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# Playing fair with the **Network**

Developing Smarter Apps for optimising network resources



**Made after complaints to Network Operators**  
Complaints about bad performance and connectivity

# What about **Web Apps**?

The web is **awesome**!

- Always up-to-date
- Build once, deploy everywhere
- Cloud based data



But web app **performance** is always lagging behind native.  
New **HTML5 features** can help!

# What we will look at:

- Resource APIs
- Network Information APIs
- Detecting browser compatibility
- Managing Images





## Resource APIs

# Battery Status API

Example: ~~Firefox OS Simulator~~ **Firefox OS Simulator** charging

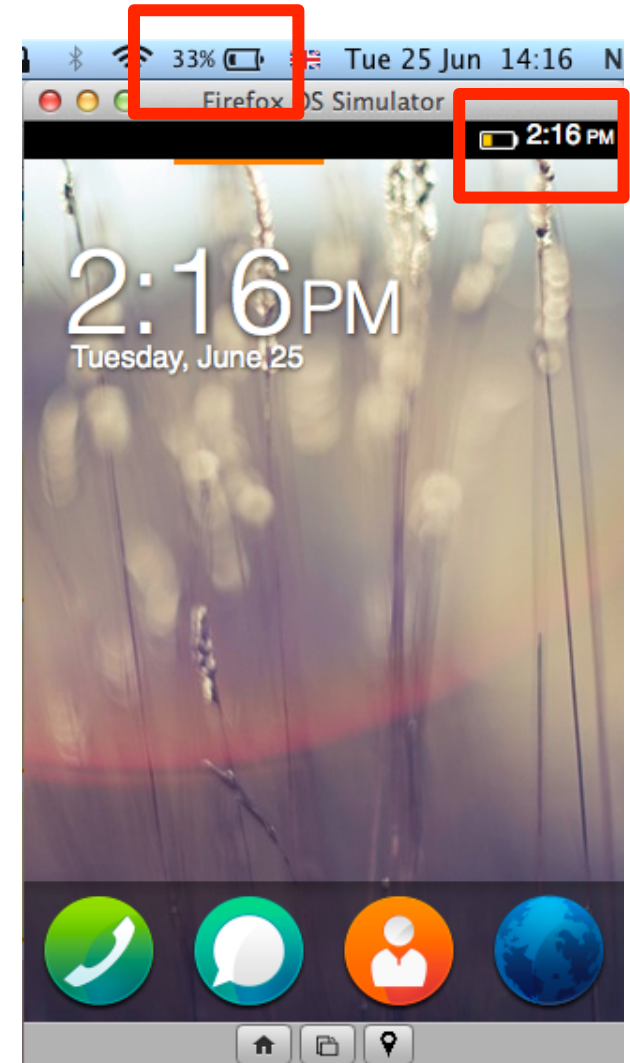
[https://developer.mozilla.org/en-US/docs/Tools/States whether the system's battery is charging.](https://developer.mozilla.org/en-US/docs/Tools/States%20whether%20the%20system's%20battery%20is%20charging)  
Firefox\_OS\_Simulator

`navigator.battery.chargingTime`

Get time remaining in seconds until the battery is fully charged.

`navigator.battery.dischargingTime`

Get amount of time in seconds left until the battery is drained and the system (device) is suspended.





## Resource APIs

### Ambient Light API

`DeviceLightEvent`

Get info about ambient light near device

### Task Scheduler API

`navigator.taskScheduler`

Schedule tasks such as alarm and calendar

### Proximity Sensors API

`DeviceProximityEvent`

Gets info on about the distance between the device and a nearby object



## Network Info APIs

# Network Information API

`navigator.connection`

The **first try** at this told us very little.

`navigator.connection.bandwidth`

**Better!** Gets estimation of the current bandwidth in megabytes per second

`navigator.connection.metered`

Created to indicate whether a user is on a pre-pay or capped data plan.

`navigator.connection.onchange`

[Event] Fired if connection object changes, separate “online” and “offline” events exist.

— Attributes — Events



## Network Info APIs

# Network Interface API

**Proposed spec!** What would we like to see?

- Strength of network
- Listening available networks
- Configuring network use

**Statistics**

**Manipulation**



# Feature Detection

How do we know if the browser supports new features?

