

The State of Hybrid

TJ VanToll | [@tjvantoll](#) | [tjvantoll.com](#)



Agenda

- The past
- Now
 - Tools
 - Performance
- The future

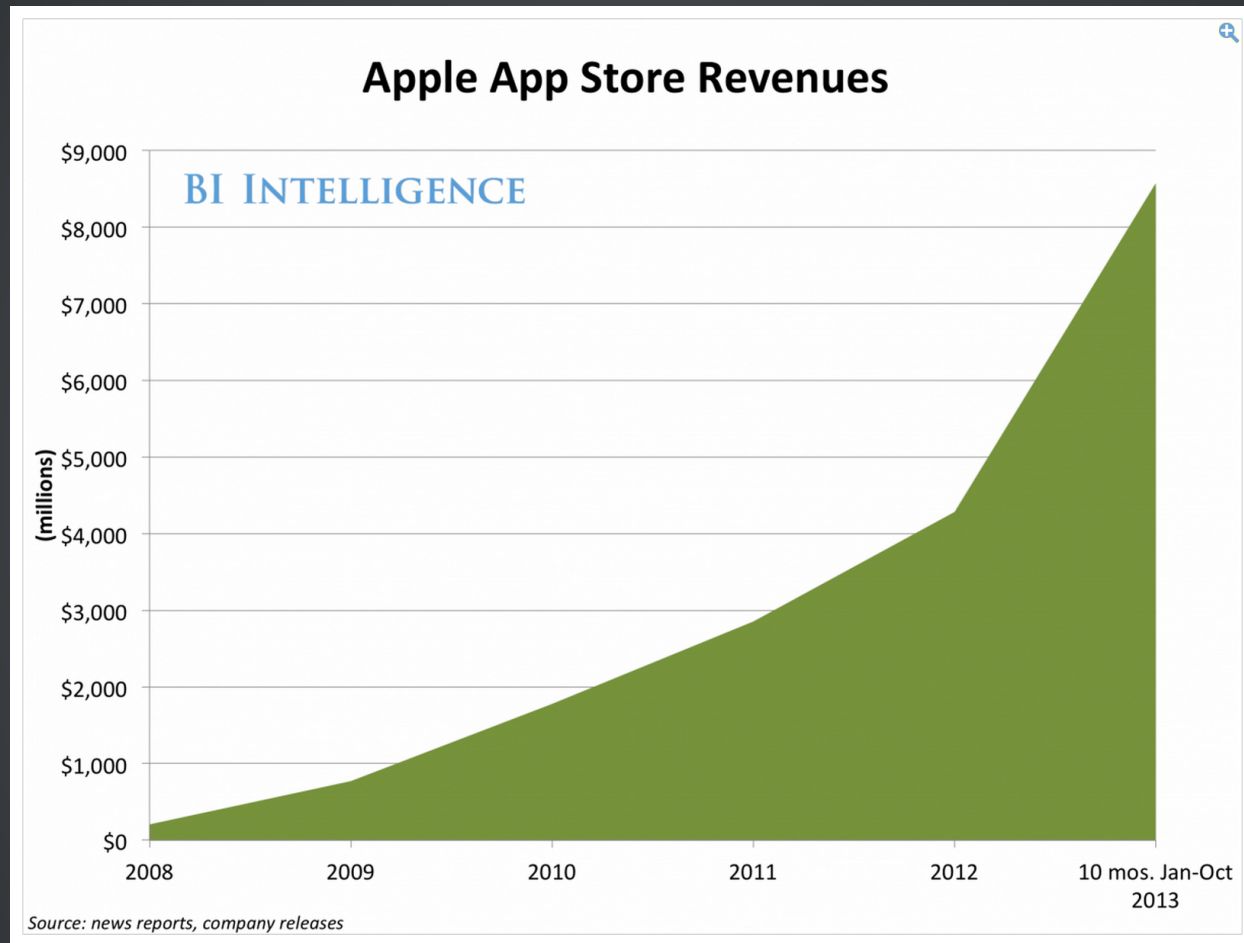
"The full Safari engine is inside of iPhone. And so, you can write amazing Web 2.0 and Ajax apps that look exactly and behave exactly like apps on the iPhone."

Steve Jobs, 2007

(source)

iOS 1 had no app store.

iOS 2 did. It worked out alright.



<http://www.businessinsider.com/chart-of-the-day-apple-app-store-revenues-2013-6>

App Store Sales Top \$10 Billion in 2013

Record-Breaking December with Over \$1 Billion in Sales

CUPERTINO, California—January 7, 2014—Apple® today announced that customers spent over \$10 billion on the App Store™ in 2013, including over \$1 billion in December alone. App Store customers downloaded almost three billion apps in December making it the most successful month in App Store history. Apple's incredible developers have now earned \$15 billion on the App Store.

<http://www.apple.com/pr/library/2014/01/07App-Store-Sales-Top-10-Billion-in-2013.html?sr=hotnews.rss>

In 2013, the iOS App Store revenue was higher than the GDP of 60 countries.



Others had similar ideas



Target OS	Development OS	Language
Apple iOS	Apple OS X	Objective C
Google Android	*	Java (Apache Harmony-ish Dalvik Interpreter)
RIM BlackBerry	Windows, OS X	HTML, CSS and JS. Also: Java
Windows Phone	Windows	Any .NET citizen (Silverlight runtime)
Samsung Bada	Windows	C++
HP webOS	*	HTML, CSS and JS (Also: NodeJS!)
Symbian, MeeGo	*	C++ (Qt)

Table is from Brian Leroux's [excellent Debugging Mobile talk](#).

Gartner Hype Cycle

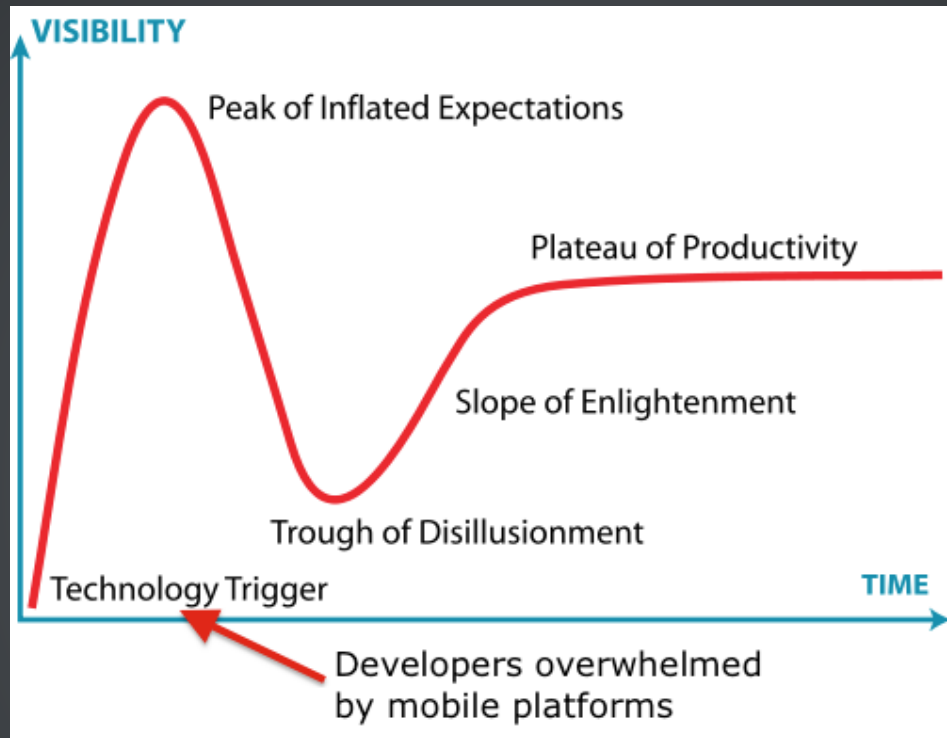
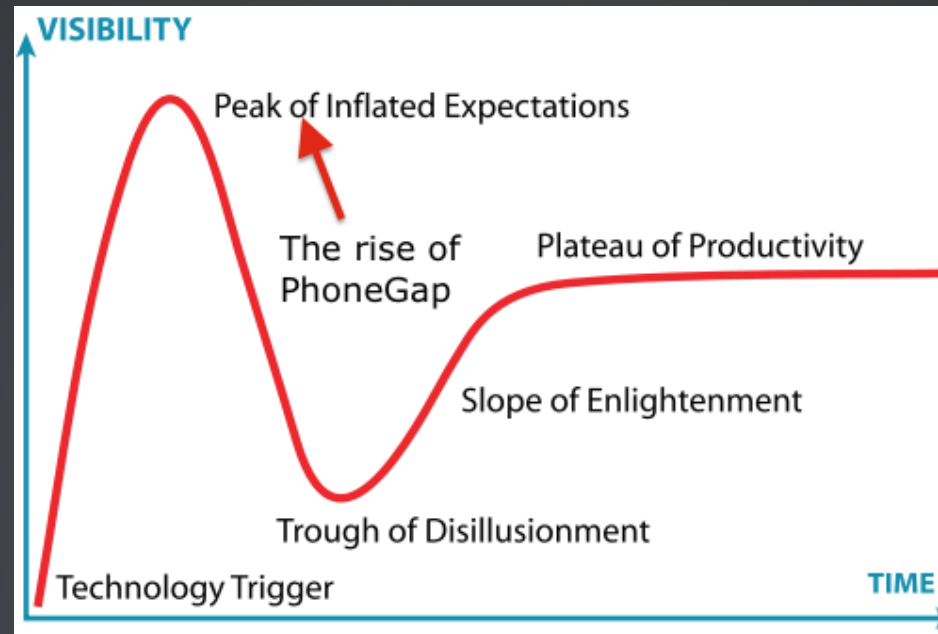


