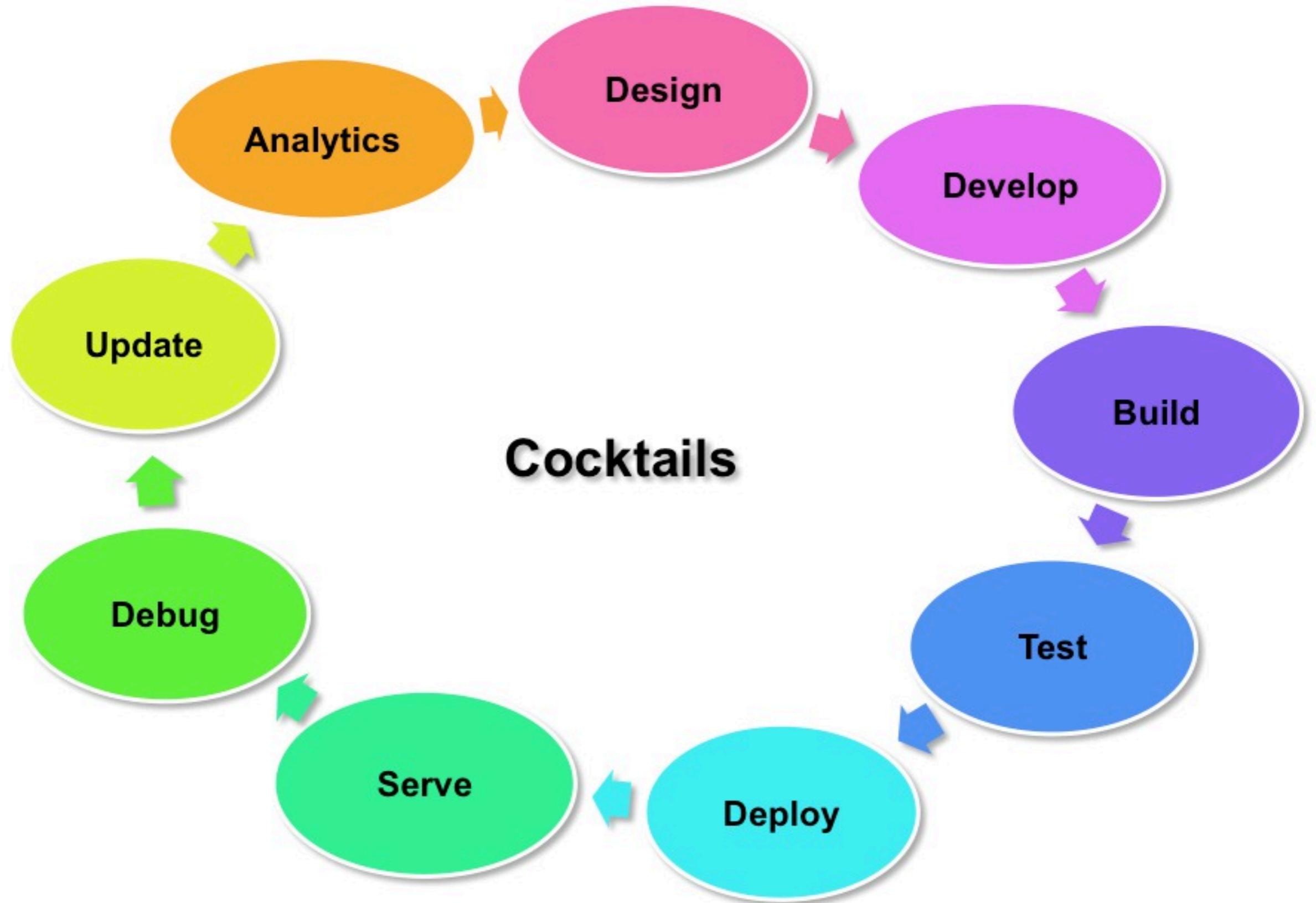
Build mobile products on top of  
platforms designed primarily for  
mobile products



# Yahoo! Cocktails

Yahoo! Cocktails is set to become the *de facto* infrastructure for mobile applications at Yahoo!

# Yahoo! Cocktails Umbrella





# Mojito JavaScript Application Framework

<http://github.com/yahoo/mojito>



# Manhattan

Hosting infrastructure for  
Node.js applications.



# Mojito Shaker

Shaker is a static asset rollup manager for Mojito applications.

<http://github.com/yahoo/mojito-shaker>

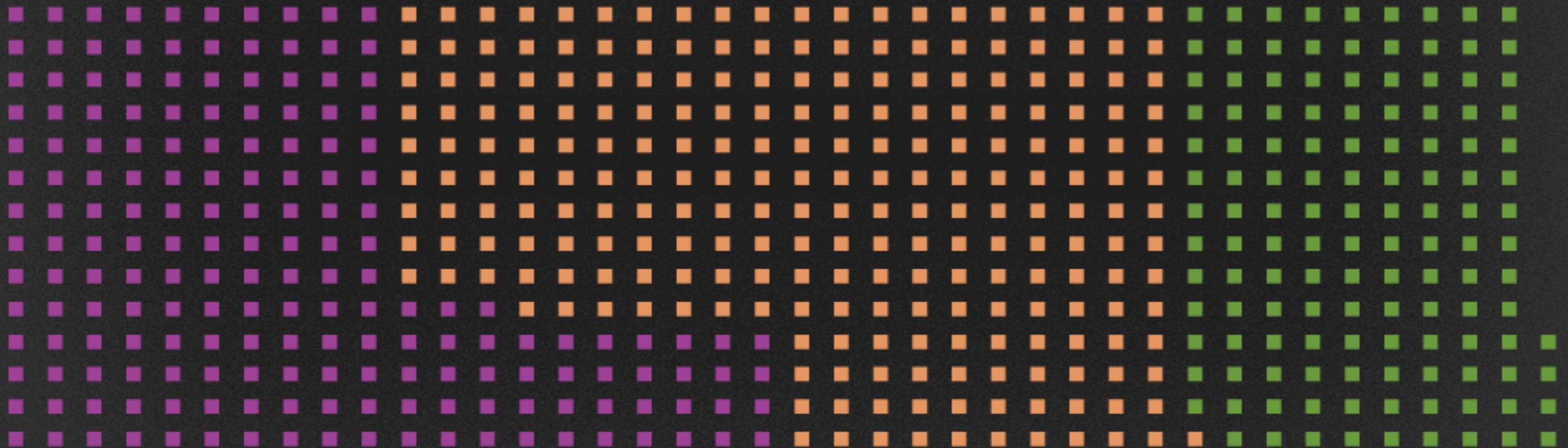
## Lesson #2

"write once, run everywhere",  
no so fast!

# Axis design specs per device

**547**  
MOCKS

*Every single one reviewed on the device it was designed for.*



■ DESKTOP

■ IPAD

■ IPHONE



Can you imagine a car that works *exceptionally* well under *any* condition?