# Feature Detection

## ① Resources

- CanIUse.com
- MobileHTML5.org

**MOBILE HTML**

Trying to understand HTML5 compatibility on mobile and tablet browsers

Feature	Safari on iOS	Android Browser	Google Chrome	Amazon Silk	BlackBerry Browser	Nokia Browser	Internet Explorer	Opera Mobile	Opera mini	Firefox	webOS Browser
Platform	iPhone, iPad	Phones & Tablet	Android 4.0+	Kindle Fire	Phones, Tablet	Nokia N9, Symbian	Windows Phone 7.5, Windows 8	Android & Symbian	Java, iOS, Android	Android, Meego	HP Phones, HP TouchPad
Versions tested	3.2 to 6.1	1.5 to 4.2	18 to 25b	1.0 to 2.0	5.0 to 7.1, 9810	1.0 to 2.1	1.2, 10 to Belle FP2	9, 10 (metro)	11 to 12.1	5 to 7, 8 to 18	1.4 to 2.0, 3.0
Application Cache	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Web storage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Web SQL storage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Geolocation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Multimedia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Server-Sent Events	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Always use feature detection.  
More info: [blog](#) & [books](#)  
If you want to help or send feedback, [contact me](#).  
by [fd](#) | [Updates on Twitter](#) | [Blog](#)

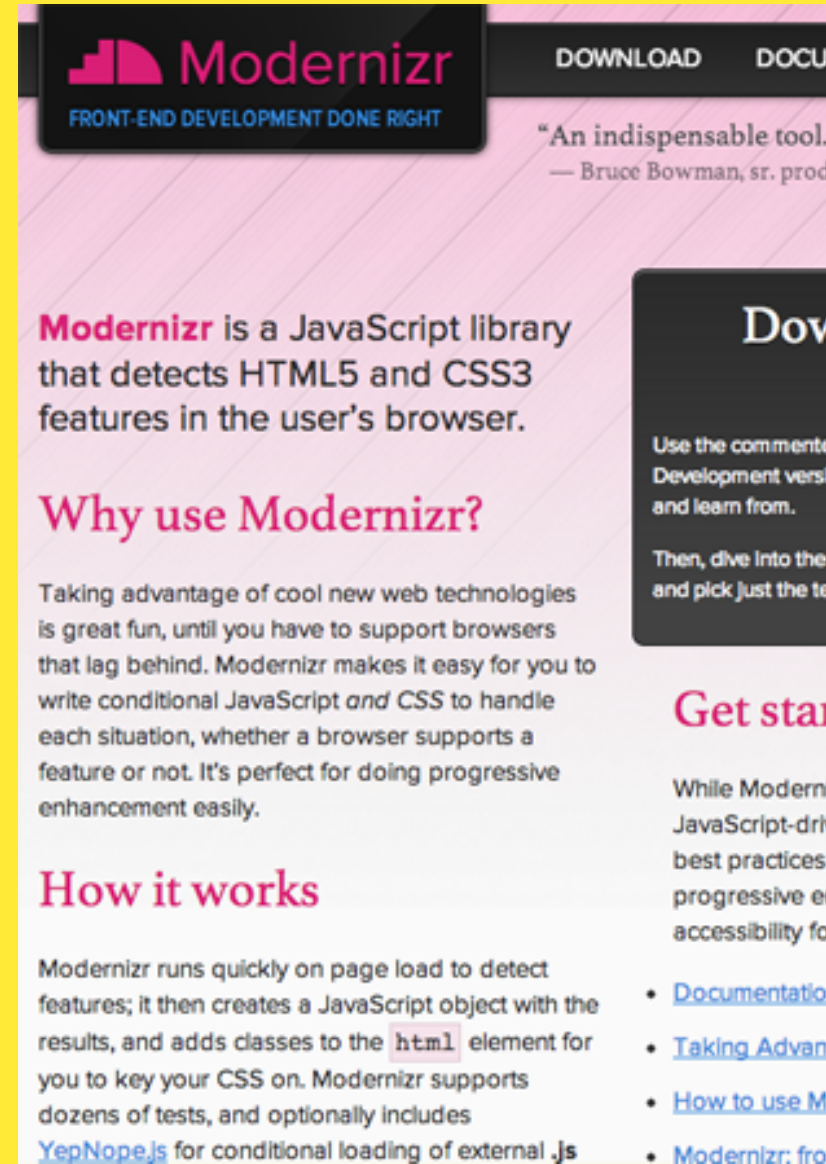
5,831 2.9k  
This widget is available on Twitter, Facebook, and Google+.