Image Source: <http://bimandintegrateddesign.com/tag/gartners-hype-cycle/>

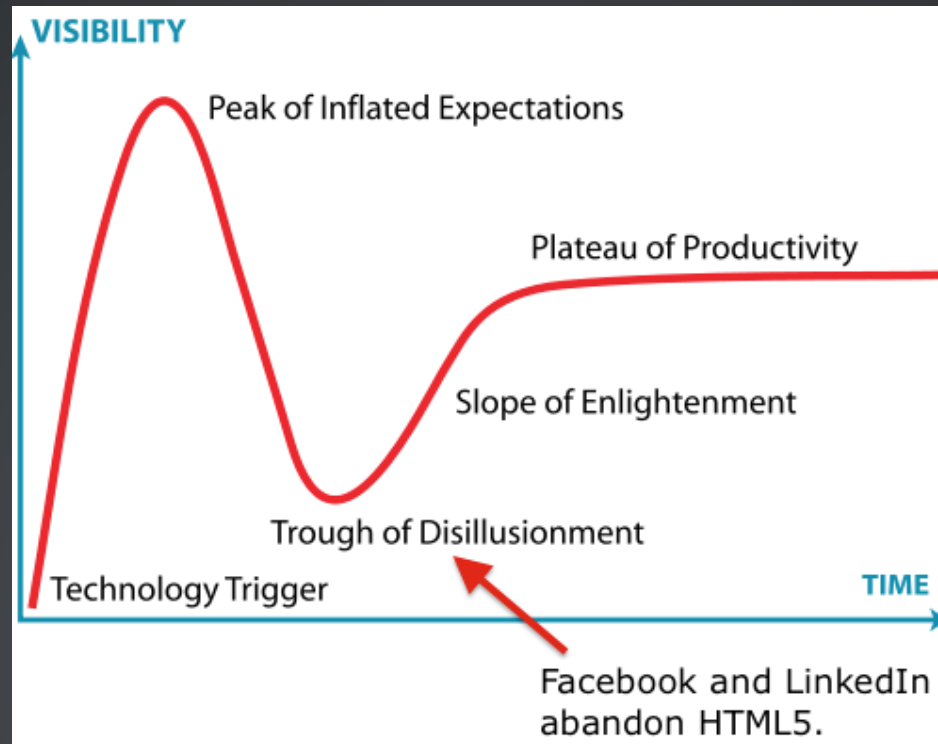
Hybrid



PhoneGap







"the biggest mistake that we made, as a company, is betting too much on HTML5 as opposed to native"

Mark Zuckerberg, 2012

Why LinkedIn dumped HTML5 & went native for its mobile apps

Source <http://venturebeat.com/2013/04/17/linkedin-mobile-web-breakup/>

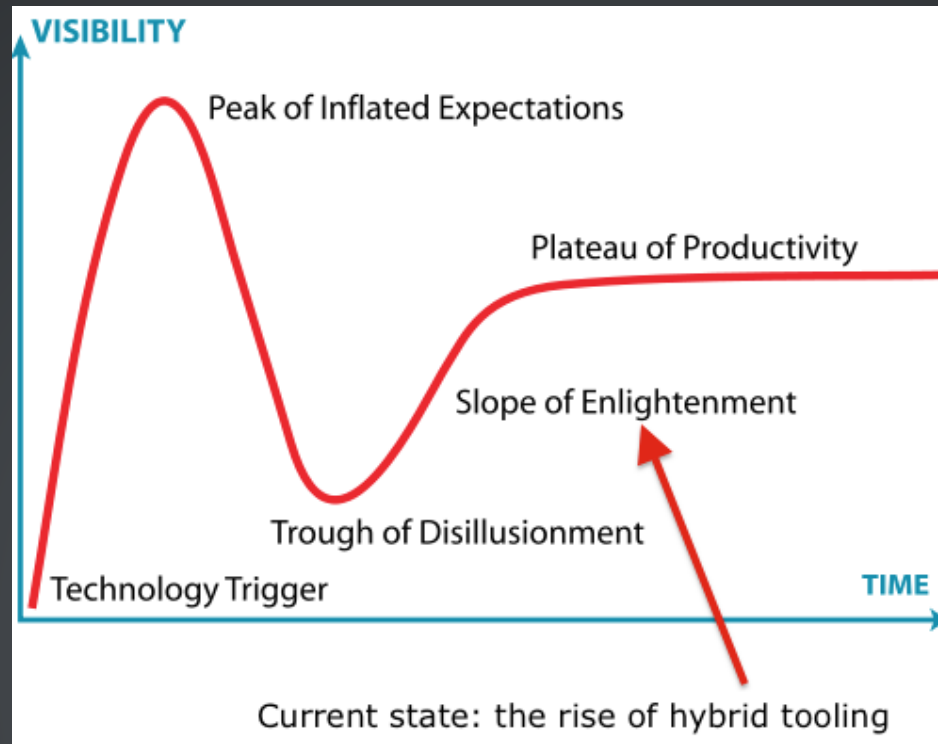
Why?

“The lack of tooling in mobile browsers makes it very difficult to dig down and find out what the real issues are. Hence tooling, or rather, lack thereof is a key issue.”

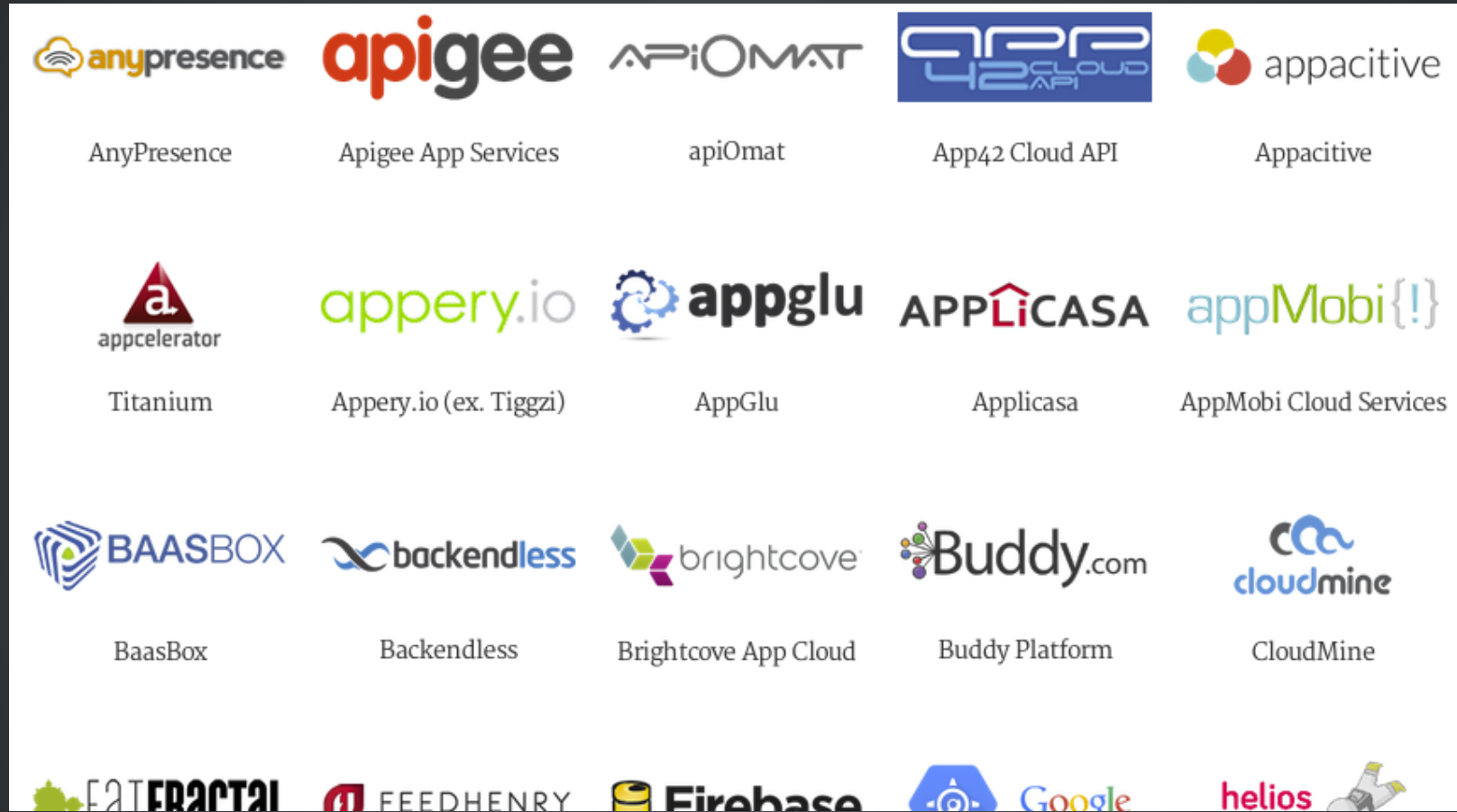
Tobie Langel, Facebook Engineer, [September 2012](#)

"[t]ooling support – having a debugger that actually works, performance tools that tell you where the memory is running out."