*Cocktails* is a suite of technologies  
to create user experiences optimized  
for each connected device

## Lesson #3

"divide & conquer",  
yes, it works on mobile too

aegon classic



- SEARCH:
- Web
- Images

- aegon classic
- aegon classic tennis
- aegon classic birmingham
- aegon classic 2010
- aegon classic 2011
- aegon classic 2009
- aegon classic live scores

**AEGON Classic**  
Birmingham Perry Club, Birmingham 17th - 17th June 2012

Rain washes out Monday, shortens practice

**LTA - AEGON Classic**  
www.lta.org.uk/fans-major-events/A...

**WTA**

**AEGON Classic**

WTA | Tourna  
Info | BIRMI  
www.wtatennis.com

SEARCH WEB

Yahoo! Axis Home

READ LATER

Grid of 'READ LATER' items:

- Yahoo! TV: In No Time
- Yahoo! Screen: BOX OFFICE KNOCK OUT
- Yahoo! Screen: CRAZY STUPID POLITICS
- Yahoo! Screen: The Onion

MY FAVORITES

Grid of 'MY FAVORITES' items:

- Yahoo! Mail
- Yahoo! News
- Facebook

aegon classic

- SEARCH: aegon classic
- aegon classic tennis
- aegon classic birmingham
- aegon classic 2010
- aegon classic 2011
- aegon classic 2009
- aegon classic live scores

**AEGON Classic**  
Regent's Park Club, Birmingham 17th - 19th June 2012

News Tickets 2012 Ticket Information 2012 Hospitality Book now Download 2012 Schedule

**LTA - AEGON Classic**  
www.lta.org.uk/fans-major-events/A...

**WTA**

**AEGON Classic**

WTA | Tournament Info | BIRMINGHAM  
www.wtatennis.com

SEARCH WEB

Yahoo! Axis Home

READ LATER

Y! screen BETA

SCREEN HOME LIFESTYLE SPORTS

In No Time  
m/primetime

BOX OFFICE KNOCK OUT  
screen.yahoo.com/movies/bo...

CRAZY STUPID POLITICS  
BILL WAHNER LIVE FROM SILICON VALLEY  
screen.yahoo.com/crazystupi...

The Onion  
screen.ya

MY FAVORITES

YAHOO! MAIL

WHAT'S NEW INBOX CONTACTS

Compose Message

Inbox Conversations Drafts Sent

70° Now

mail.yahoo.com

YAHOO! NEWS

HOME U.S. WORLD BUSINESS ENTER

YOUR FRIENDS' ACTIVITY

news.yahoo.com

facebook

facebook helps you connect the people in your life.

facebook.com

# Sub-applications

The screenshot displays a search interface with a dark grey background. On the left, there is a search bar labeled 'SEARCH:' with a magnifying glass icon. Below it are two filter options: 'Web' with a magnifying glass icon and 'Images' with a camera icon. A list of search results is shown in a white box, including 'aegon classic', 'aegon classic tennis', 'aegon classic birmingham', 'aegon classic 2010', 'aegon classic 2011', 'aegon classic 2009', and 'aegon classic live scores'. At the bottom left, there is a 'SEARCH WEB' button with a hamburger menu icon. On the right, there are two preview cards. The first card is for 'LTA - AEGON Classic' and features a blue umbrella with the AEGON logo and the text 'Rain washes out Monday, chocolate prevails'. The second card is for 'WTA | Tournament Info | BIRMINGHAM' and features the WTA logo and a photo of a tennis player.

Axis “Search Layer” is a completely independent sub-application

# Sub-applications

The screenshot displays a mobile search interface with a dark grey background. On the left, a search bar is labeled 'SEARCH:' and contains the text 'aegon classic'. Below the search bar are two filter options: 'Web' with a magnifying glass icon and 'Images' with a camera icon. A list of search suggestions is shown on the right, including 'aegon classic tennis', 'aegon classic birmingham', 'aegon classic 2010', 'aegon classic 2011', 'aegon classic 2009', and 'aegon classic live scores'. At the bottom left, there is a 'SEARCH WEB' button with a hamburger menu icon. On the right side, there are two preview cards. The first card is for 'LTA - AEGON Classic' and features a blue umbrella with the AEGON logo. The second card is for 'WTA | Tournament Info | BIRMINGHAM' and features the WTA logo and a photo of a tennis player.