Follow me @fd

# Feature Detection

## ② Modernizr

- Creates JavaScript object
- Adds classes to <html>



The image is a screenshot of the Modernizr website. At the top, there's a dark header with the Modernizr logo (a pink square with a white 'M' shape) and the text 'Modernizr' in pink. Below the logo, it says 'FRONT-END DEVELOPMENT DONE RIGHT' in blue. To the right of the logo, there are links for 'DOWNLOAD' and 'DOCUMENTATION'. Below the header, there's a quote: 'An indispensable tool.' — Bruce Bowman, sr. product manager. The main content area has a pink background with diagonal lines. It features a section titled 'Modernizr is a JavaScript library that detects HTML5 and CSS3 features in the user's browser.' followed by a section 'Why use Modernizr?' which explains that Modernizr makes it easy to write conditional JavaScript and CSS to handle different browser capabilities. Below that is a section 'How it works' which describes how Modernizr runs on page load to detect features and adds classes to the <html> element. On the right side, there's a dark sidebar with the text 'Dow...' and 'Use the commented Development version and learn from. Then, dive into the and pick just the te'. At the bottom right, there's a section 'Get started' which includes a list of links: 'Documentation', 'Taking Advan...', 'How to use M...', and 'Modernizr: fro...'. The footer of the website is not visible in the screenshot.

**Modernizr**  
FRONT-END DEVELOPMENT DONE RIGHT

DOWNLOAD DOCUMENTATION

"An indispensable tool."  
— Bruce Bowman, sr. product manager

**Modernizr** is a JavaScript library that detects HTML5 and CSS3 features in the user's browser.

**Why use Modernizr?**

Taking advantage of cool new web technologies is great fun, until you have to support browsers that lag behind. Modernizr makes it easy for you to write conditional JavaScript and CSS to handle each situation, whether a browser supports a feature or not. It's perfect for doing progressive enhancement easily.

**How it works**

Modernizr runs quickly on page load to detect features; it then creates a JavaScript object with the results, and adds classes to the `<html>` element for you to key your CSS on. Modernizr supports dozens of tests, and optionally includes [YepNope.js](#) for conditional loading of external .js

**Get started**

- [Documentation](#)
- [Taking Advan...](#)
- [How to use M...](#)
- [Modernizr: fro...](#)

## Feature Detection

### ③ Ask the Browser!



- Is an HTML attribute created?
- Was a CSS style applied?
- Does this JavaScript API exist?

```
// test for audio
return !!document.createElement('audio').canPlayType;

// test for geolocation
function supports_geolocation() {
  return 'geolocation' in navigator;
}
```