Kiran Prasad, LinkedIn senior director of mobile engineering,
April 2013



An explosion of tooling



The Market



Benedict Evans
@BenedictEvans



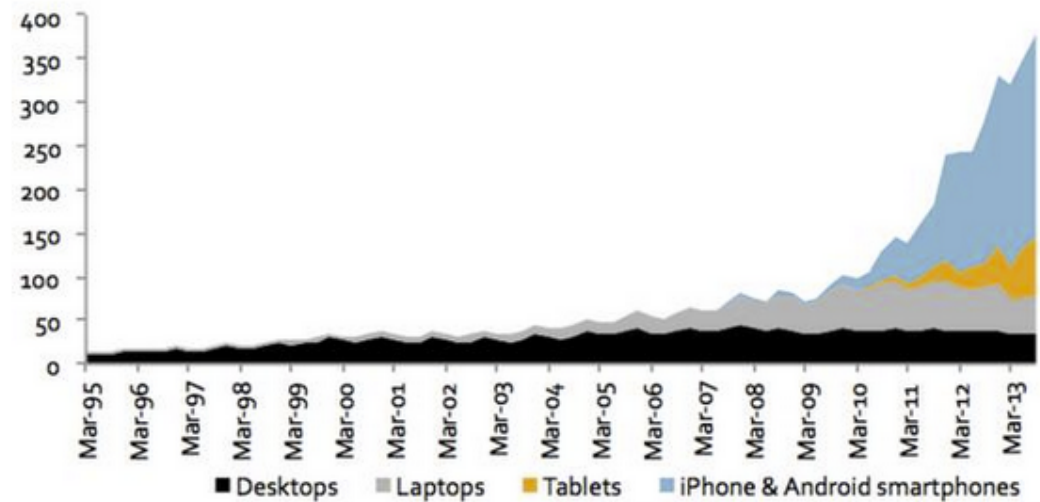
[Follow](#)

The platform wars are fun to talk about, but this is what matters.

pic.twitter.com/g9F9RG4Vvc

[Reply](#) [Retweet](#) [Favorite](#) [More](#)

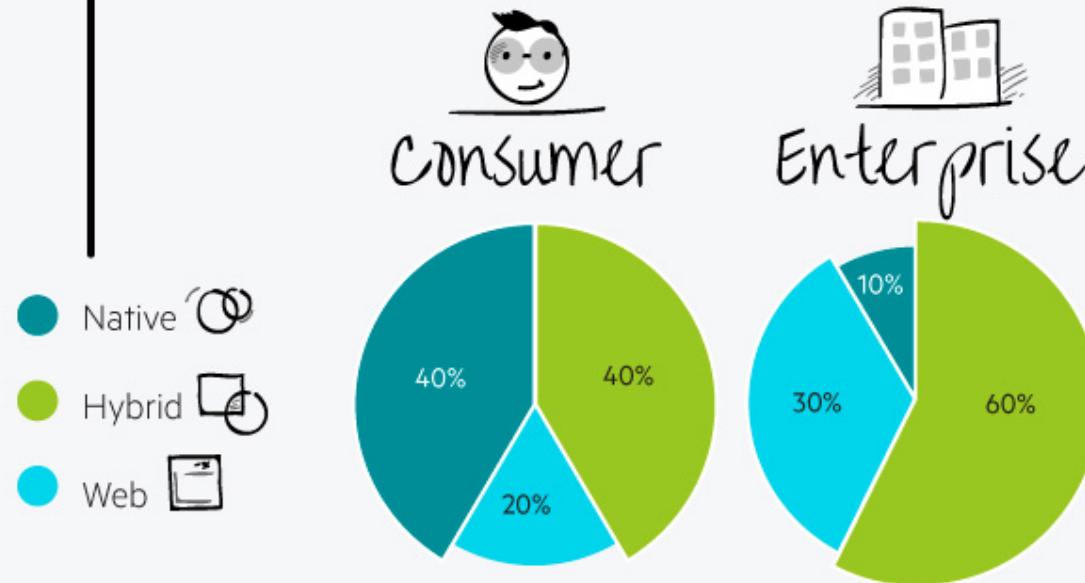
Global unit sales (m)



[Source: Gartner, Apple, Google, a16z]

<https://twitter.com/BenedictEvans/status/450495875211472896>

Gartner: By 2016, More Than 50 % of Apps will be Hybrid



Source: Gartner's 2013 Mobile and Wireless Predictions (February 4, 2013)



My Job

*"How does Kendo UI Mobile compare to
ChocolateChip?"*

My First Thought



The Correct Thought

Ionic



Ionic

The image shows a browser window displaying the Ionic framework website. The browser's address bar shows the URL `ionicframework.com`. The website has a blue header with the Ionic logo and navigation links for "Getting Started", "Docs", "Examples", "Forum", and "Blog". The main content area features the heading "Create amazing apps" and a sub-headline: "The beautiful, open source front-end framework for developing hybrid mobile apps with HTML5." Below this are two buttons: "Download beta" and "Get started". To the right is a 3D rendering of a white smartphone displaying a weather application with a sunset background and a temperature of 10°. Below the phone is a link for "Ionic Weather Demo App". At the bottom, there are social media statistics: "4,382 Stars", "458 Forks", and "4,249 Followers". A footer section contains an email subscription form with the text "Enter your email for the latest ionic news" and a "Subscribe" button.

ionic Getting Started Docs Examples Forum Blog

Create amazing apps

The beautiful, open source front-end framework for developing hybrid mobile apps with HTML5.

[Download beta](#)

[Get started](#)

MIT Licensed - v1.0.0-beta.1 "aclarinum" - 2014-09-25

[Ionic Weather Demo App](#)

4,382 Stars 458 Forks 4,249 Followers

Enter your email for the latest ionic news [Subscribe](#)

Kendo UI Mobile

The screenshot shows the Kendo UI website in a browser. The browser's address bar displays "www.telerik.com/kendo-ui". The website's navigation menu includes "Telerik", "PRODUCTS", "ENTERPRISE", "FREE TRIALS", "PRICING", "SUPPORT & LEARNING", "COMPANY", "Your Account", and "Telerik Platform". The main heading is "Kendo UI" with the subtext "Everything you need to build sites and apps with pure JavaScript and HTML5". A calendar widget is shown on a mobile device, with a handwritten note "Responsive and adaptive jQuery widget" pointing to it. Below the main heading is a navigation bar with "Kendo UI", "Features", "Widgets", "Support & Learning", "New Features & Roadmap", "Demos", "Pricing", and "Try now". The "Key Features" section includes three items: "Complete Set of HTML5 Widgets and Features", "Both Commercial and Open Source Licensing", and "Built-In, Yet Customizable Themes".

Kendo UI
Everything you need to build sites and apps with pure JavaScript and HTML5

Responsive and adaptive jQuery widget

Key Features

- Complete Set of HTML5 Widgets and Features**
Kendo UI is everything you need to build modern web and mobile apps with HTML5 and JavaScript.
- Both Commercial and Open Source Licensing**
Choose the functionality and support plan that best suits your project.
- Built-In, Yet Customizable Themes**
Apply one of the 11 built-in themes or customize them in seconds with the ThemeBuilder tool.

Now free and open source as part of **Kendo UI Core**.