In mojito, it is a Mojito or a composition of Mojitos

## Lesson #4

Analyze each UI element individually



Native

VS



Web



Native

+



Web

**HTML**



**Compiled**

**VS**

**HTML** 



**Web-based**



VS



\$ mojito build

\$ mojito start

# The three choices



Native

VS



Compiled

VS



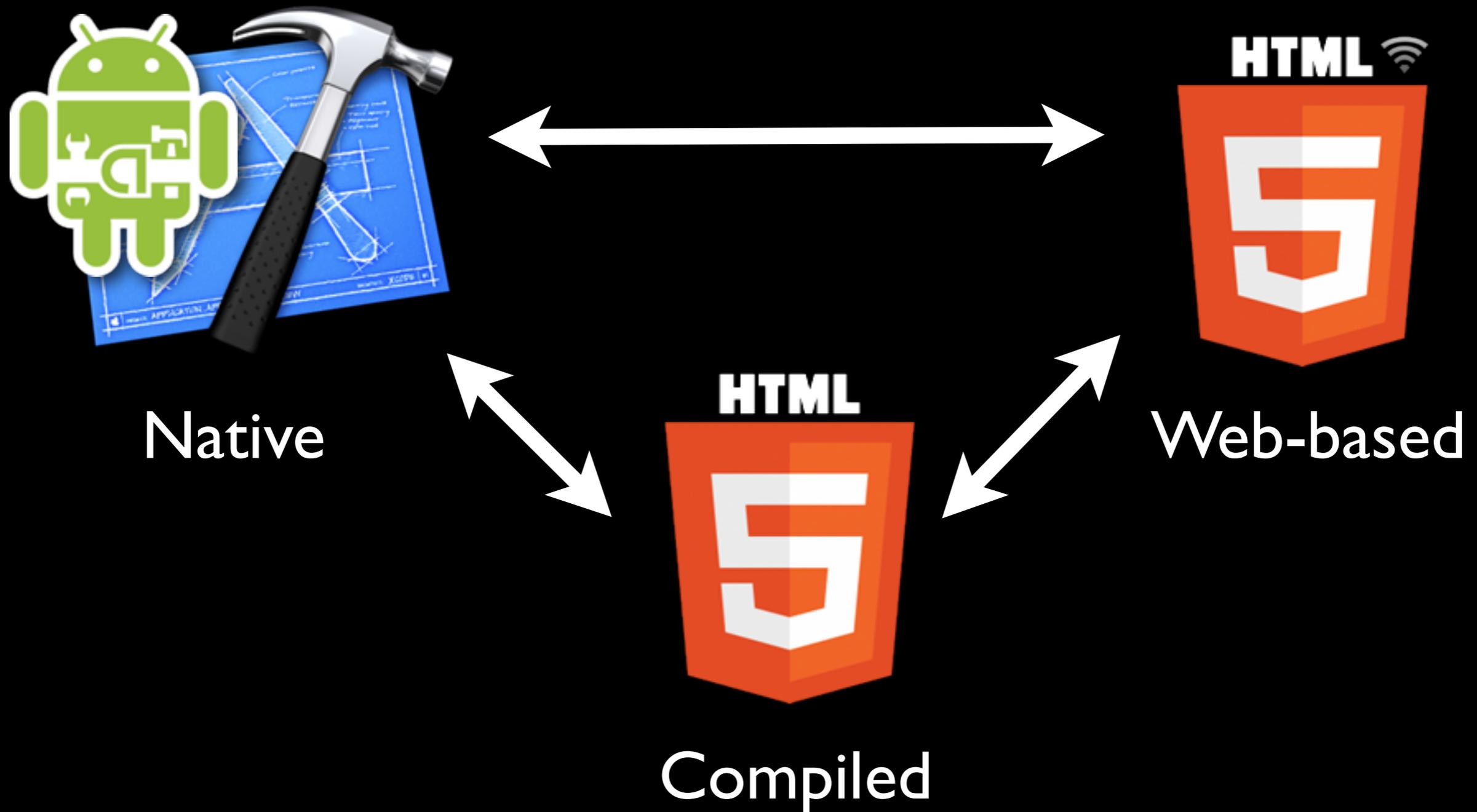
Web-based

## Lesson #5

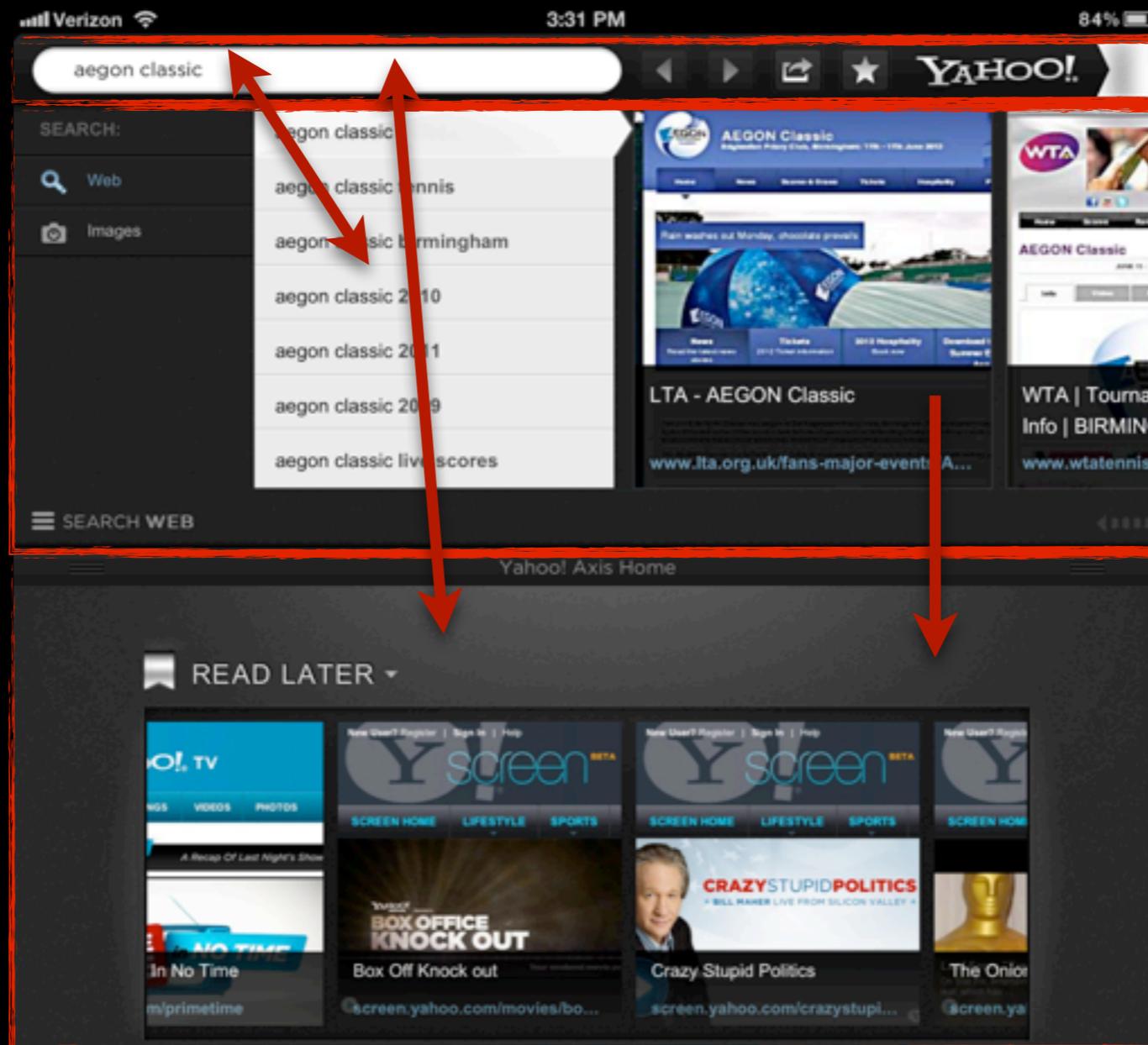
Abstract communication when possible

In *Axis*, we connect the pieces together  
using “Y.CL” abstraction!

# “Y.CL” enables Mojito Applications to talk to Native counterparts



# Y.CL in Axis



YUI Communication Layer  
(aka “Y.CL” is also open source)

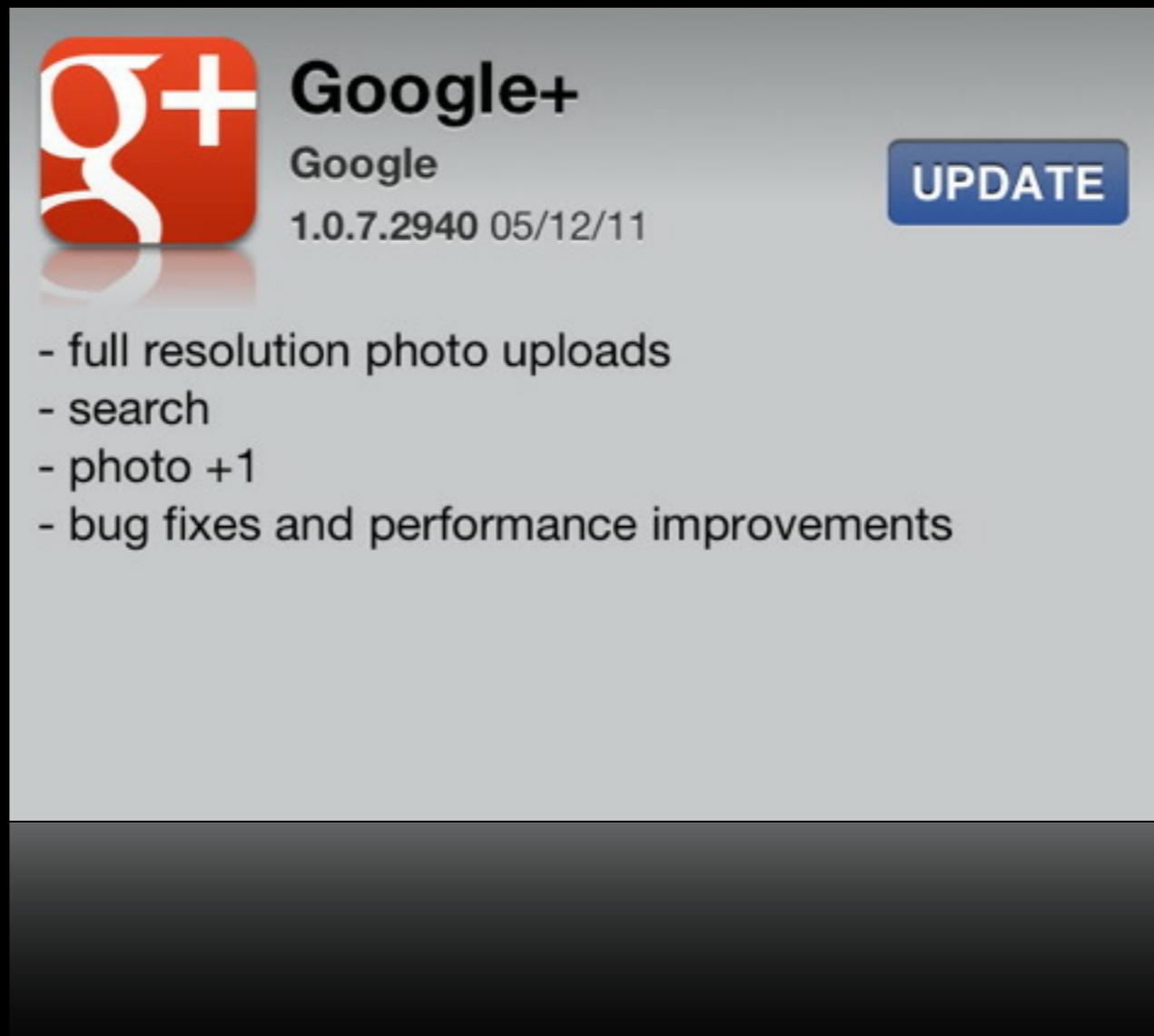
<http://yuilibrary.com/gallery/show/communication-layer>