## Feature Detection

# ④ User Agent Sniffing

```
(function(a,b){if(/(android|bb\d+|meego).+mobile|avantgo|bada\/|blackberry|blazer|compal|elaine|fennec|hiptop|iemoible|ip(hone|od)|iris|kindle|lge |maemo|midp|mmp|netfront|opera m(ob|in)i|palm( os)?|phone|p(ixi|re)\\/|plucker|pocket|psp|series(4|6)0|symbian|treo|up\.(browser|link)|vodafone|wap|windows (ce|phone)|xda|xiino/i.test(a)||/1207|6310|6590|3gso|4thp|50[1-6]|i[770s|802s|a wa|abac|ac(er|oo|s\-)|ai(ko|rn)|al(av|ca|co)|amoi|an(ex|ny|yw)|aptu|ar(ch|go)|as(te|us)|attw|au(di|\-m|r |s )|avan|be(ck|ll|nq)|bi(lb|rd)|bl(ac|az)|br(e|v)w|bumb|bw\-(n|u)|c55\/|capi|ccwa|cdm\-|cell|chtm|cldc|cmd\-|co(mp|nd)|craw|da(it|ll|ng)|dbte|dc\-s|devi|dica|dmob|do(c|p)o|ds(12|\-d)|el(49|ai)|em(12|ul)|er(ic|k0)|esl8|ez([4-7]0|os|wa|ze)|fetc|fly(\-|_)|g1 u|g560|gene|gf\-5|g\-mo|go(\.w|od)|gr(ad|un)|haie|hcit|hd\-(m|p|t)|hei\-|hi(pt|ta)|hp( i|ip)|hs\-c|ht(c(\-| _|a|g|p|s|t)|tp)|hu(aw|tc)|i\-(20|go|ma)|i230|iac( |\-|\/)|ibro|idea|ig01|ikom|im1k|inno|ipaq|iris|ja(t|v)a|jbro|jemu|jigs|kddi|keji|kgt( |\-|\/)|klon|kpt |kwc\-|kyo(c|k)|le(no|xi)|lg( g|\/(k|l|u)|50|54|\-[a-w]))|libw|lynx|m1\-w|m3ga|m50\/|ma(te|ui|xo)|mc(01|21|ca)|m\-cr|me(rc|ri)|mi(o8|oa|ts)|mmef|mo(01|02|bi|de|do|t(\-| |o|v)|zz)|mt(50|p1|v )|mwbp|mywa|n10[0-2]|n20[2-3]|n30(0|2)|n50(0|2|5)|n7(0(0|1)|10)|ne((c|m)\-|on|tf|wf|wg|wt)|nok(6|i)|nzph|o2im|op(ti|wv)|oran|owg1|p800|pan(a|d|t)|pdxg|pg(13|\-([1-8]|c))|phil|pire|pl(ay|uc)|pn\-2|po(ck|rt|se)|prox|psio|pt\-g|qa\-a|qc(07|12|21|32|60|\-[2-7]|i\-)|qtek|r380|r600|raks|rim9|ro(ve|zo)|s55\/|sa(ge|ma|mm|ms|ny|va)|sc(01|h\-|oo|p\-)|sdk\/|se(c(\-|0|1)|47|mc|nd|ri)|sgh\-|shar|sie(\-|m)|sk\-0|sl(45|id)|sm(al|ar|b3|it|t5)|so(ft|ny)|sp(01|h\-|v\-|v )|sy(01|mb)|t2(18|50)|t6(00|10|18)|ta(gt|lk)|tcl\-|tdg\-|tel(i|m)|tim\-|t\-mo|to(pl|sh)|ts(70|m\-|m3|m5)|tx\-9|up(\.b|g1|si)|utst|v400|v750|veri|vi(rg|te)|vk(40|5[0-3]|\-v)|vm40|voda|vulc|vx(52|53|60|61|70|80|81|83|85|98)|w3c(\-| )|webc|whit|wi(g |nc|nw)|wmlb|wonu|x700|yas\-|your|zeto|zte \- /i.test(a.substr(0,4)))window.location=b}})(navigator.userAgent||navigator.vendor||window.opera,'http://detectmobilebrowser.com/mobile');
```

## Feature Detection

### ⑤ @supports

- New CSS element
- If CSS element is supported by browser then implement CSS in block

```
@supports (
  (perspective: 10px) or
  (-moz-perspective: 10px) or
  (-webkit-perspective: 10px) or
  (-ms-perspective: 10px) or
  (-o-perspective: 10px) ) {
  /* specific CSS applied when 3D transforms,
  eventually prefixed, are supported */
}
```

Source: [MDN](#)

# What about Images?

Images account for **69% of the page bytes** being delivered to mobile over the web!

- **Lossy** / **Lossless**
- Know your **formats**!
- **Lazy** Loading / **LIQP**
- **Responsive** Images

PNG



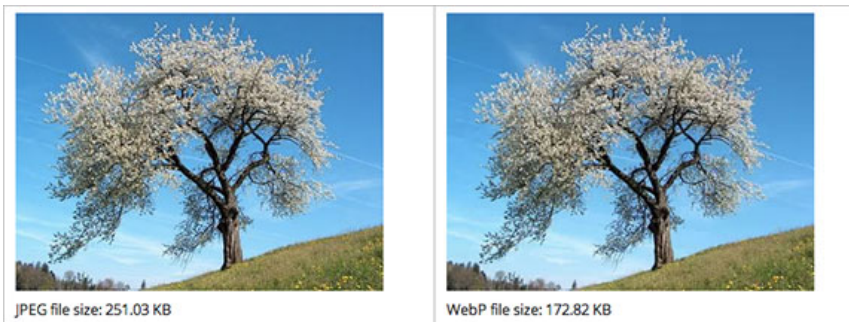
GIF



JPEG



WebP



# What did we learn?

- The web is **great**!
- **Performance** issues
- New **HTML5 APIs** can help!
- While waiting, let's be clever about **feature detection**
- And understand **images**!