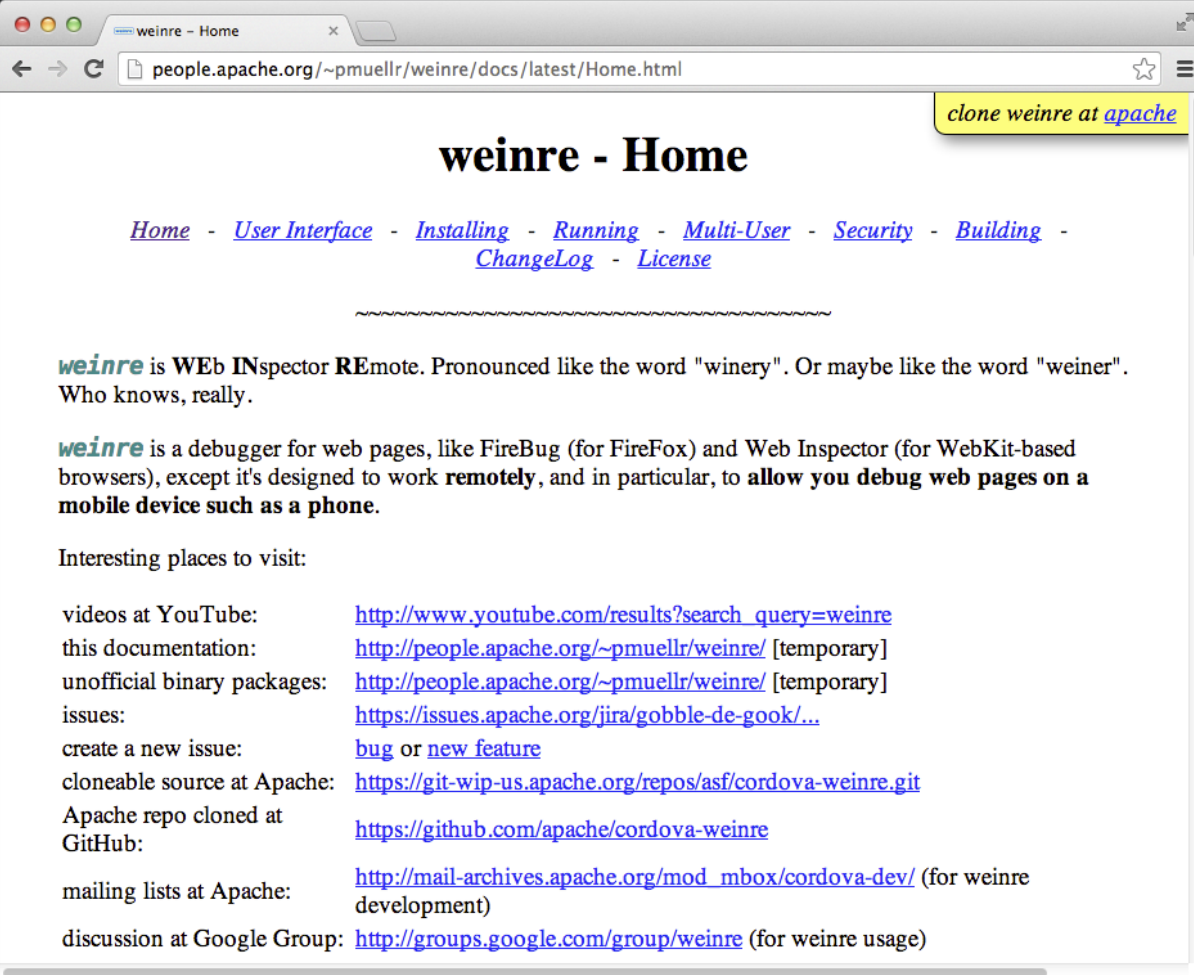
Tooling improvement #1: UI frameworks

Demo

cuteness.io

Tooling improvement #2: remote debugging

Weinre

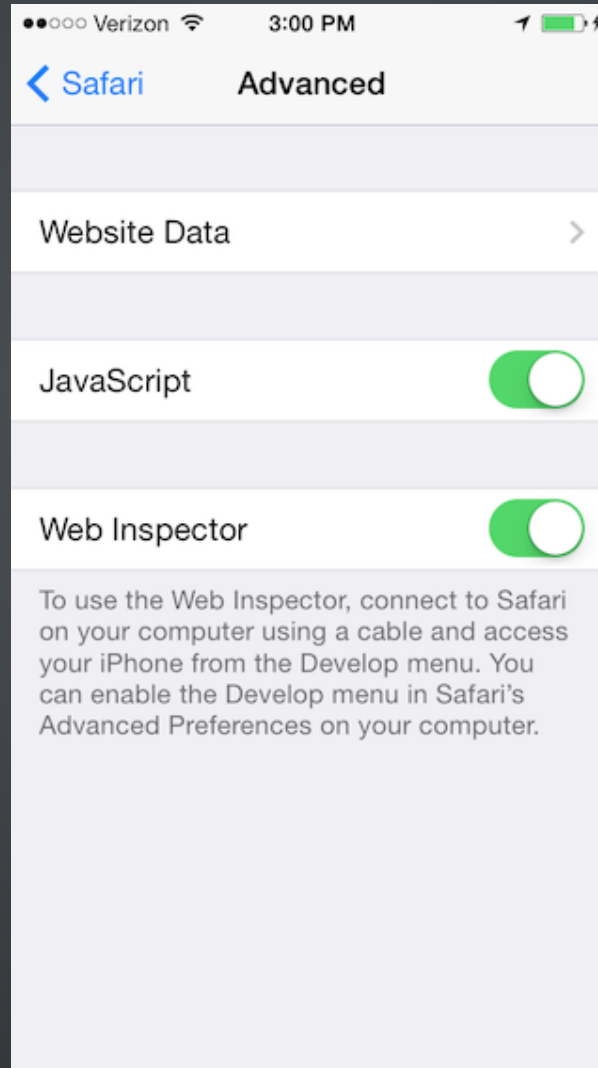


The screenshot shows a browser window with the title "weinre - Home" and the address bar containing "people.apache.org/~pmuellr/weinre/docs/latest/Home.html". A yellow banner in the top right corner says "clone weinre at [apache](#)". The main heading is "weinre - Home". Below it is a navigation menu with links: [Home](#) - [User Interface](#) - [Installing](#) - [Running](#) - [Multi-User](#) - [Security](#) - [Building](#) - [ChangeLog](#) - [License](#). A decorative line follows. The text explains that **weinre** is **WEb INspector REmote**, pronounced like "winery" or "weiner". It is a debugger for web pages, designed to work **remotely** and **allow you debug web pages on a mobile device such as a phone**. A section titled "Interesting places to visit:" lists various resources with links: videos at YouTube (http://www.youtube.com/results?search_query=weinre), this documentation (<http://people.apache.org/~pmuellr/weinre/>), unofficial binary packages (<http://people.apache.org/~pmuellr/weinre/>), issues ([https://issues.apache.org/jira/gobble-de-gook/...](https://issues.apache.org/jira/gobble-de-gook/)), create a new issue ([bug](#) or [new feature](#)), cloneable source at Apache (<https://git-wip-us.apache.org/repos/asf/cordova-weinre.git>), Apache repo cloned at GitHub (<https://github.com/apache/cordova-weinre>), mailing lists at Apache (http://mail-archives.apache.org/mod_mbox/cordova-dev/), and discussion at Google Group (<http://groups.google.com/group/weinre>).

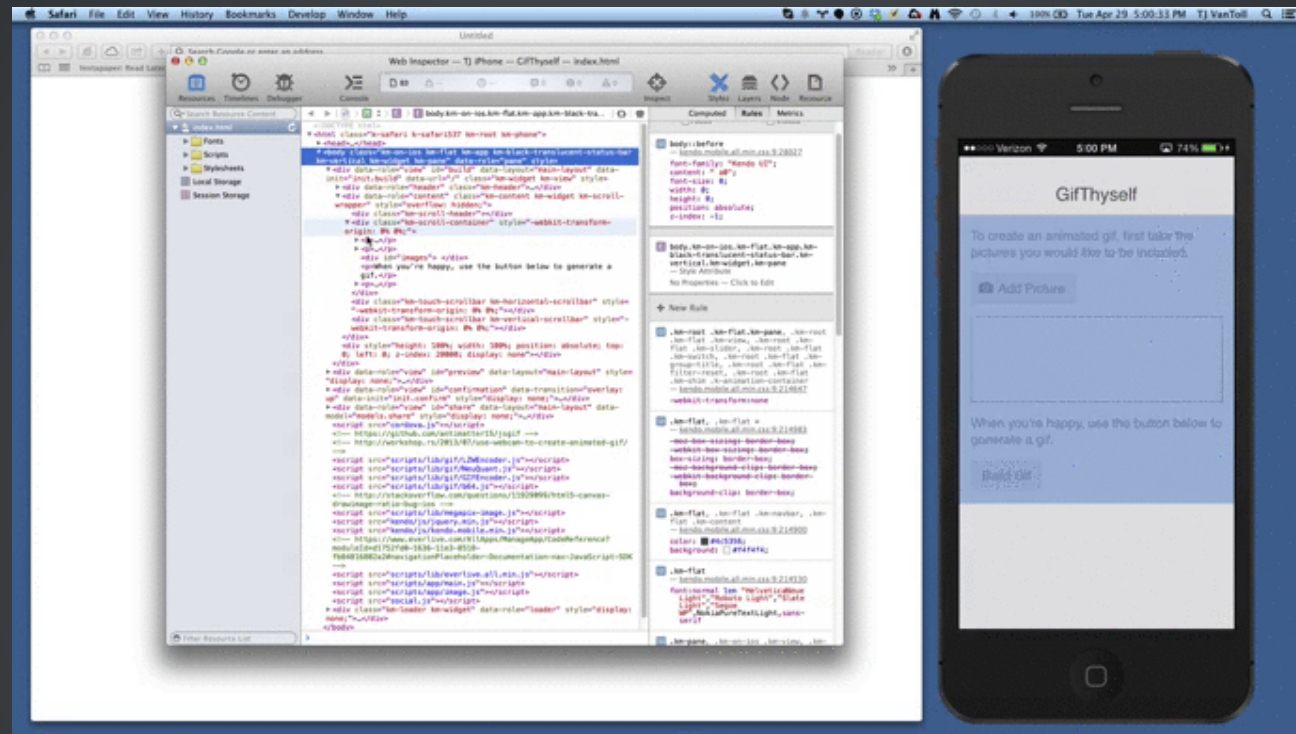
<http://people.apache.org/~pmuellr/weinre/docs/latest/Home.html>

iOS Remote Debugging (iOS 6+)

Settings --> Safari --> Advanced



iOS Remote Debugging (iOS 6+)



Chrome for Android Remote Debugging (Android 4.4+)

"[T]ap Build number seven times. Yup, just tap it 7 times, even if it seems crazy."



Via <https://developers.google.com/chrome-developer-tools/docs/remote-debugging>

about:inspect

chrome://inspect/#devices

DevTools


- Devices
- Pages
- Extensions
- Apps
- Shared workers
- Other

Devices

Discover USB devices Port forwarding...