## Lesson #6

Try to reduce fragmentation

# No need to issue an app update when using web-based sub-applications



The screenshot shows an update notification for the Google+ app. It features the Google+ logo (a red square with a white 'g' and a white plus sign) on the left. To the right of the logo, the text reads "Google+", "Google", and "1.0.7.2940 05/12/11". A blue button with the word "UPDATE" in white capital letters is positioned to the right of the version and date information. Below this header, a list of update features is displayed:

- full resolution photo uploads
- search
- photo +1
- bug fixes and performance improvements

## Lesson #7

Refreshing WebViews (HTML parts)  
can be painful

The *code* and *content* in a WebView might need to be refreshed programmatically



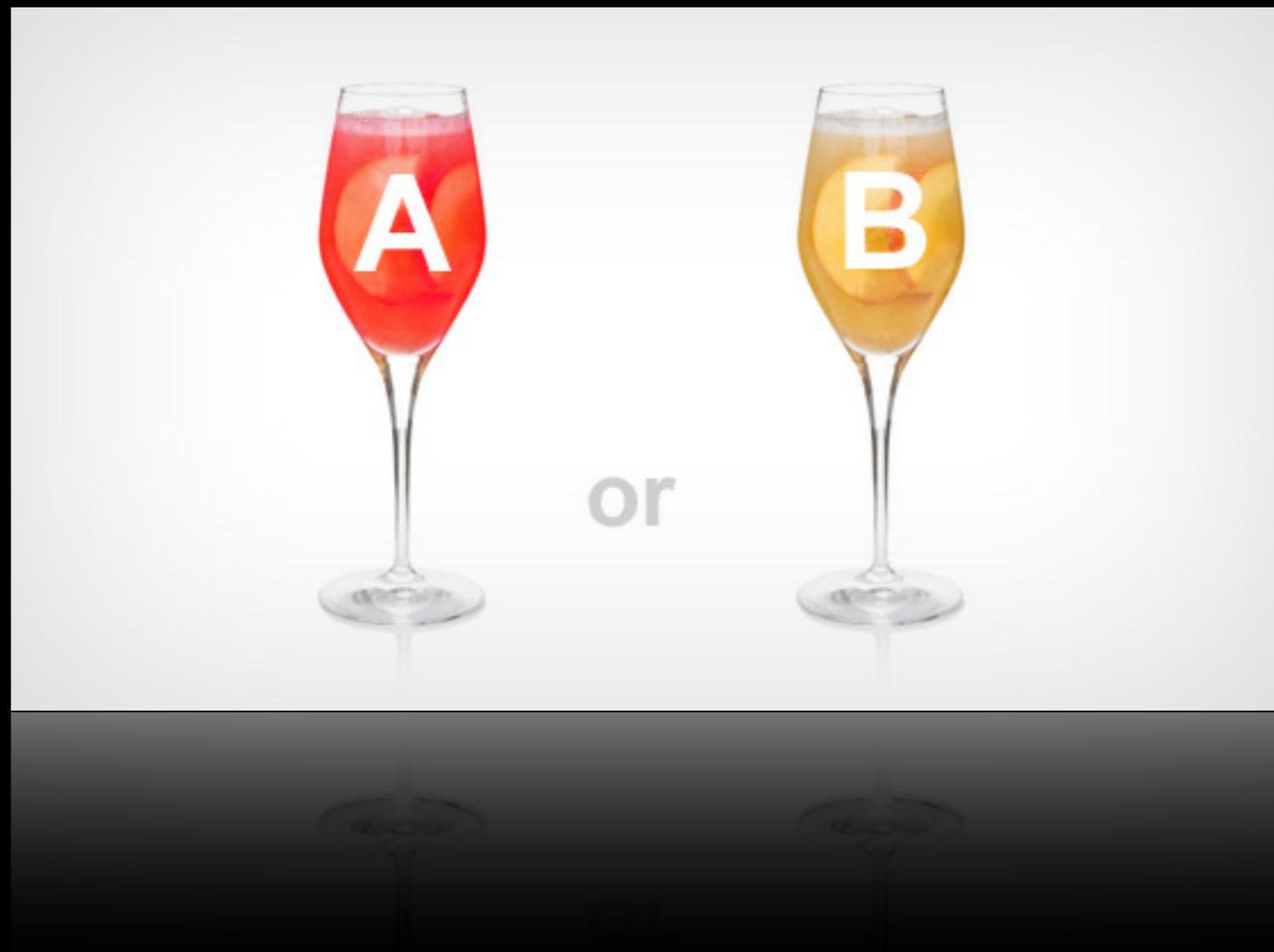
Refresh webviews when returning from background is enough for most cases

meteorjs, derbyjs and others  
are experimenting with  
hot-patches

## Lesson #8

It is very hard to experiment in  
iOS and Android

# Ideal for experiment-driven development



## Lesson #9

Expect network craziness

Verizon 3G

7:39 PM

38%

Type URL or Query here



YAHOO!