# Smarter Apps Guidelines

<http://www.gsma.com/technicalprojects/smarter-applications>

- For more guidelines including:

**Compression**

**Security**

**Image Formats**

**User Experience**

**Offline**

**Scheduling**

**Error Handling**

**Caching**

**iOS**


**Android**

**Windows**

**Web**

Please help us grow the Smarter Apps Guidelines by **registering and adding new content!**

[gsma.com/technicalprojects/smarter-applications](http://gsma.com/technicalprojects/smarter-applications)




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# Smarter apps guidelines

**SMART. SECURE. EFFICIENT**  
**YOUR GUIDE TO BUILDING BETTER MOBILE APPS**


This site is worked on at high speed and will be publicly available in the short term. Please come back again.




General development principles

LATEST UPDATES   
General Principles


iOS apps

LATEST UPDATES  <>  
Scheduling

Building Android apps

LATEST UPDATES  <>

[gsma.com/technicalprojects/smarter-applications](http://gsma.com/technicalprojects/smarter-applications)



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# Smarter apps guidelines

Home

## Building **Android** apps

Best practice development documentation

Android

General	 <h3>Asynchrony in Android</h3> <p>Implementation methods including throttling</p>	 <h3>Offline Mode</h3> <p>Maintaining smooth user experience in offline situations</p>	 <h3>Caching for Android</h3> <p>Using <code>CachingHttpClient</code> and Java's Response Cache mechanisms</p>
iOS			
Android	 <h3>Security</h3> <p>Utilising the <code>java.security</code> package to support security</p>	 <h3>Push Notifications</h3> <p>Working with Google Cloud Messaging (GCM)</p>	 <h3>Data Formats</h3> <p>Working with XML and JSON in Android</p>
Windows			

[gsma.com/technicalprojects/smarter-applications](http://gsma.com/technicalprojects/smarter-applications)



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« [Asynchrony In Android](#)



[Offline Mode](#)



**[Caching For Android](#)**



[Security](#)



[Push Notifications](#)



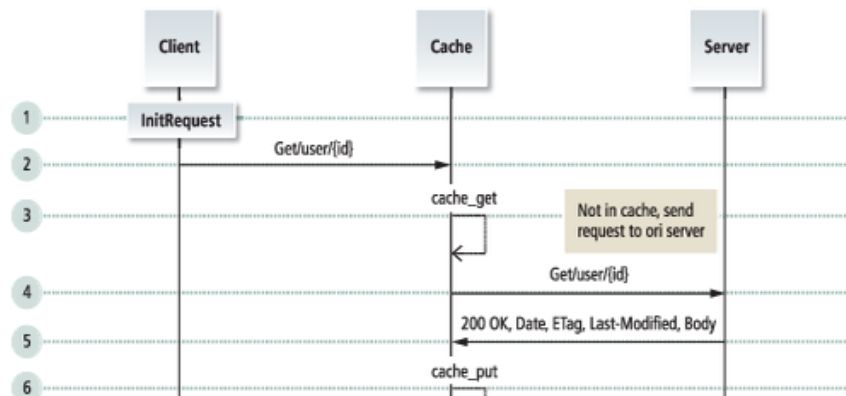
[Data Formats](#) »

### ANDROID

## Caching For Android



Android's browser makes use of internal APIs to support HTTP caching. These APIs are not available to other applications and so extra effort is needed if caching is to be supported. According to RFC-2616, a possible sequence diagram could be as in Figure 16 on the following page:



### Related Links

[General guidelines](#)  
[iOS](#)  
[Windows](#)  
[Web](#)

General

iOS

Android

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# Thank-you!

## Playing fair with the Network

Developing Smarter Apps for optimising network resources