Nexus 7 #015D172C9A3BF817

Chrome (33.0.1750.170) Open tab with url Open

 - jsFiddle demo <http://jsfiddle.net/draft/>
[inspect](#) [focus tab](#) [reload](#) [close](#)

WebView in com.google.android.apps.magazines (Version/4.0 Chrome/30.0.0.0)

WebView in com.telerik.GifThyself (Version/4.0 Chrome/30.0.0.0)

 GifThyself <file:///storage/emulated/0/lenium/com.telerik.GifThyself/index.html>
at (0, 33) size 800 × 1172
[inspect](#)

Chrome for Android Remote Debugging (Android 4.4+)

The screenshot displays the Chrome DevTools interface with the following components:

- Top Bar:** Search icon, tabs for Elements, Network, Sources, Timeline, Profiles, Resources, Audits, and Console. On the right, there are icons for expand, settings, and close.
- Left Panel (Elements):** Shows the DOM tree. The selected node is `<body class="hp vasq" onload="try{if(!google.j.b){document.f&&document.f.q.focus();document.gbqf&&document.gbqf.q.focus();}}catch(e){if(document.images)new Image().src='/images/nav_logo170.png' alink="#dd4b39" bgcolor="#fff" id="gsr" link="#12c" text="#222" vlink="#61c">`. Below it, a `<div class="ctr-p" id="viewport">` contains a script tag and a table.
- Right Panel (Styles):** Shows the style rules for the selected element. The `element.style` rule is empty. The `body, html` rule has `font-size: small;`. The `body` rule has `background-color: #fff;` and `color: #222;`. The `body, td, a, p, .h` rule has `font-family: arial, sans-serif;`. The `html, body` rule has `height: 100%;` and `margin: 0;`. The `body[Attributes Style]` rule has `background-color: rgb(255, 255, 255);` and `color: rgb(34, 34, 34);`. The `body` rule from the user agent stylesheet has `display: block;` and `margin: 8px;`. The `Inherited from html` rule has `font-size: small;`.
- Bottom Bar:** Shows the breadcrumb `html > body#gsr.hp.vasq`.

jsHybugger



Debug Android web apps with Chrome DevTools

Works on Android 2.3.3+

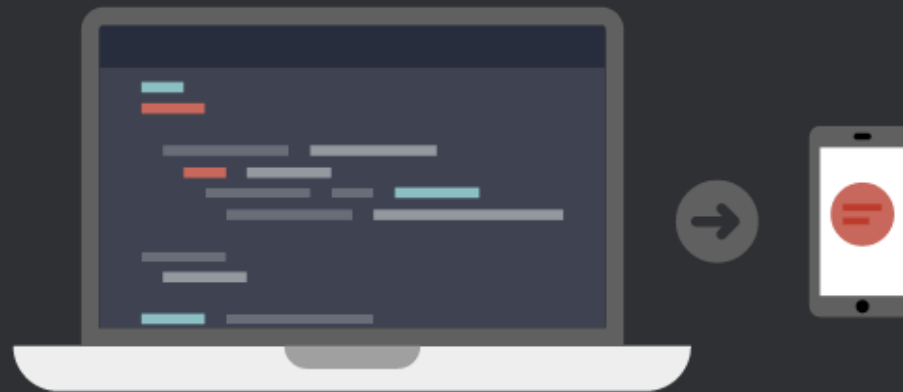
Tooling improvement #3: Companion Apps

AppBuilder companion app

Rapid on-device testing

The PhoneGap Developer App

Develop locally then see the changes instantly on your mobile device.



Demo

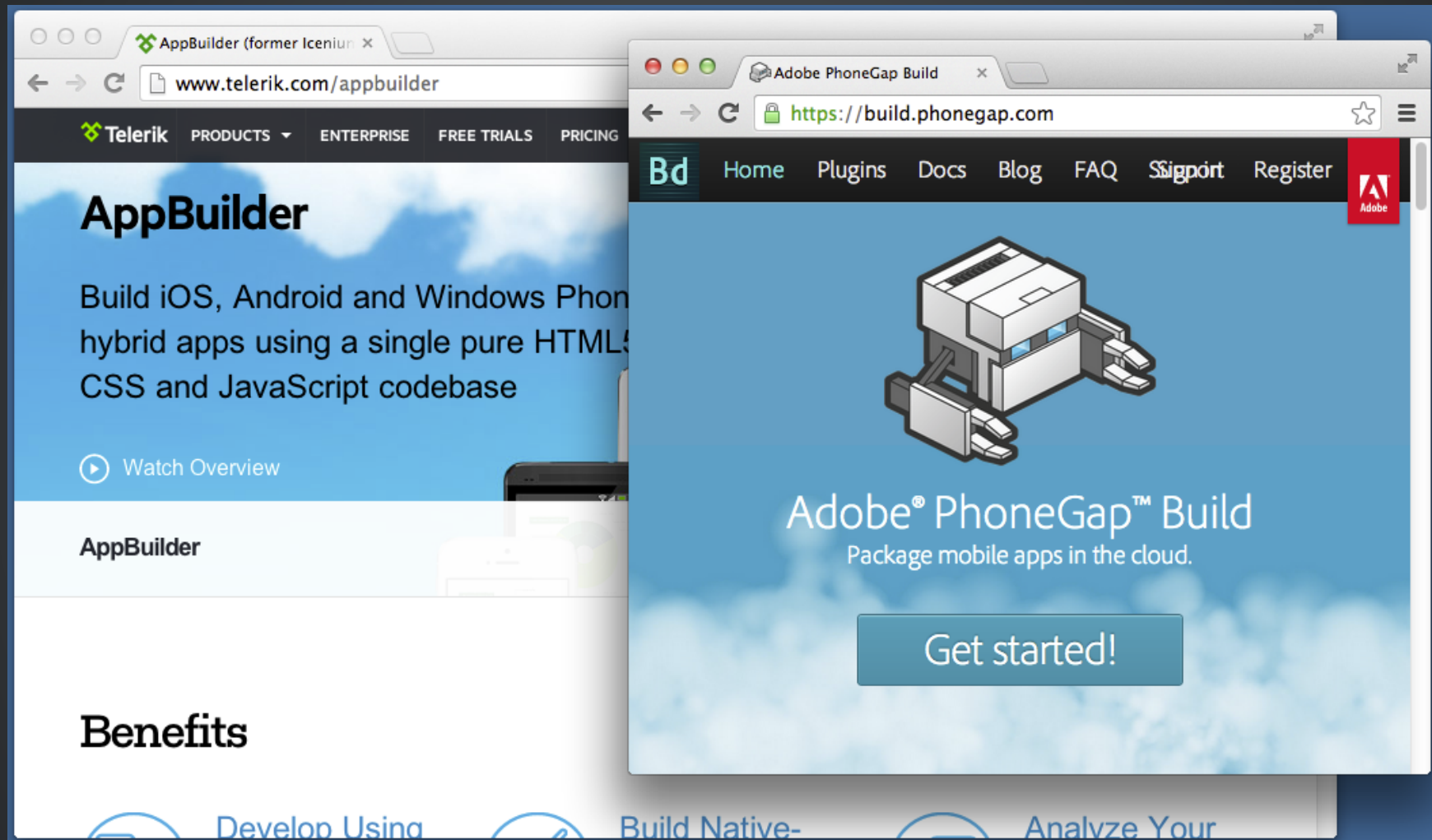
The image is a composite of three parts illustrating a web application's responsive design. On the left, a code editor shows HTML and CSS code. The HTML code defines a header with the text 'Telerik AppBuilder!'. The CSS code styles the header with a red color and a font size of 3em. In the center, a smartphone displays the rendered application, where the text is large and centered, and the background features a graphic of several mobile phones. On the right, a desktop browser window shows the same application, where the text is smaller and the background graphic is also scaled to fit the larger screen.

```
18 <div data-role="view">  
19   <h1>Telerik  
20     AppBuilder!</h1>  
  
100  
161 h1 {  
162   color: red;  
163   font-size: 3em;  
164 }
```