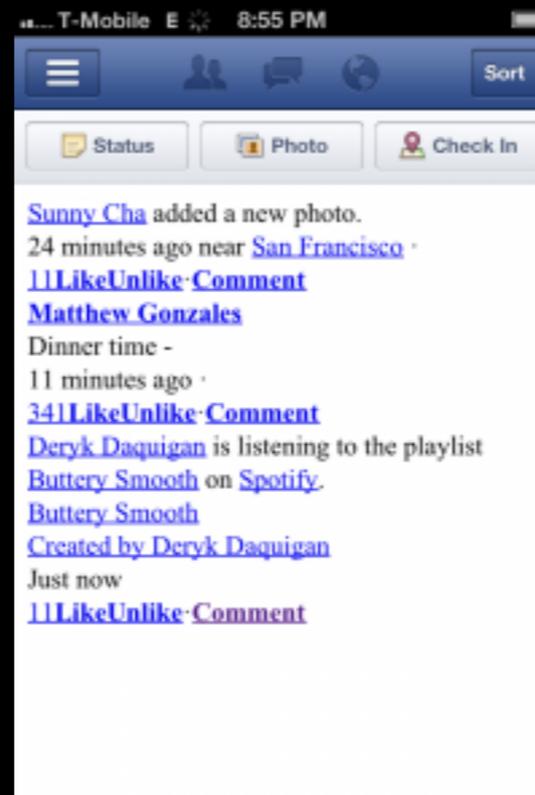


Network failures need to be controlled

## Lesson #10

**CSS *can also* fail when loading  
web-based apps**

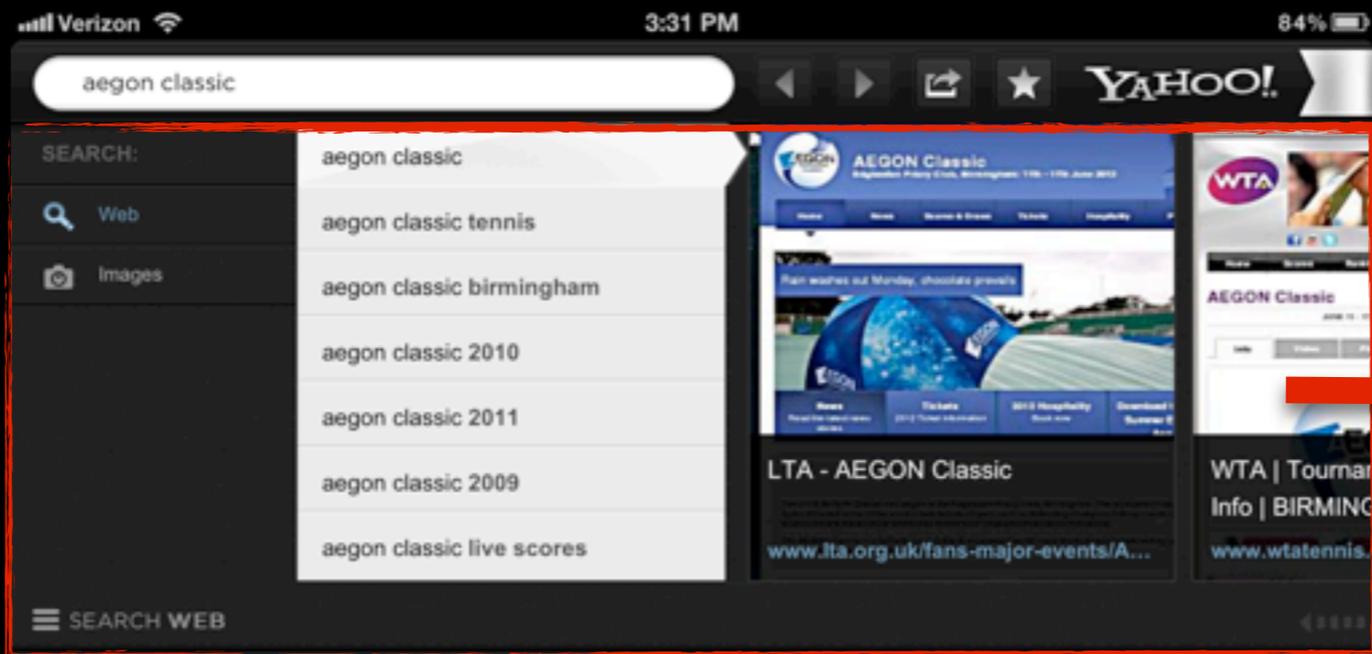
# Initialization needs to be controlled



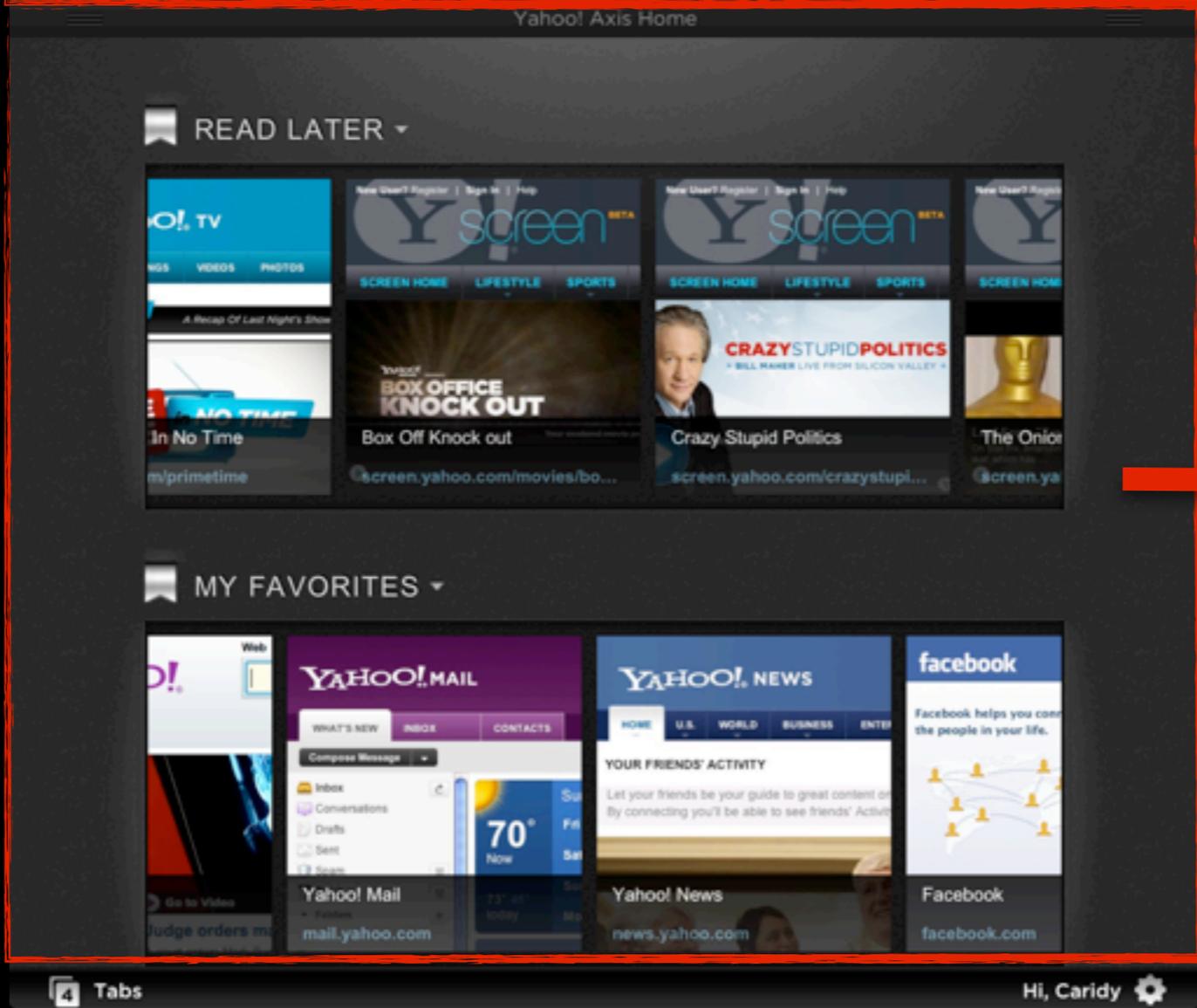
