

Roma
20-23.03.2013

www.codemotionworld.com

{codemotion}

Mobile Meow: Bringing Videos to a Mobile World

Greg Schechter - Web Warrior, Facebook

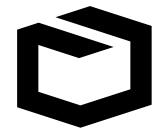
#mov06 <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Greg Schechter The Web Warrior



schechter@fb.com

<http://www.w3.org/html/logo/>



Graphics



Connectivity



CSS3 Styling



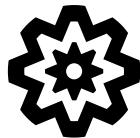
Device Access



Multimedia



Offline and Storage



Performance and Integration



Semantics

Multimedia

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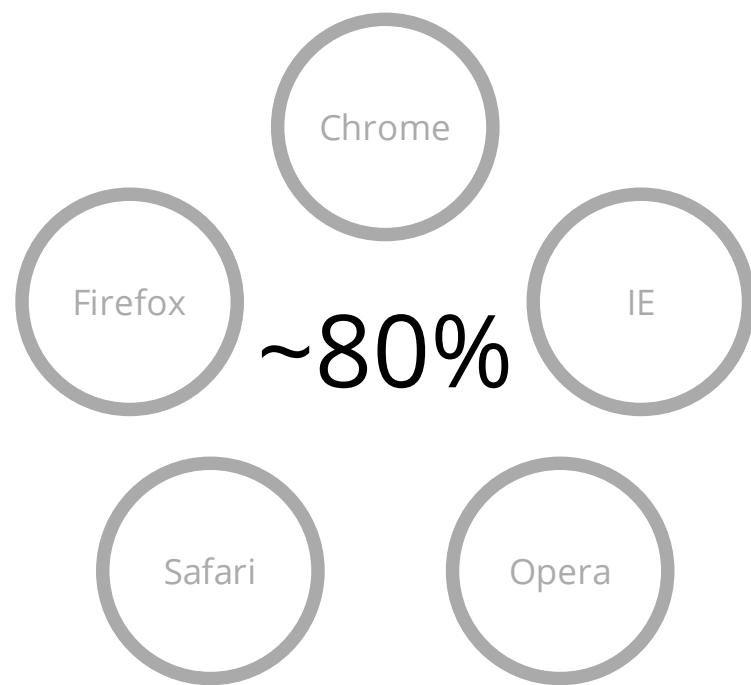
<http://www.flickr.com/photos/dannykboyd/5048495262/>

<video>

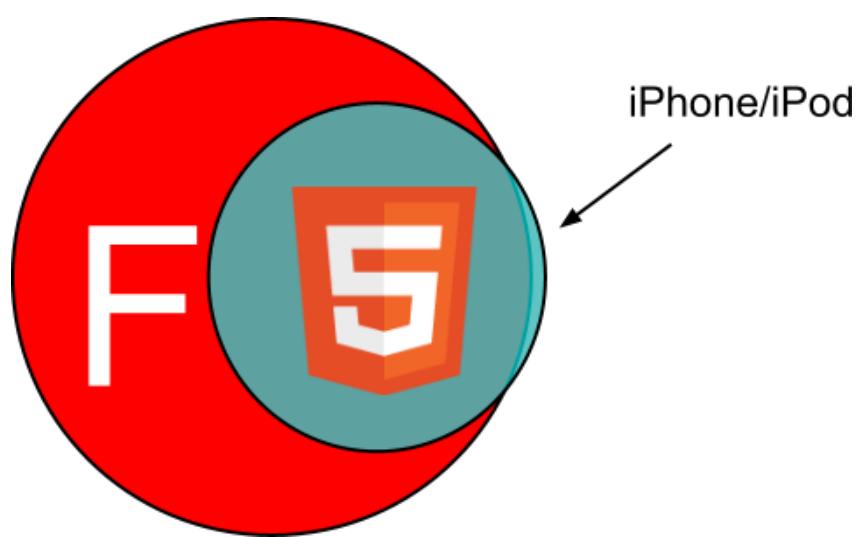
<video> expectations

- Open source technology
 - Browser / Player / Codec
- Lower latency
 - No plug-in instantiation
- Better performance and fidelity
- Accessibility
- Power Consumption*