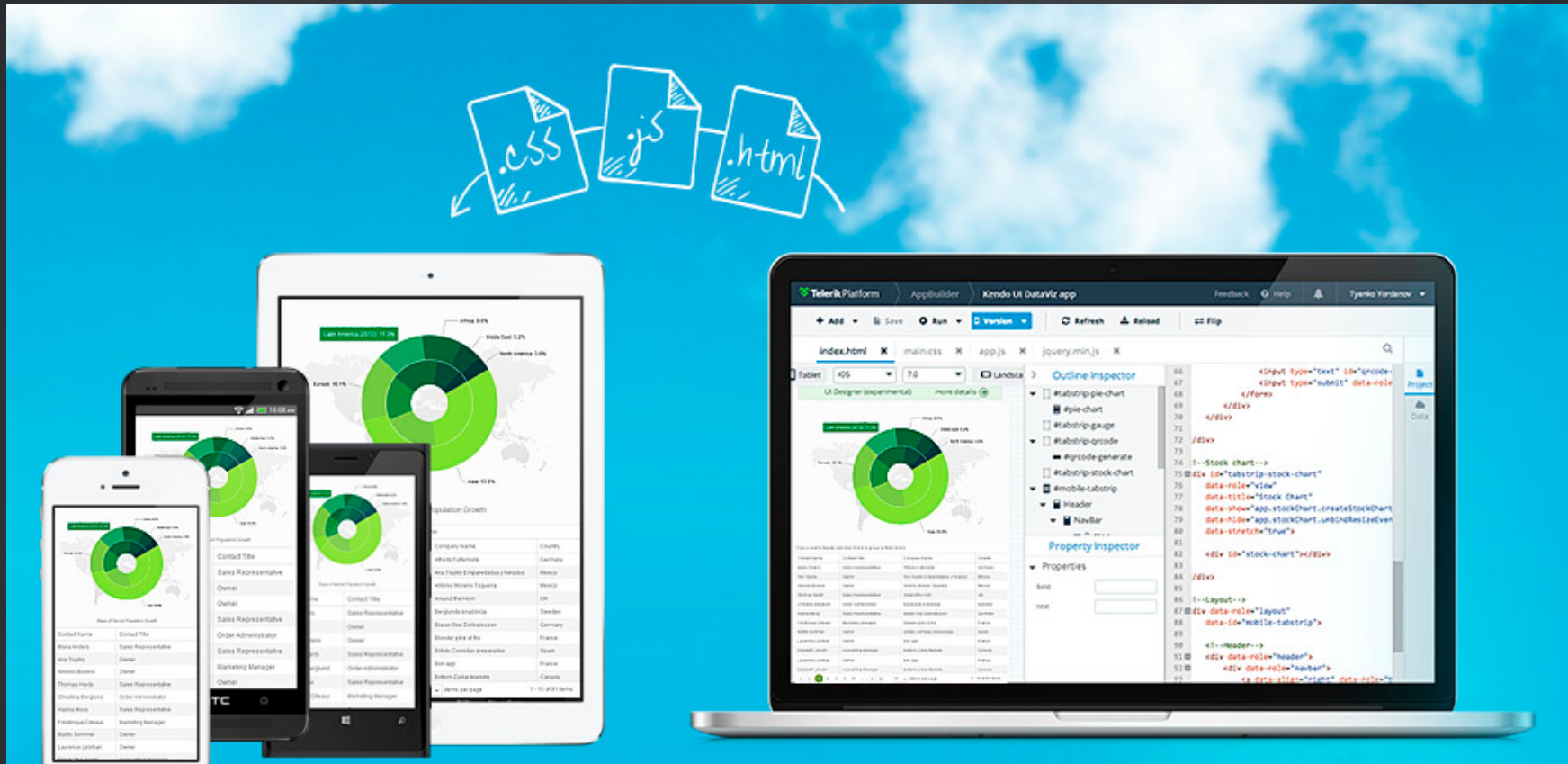
Telerik AppBuilder!

Telerik AppBuilder!

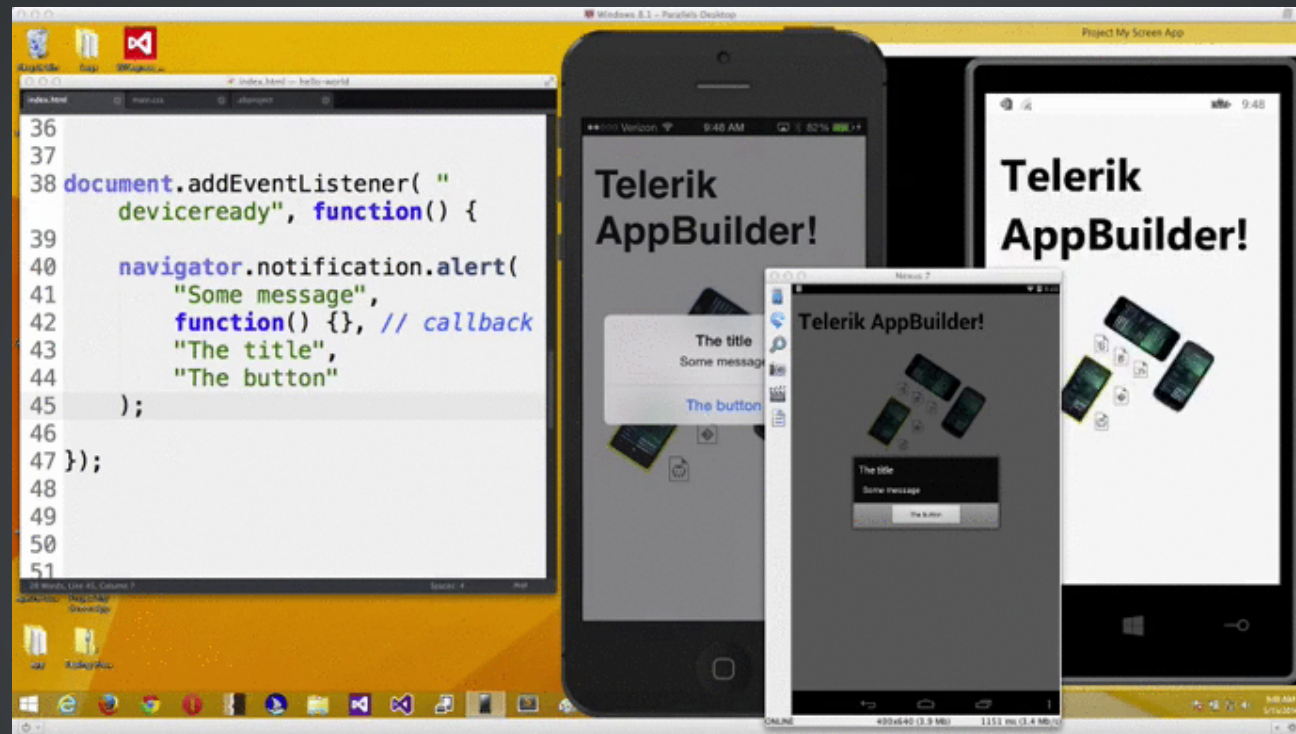
Tooling improvement #4: Cloud-Based Builds



LiveSync

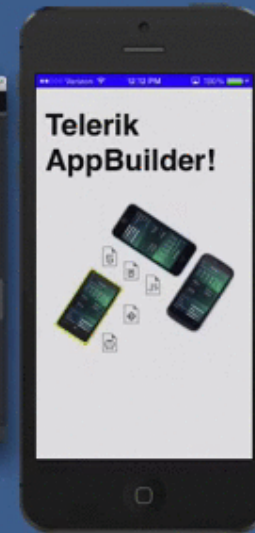


Demo



Demo

```
35  
36  
37  
38 document.addEventListener( "deviceready", function() {  
39  
40   StatusBar.hide()  
41  
42 });  
43  
44  
45
```



Tooling improvement #5: Backend Services

Storing a File

```
var el = new Everlive( /* API key */ );
el.Files.create(
  /* base 64 encoded file */,
  /* success callback */,
  /* error callback */
);
```


Finding the Right BaaS

<http://www.developereconomics.com/finding-right-baas/>

"we're tracking at least fifty BaaS offerings, and it seems more options appear nearly every month"

Performance



4GIFs.com

iOS Performance: The Bad News

The iOS 7 `UIWebView` incurs a 3.5x JavaScript performance penalty over the same app run in iOS Safari.

SunSpider

785.0ms vs. 3677.1ms — Safari is ~350% faster!

Verizon 11:19 AM 28%

webkit.org

SunSpider 1.0.1 JavaScript Benchmark Results

Content Version: sunspider-1.0.1

Run Again

To compare to another run, paste a saved result URL in the text field below and press enter:

RESULTS (means and 95% confidence intervals)

Total:	785.0ms +/- 5.5%
--------	------------------

3d:	123.8ms +/- 1.3%
cube:	43.9ms +/- 3.6%
morph:	35.4ms +/- 2.9%
raytrace:	44.5ms +/- 3.3%
access:	65.8ms +/- 3.4%
binary-trees:	9.7ms +/- 10.4%
fannkuch:	29.2ms +/- 3.0%
nbody:	17.3ms +/- 4.4%
nsieve:	9.6ms +/- 14.6%
bitops:	39.8ms +/- 3.9%
3bit-bits-in-byte:	2.9ms +/- 7.8%
bits-in-byte:	14.5ms +/- 7.4%
bitwise-and:	8.7ms +/- 7.8%
nsieve-bits:	13.7ms +/- 9.2%
controlflow:	10.6ms +/- 8.5%
recursive:	10.6ms +/- 8.5%
crypto:	64.7ms +/- 6.9%
aes:	30.7ms +/- 6.4%
md5:	19.7ms +/- 13.5%
sha1:	14.3ms +/- 12.7%
date:	92.8ms +/- 3.1%
format-tofte:	50.4ms +/- 4.3%
format-xparb:	42.4ms +/- 3.1%
math:	68.4ms +/- 6.5%
cordic:	15.7ms +/- 3.1%
partial-sums:	38.2ms +/- 10.8%
spectral-norm:	14.5ms +/- 3.5%
regexp:	39.8ms +/- 3.1%
dna:	39.8ms +/- 3.1%

Verizon 11:14 AM 26%

www.webkit.org/perf/su

SunSpider 1.0.1 JavaScript Benchmark Results

Content Version: sunspider-1.0.1

Run Again

To compare to another run, paste a saved result URL in the text field below and press enter:

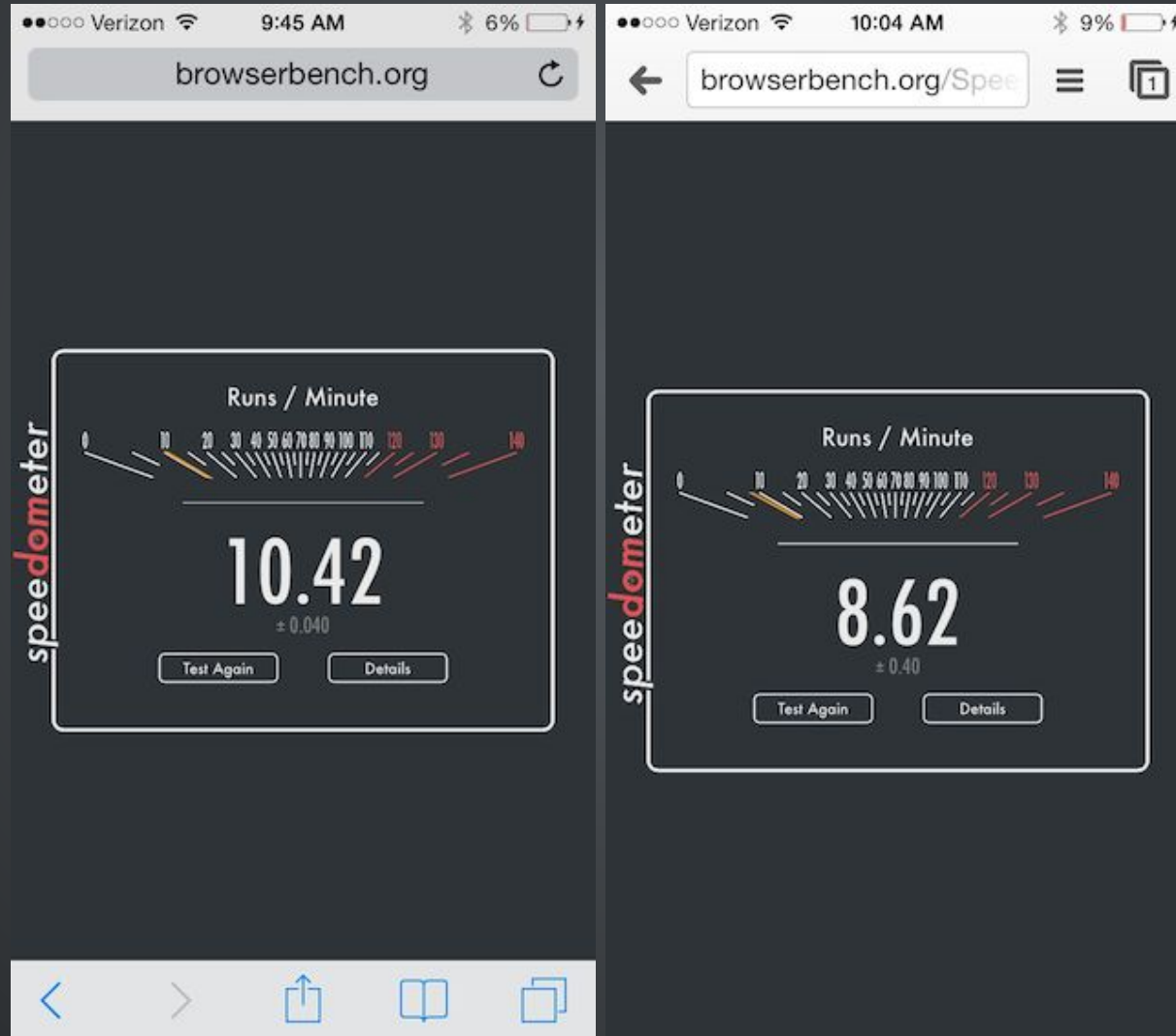
RESULTS (means and 95% confidence intervals)

Total:	3677.1ms +/- 0.4%
--------	-------------------

3d:	283.1ms +/- 0.4%
cube:	48.4ms +/- 0.9%
morph:	104.4ms +/- 0.5%
raytrace:	110.3ms +/- 0.9%
access:	373.7ms +/- 0.4%
binary-trees:	46.9ms +/- 1.8%
fannkuch:	208.3ms +/- 0.4%
nbody:	76.4ms +/- 1.4%
nsieve:	42.1ms +/- 3.2%
bitops:	466.6ms +/- 0.8%
3bit-bits-in-byte:	60.4ms +/- 1.0%
bits-in-byte:	91.8ms +/- 0.3%
bitwise-and:	192.6ms +/- 2.1%
nsieve-bits:	121.8ms +/- 0.5%
controlflow:	54.2ms +/- 1.0%
recursive:	54.2ms +/- 1.0%
crypto:	211.4ms +/- 0.7%
aes:	75.5ms +/- 0.8%
md5:	70.5ms +/- 1.5%
sha1:	65.4ms +/- 0.8%
date:	195.7ms +/- 1.6%
format-tofte:	93.4ms +/- 2.5%
format-xparb:	102.3ms +/- 1.4%
math:	358.1ms +/- 0.3%
cordic:	145.0ms +/- 0.3%
partial-sums:	135.9ms +/- 0.5%
spectral-norm:	77.2ms +/- 0.4%
regexp:	1059.6ms +/- 0.8%
dna:	1059.6ms +/- 0.8%
string:	674.7ms +/- 0.9%
base64:	105.6ms +/- 0.8%
fasta:	116.2ms +/- 0.9%
tagcloud:	180.7ms +/- 3.3%
unpack-code:	188.1ms +/- 1.0%
validate-input:	84.1ms +/- 1.3%

Speedometer

Safari is ~20% faster.



OMG WKWebView! OMG! OMG!

9to5Mac
APPLE INTELLIGENCE

MAC IOS AAPL BUYING GUIDES REVIEWS APPS COMMU

There are 21 comments; join the conversation!

Daily Deals

iOS 8 WebKit changes finally allow all apps to have the same performance as Safari



<http://9to5mac.com/2014/06/03/ios-8-webkit-changes-finally-allow-all-apps-to-have-the-same-performance-as-safari/>

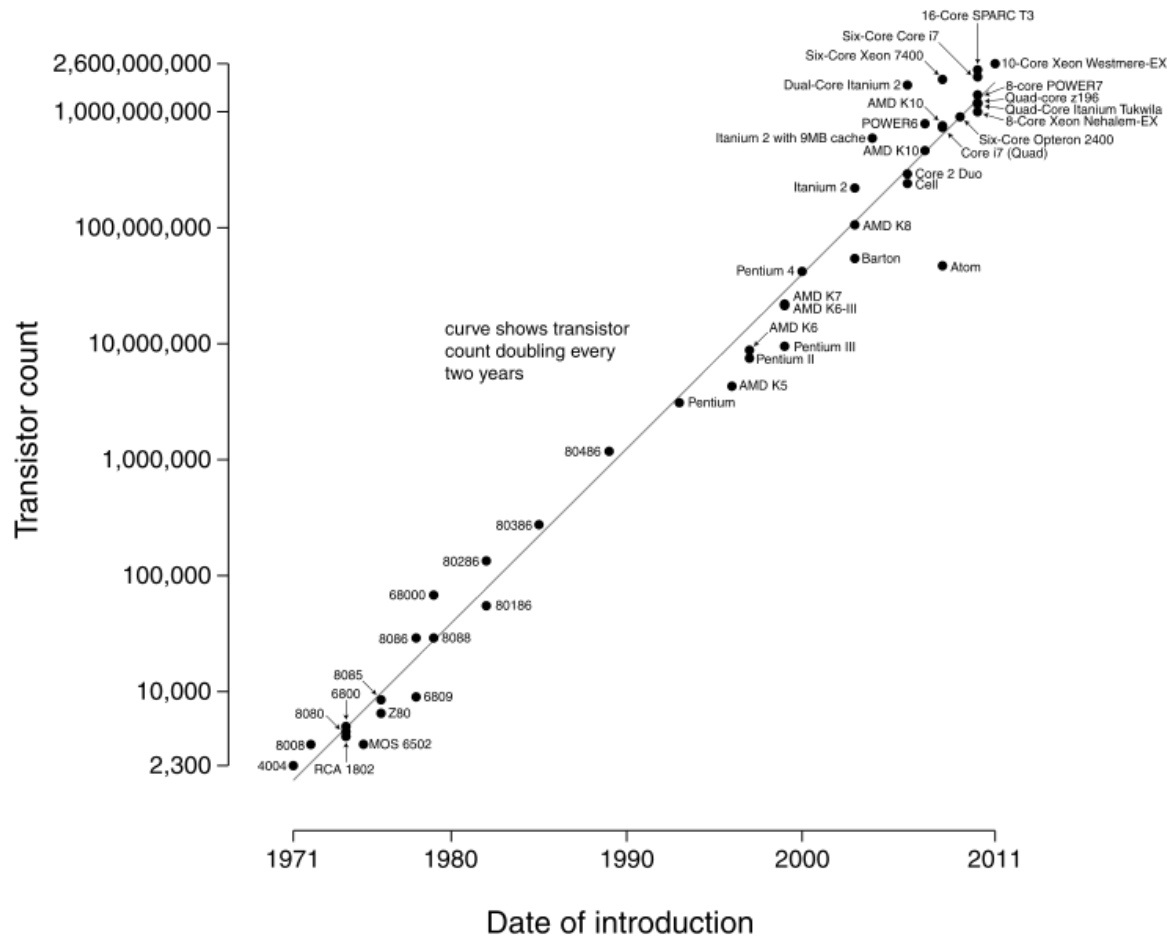
Performance on Android

Android 4.4 switched to a new Chromium-based WebView.