# Lesson #11

WebViews are not first class citizen in iOS

# Memory Warnings Experiment in iOS

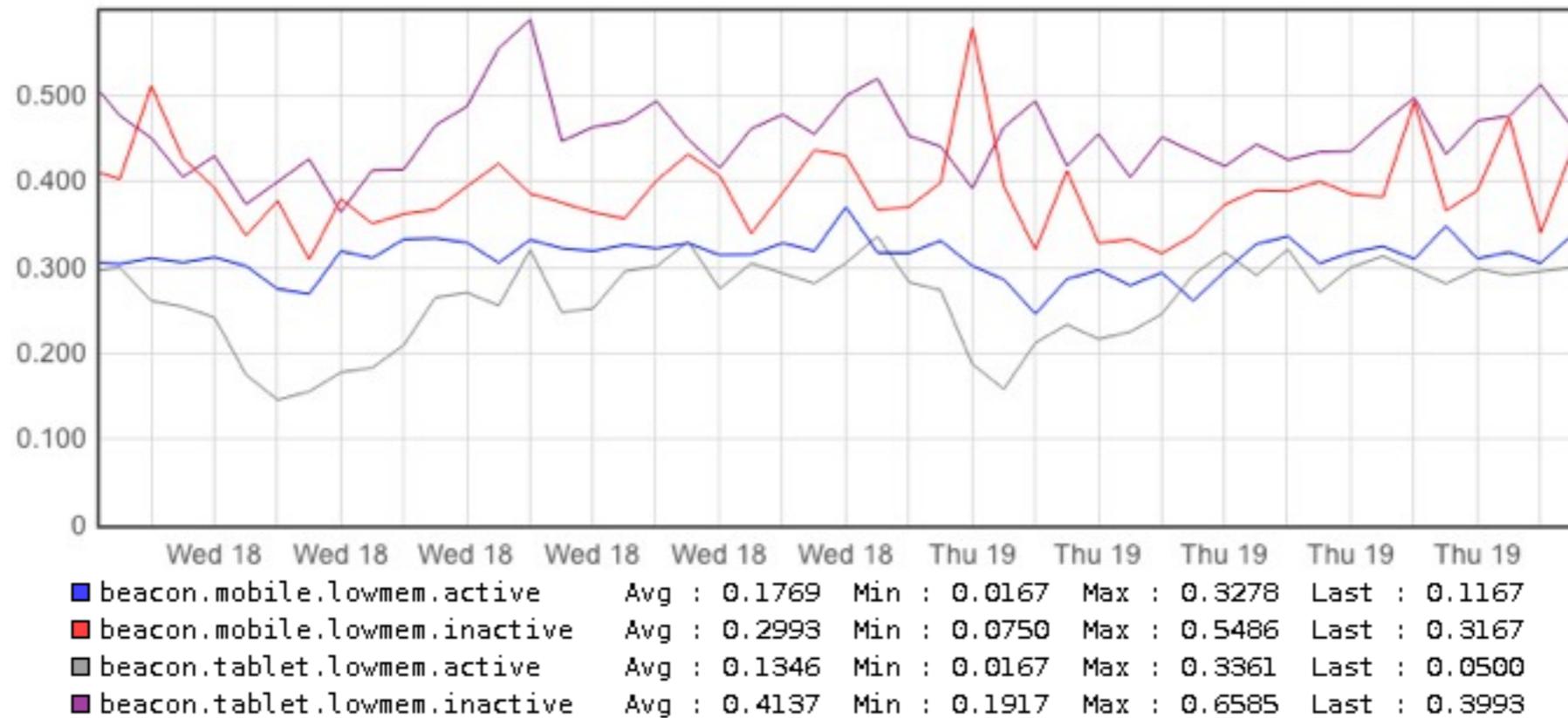


Search Layer  
WebView



Browser  
WebView

# Low Memory Warnings in iOS



Axis experiment



## Lesson #12

We need “*Compiled + Web-based*” auto-updating capabilities on WebViews NOW!

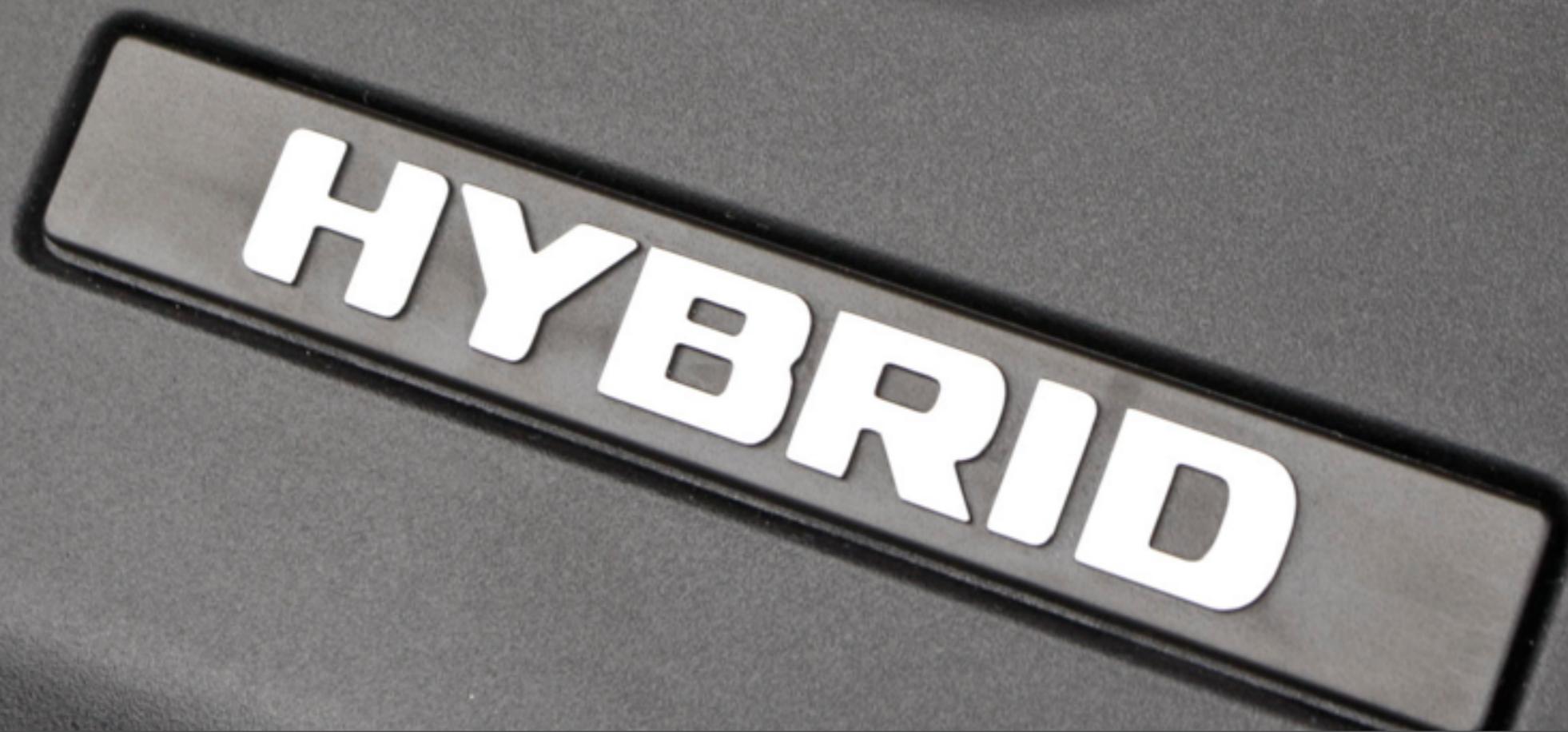
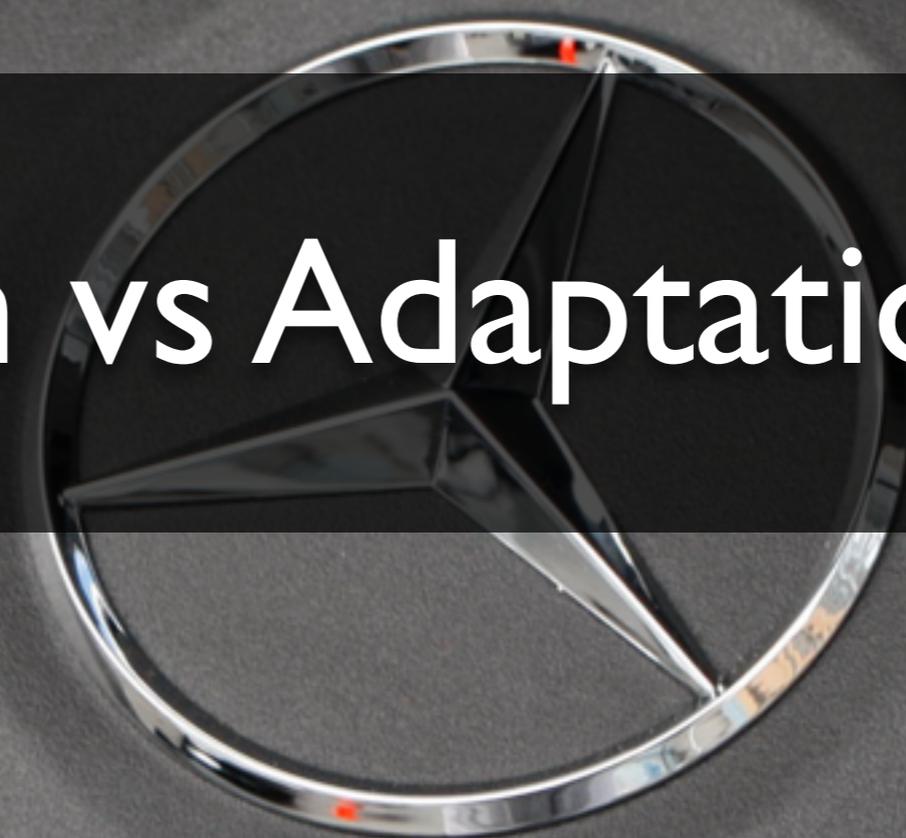


Compiled + Web-based

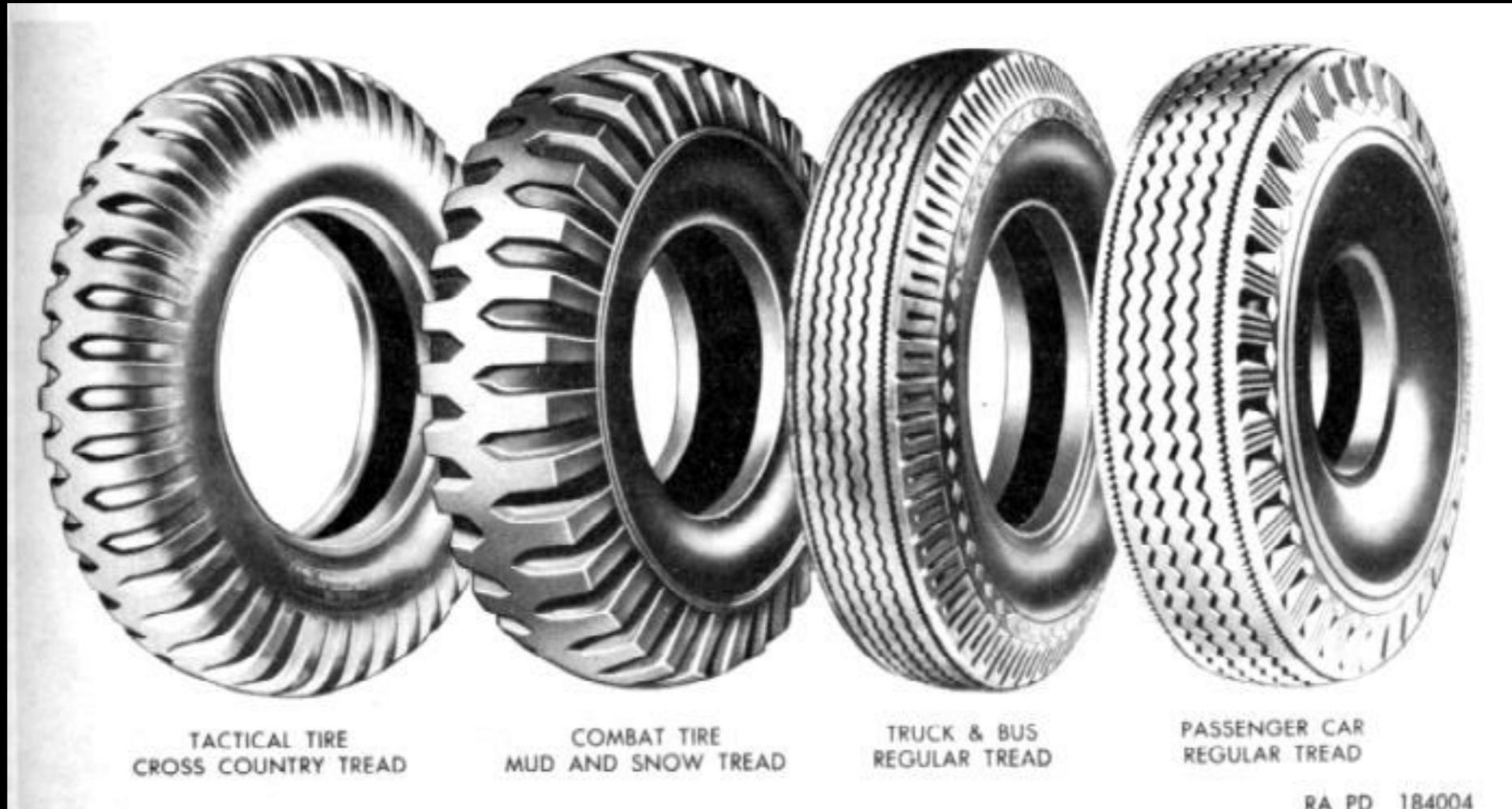
- Keep sub-apps locally
- Update them over the network
- Refresh them when possible
- Delegate actions over the network