Moore's Law

Microprocessor Transistor Counts 1971-2011 & Moore's Law

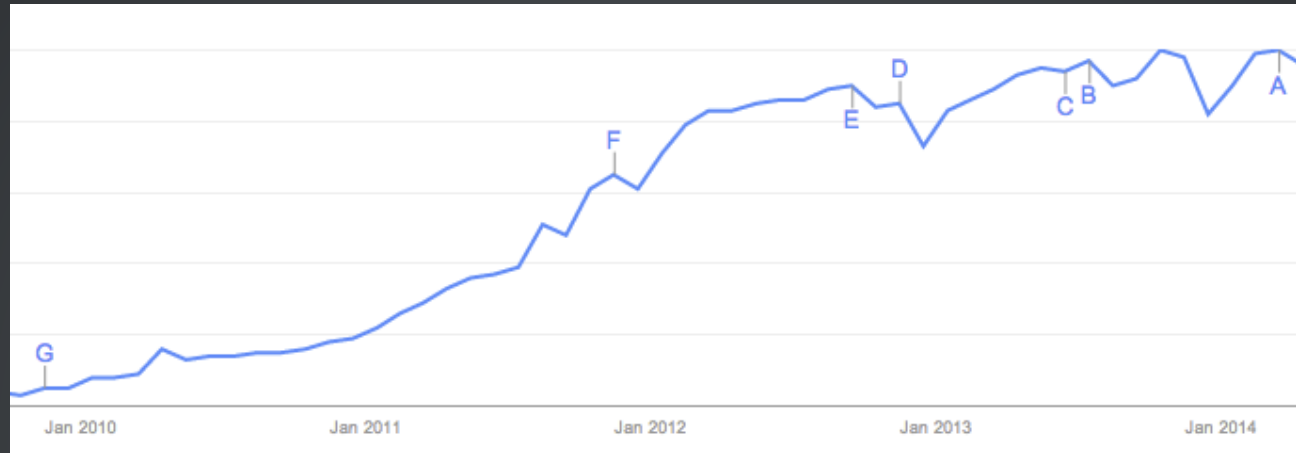


The performance of hybrid application will never be on par with native applications, but as speeds improve, hybrid becomes “good enough” for an increasing number of applications.

The future

Is the hybrid development growing or shrinking?

trends.google.com: PhoneGap



What is hybrid?

Cross-Compile Solutions



Products ▾

Customers

Pricing

Developers

Support ▾

Create native iOS, Android,
Mac and Windows apps in C#.

Titanium Mobile Development Environment

Create bold, beautiful and
transformative mobile experiences



Mix and match?

Best Of Both Worlds: Mixing HTML5 And Native Code

By [Peter Traeg](#)

 October 17th, 2013

 [Android, HTML5, Opinion Column](#)

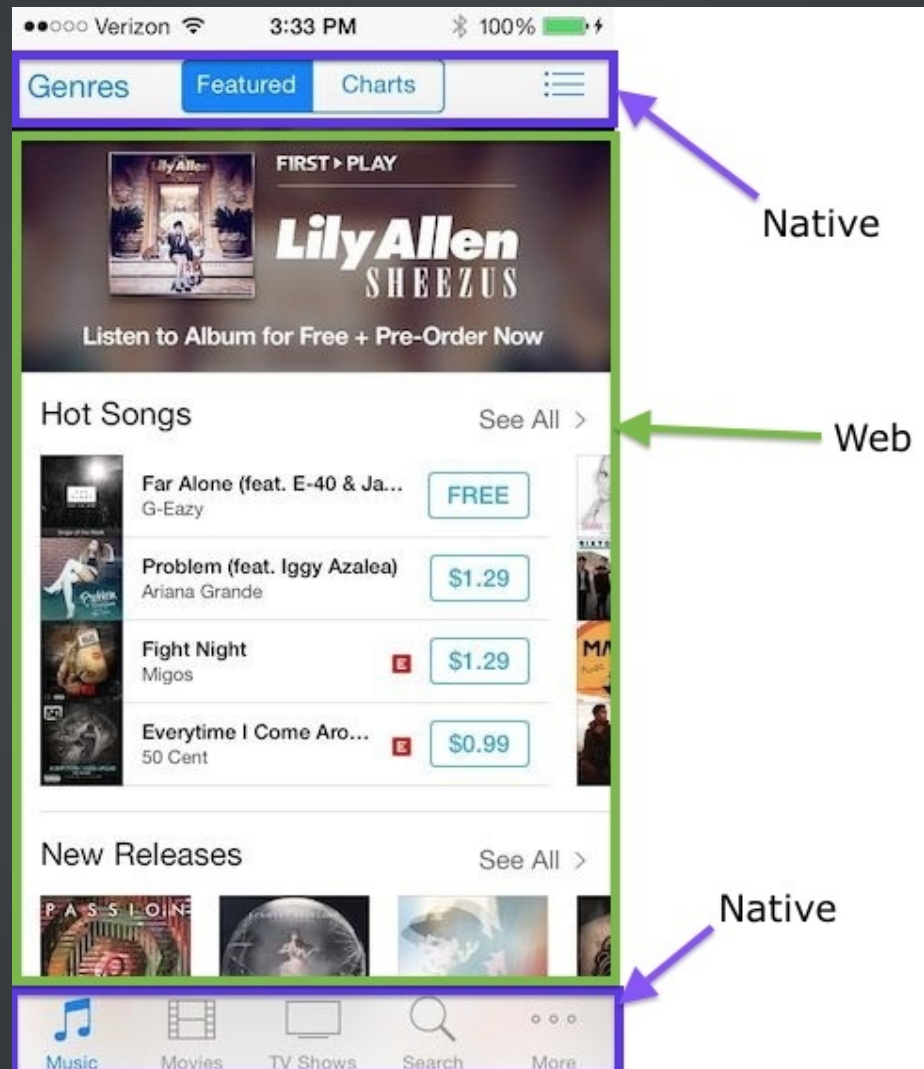
 26 Comments

Much has been written recently in the ongoing debate between native and HTML5 applications. There are three principal ways to develop a mobile solution:

- native code,
- hybrid mobile app,
- mobile Web app.

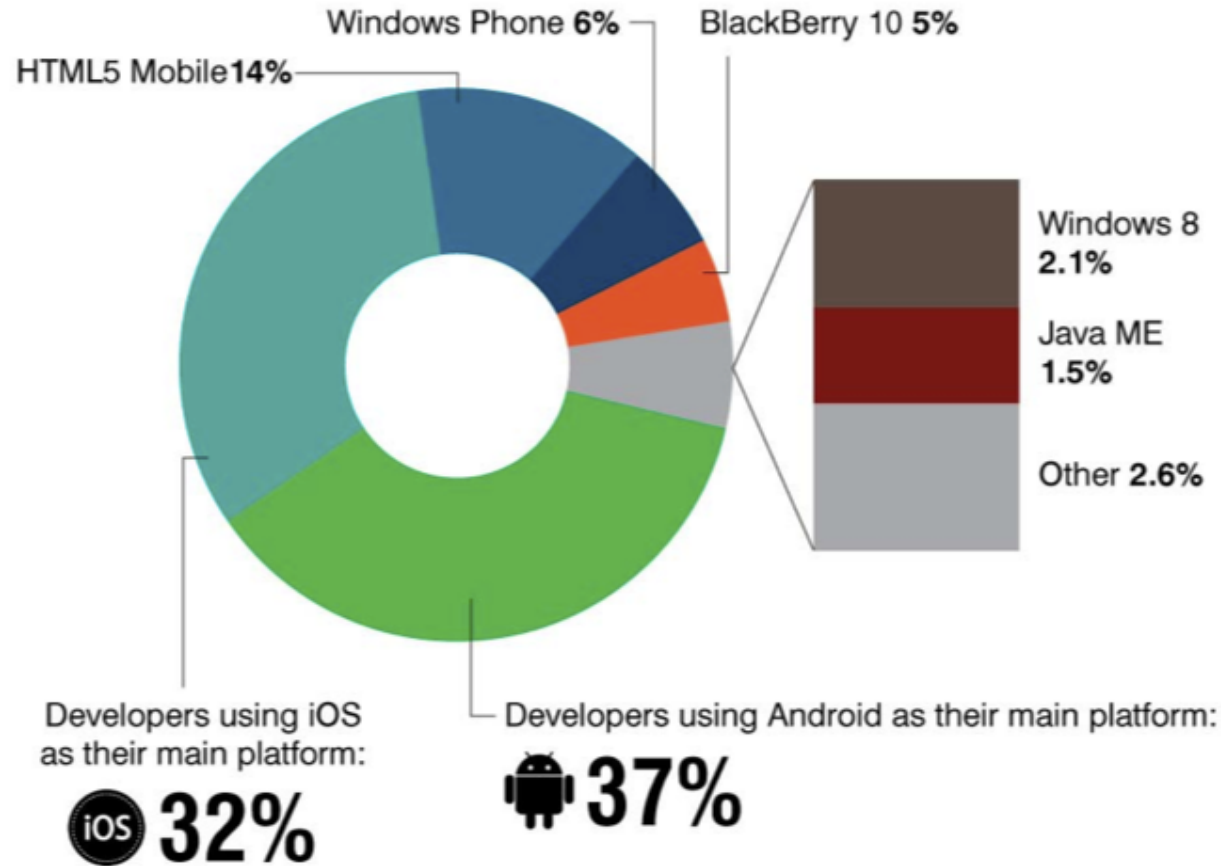
<http://mobile.smashingmagazine.com/2013/10/17/best-of-both-worlds-mixing-html5-native-code/>

iTunes



DEVELOPER LOYALTY SPLIT BETWEEN IOS & ANDROID

% of developers using each platform as their main platform (n=6,311)



Thanks

TJ VanToll | [@tjvantoll](#) | [tjvantoll.com](#)

- jQuery UI in Action
- [manning.com/vantoll](#)
- 45% off with code qcon14bf!