Loading over the network is still easier and safer than stepping into the gray area of auto-upgrading HTML5 apps

# Optimization vs Adaptation



# Optimization vs Adaptation Analogy



CROSS COUNTRY TREAD  
TACTICAL TIRE

MUD AND SNOW TREAD  
COMBAT TIRE

REGULAR TREAD  
TRUCK & BUS

REGULAR TREAD  
PASSENGER CAR

# Optimization in Mojito



Performance as a product *feature*

Optimization in Mojito is about customizing the way your product behaves per *runtime* and per *request*.

It is about producing the right HTML, JS  
and CSS per *runtime* and per *request*.

# Mojito Runtimes

JavaScript on the  
browser

Native Bridges

iOS

Android

JavaScript on the  
server

# Mojito Context

- Locale (en-US, pt-BR)
- Device type (iphone, ipad)
- Network (AT&T, Verizon)
- CPU (low, medium, high)

Optimize per context

# /Mojits/Foo/definition.json

```
1  [
2    {
3      "settings": ["master"],
4
5      "config": {
6        "scrollview": {
7          "deceleration": 0.883,
8          "bounce": 0.65,
9        }
10     },
11     "metas": {
12     }
13   },
14   {
15     "settings": ["device:mobile"],
16
17     "config": {
18       "scrollview": {
19         "bounce": 0.01
20       },
21     },
22     "metas": {
23       "viewport": "width=device-width, ..."
24     }
25   }
26 ]
```

What to do in an event of a traffic surge?



# Where to render?

SEARCH:

Web

Images

aegon classic

aegon classic tennis

aegon classic birmingham

aegon classic 2010

aegon classic 2011

aegon classic 2009

aegon classic live scores

SEARCH WEB

**AEGON Classic**  
Edgbaston Priory Club, Birmingham: 17th - 17th June 2012

Home News Scores & Draws Tickets Hospitality

Rain washes out Monday, chocolate prevails

News Tickets 2012 Hospitality Downloaded Summer E

**LTA - AEGON Classic**

[www.lta.org.uk/fans/major-events/A...](http://www.lta.org.uk/fans/major-events/A...)

**WTA | Tournament Info | BIRMINGHAM**

[www.wtatennis.com](http://www.wtatennis.com)

card

# /Mojits/Bar/definition.json

```
1  [
2    {
3      "settings": [ "master" ],
4
5      "config": {
6        "serverSideRendering": true
7      }
8    },
9    {
10     "settings": ["device:mobile"],
11
12     "config": {
13       "serverSideRendering": false
14     }
15   },
16   {
17     "settings": ["cpu:high"],
18
19     "config": {
20       "serverSideRendering": false
21     }
22   }
23 ]
```

Control your dimensions in Mojito

# /dimensions.json

```
1  [
2    {
3      "dimensions": [
4        {
5          "network": {
6            "verizon": null,
7            "att": null
8          }
9        },
10       {
11         "device": {
12           "mobile": {
13             "android": null,
14             "iphone": null
15           },
16           "tablet": {
17             "ipad": null,
18             "kindle": null
19           },
20           "tv": null
21         }
22       }
23     ]
24   }
25 ]
```

# Adaptation in Mojito



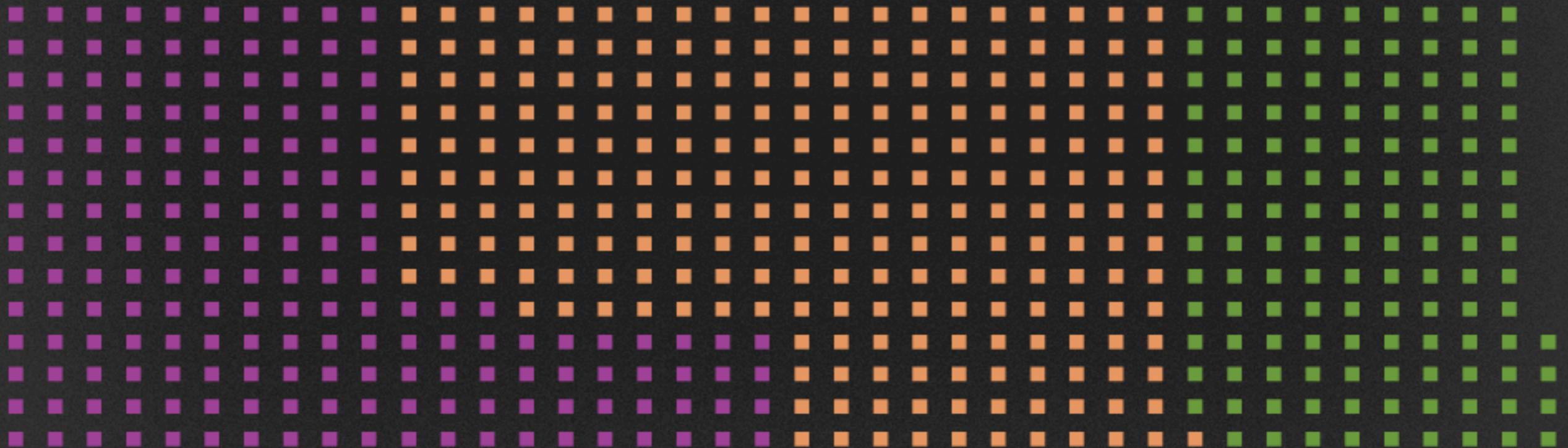
Adaptability as a product *feature*

Adaptation in Mojito is about customizing the UI per screen size, per connection speed, per feature detection, etc.

# It is about responsive UI

**547**  
MOCKS

*Every single one reviewed on the device it was designed for.*



■ DESKTOP

■ IPAD

■ IPHONE

# In Mojito, YUI covers a lot in terms of adaptation:

```
1 YUI().use('cache-offline', function() {
2
3     var cache = new Y.CacheOffline({
4         max: 99,
5         sandbox: 'foo' // prefix all entries with "foo"
6     });
7
8     cache.add('bar', {baz: 'data to store'});
9
10 });
```

# Adapt per:

- Screen size (css media queries)
- Orientation (landscape vs portrait)
- Connection Speed (3G)
- Memory (iOS memory warning)
- Feature

Let's recap

Axis runs on Yahoo! Cocktails

**Axis is a hybrid application composed of independent small native and HTML5 sub-applications**

HTML5 parts were written on  
Yahoo! Mojito, an open source  
application framework  
on top of YUI and Node.js

Axis leverages Mojito context to optimize and adapt those HTML5 parts

Axis leverages Y.CL as the main infrastructure to connect different parts



# Mojito JavaScript Application Framework

<http://github.com/yahoo/mojito>

Thank you!

@caridy