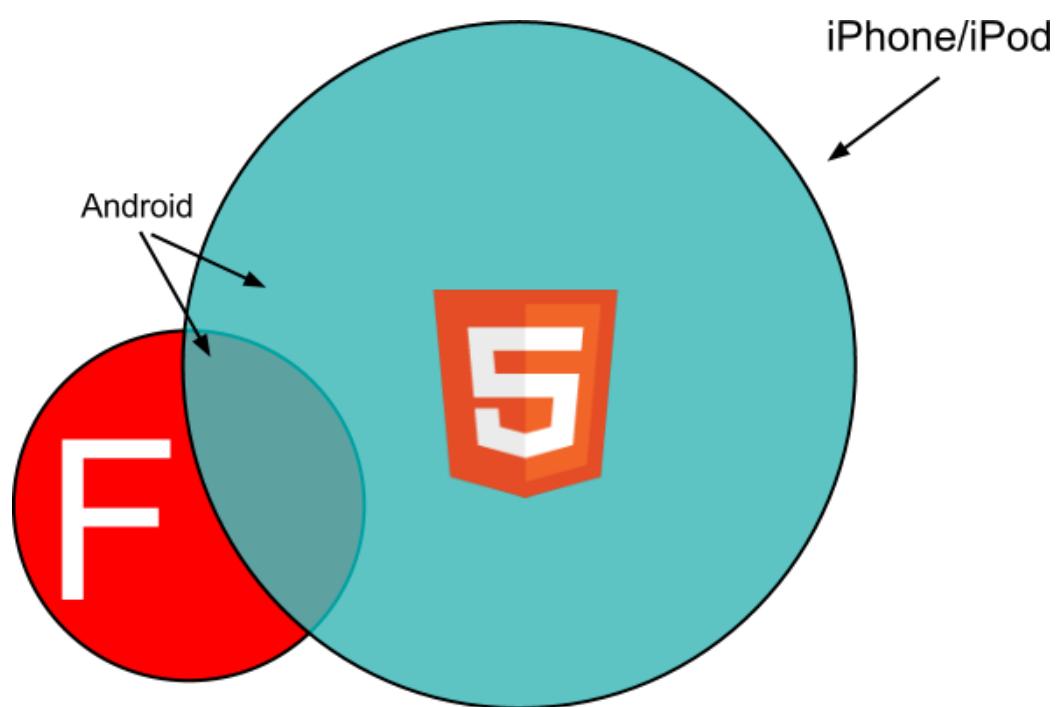
HTML5 Video Capable Browsers



Flash Support vs. HTML5 Support



YouTube Data API Usage for Flash vs. HTML5 Devices



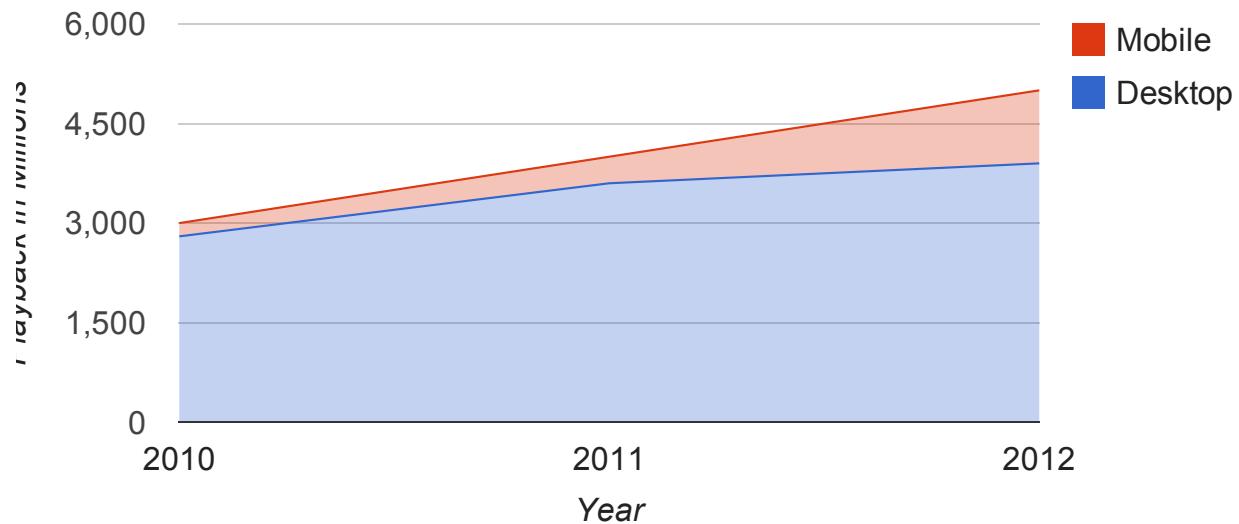
Let's talk mobile

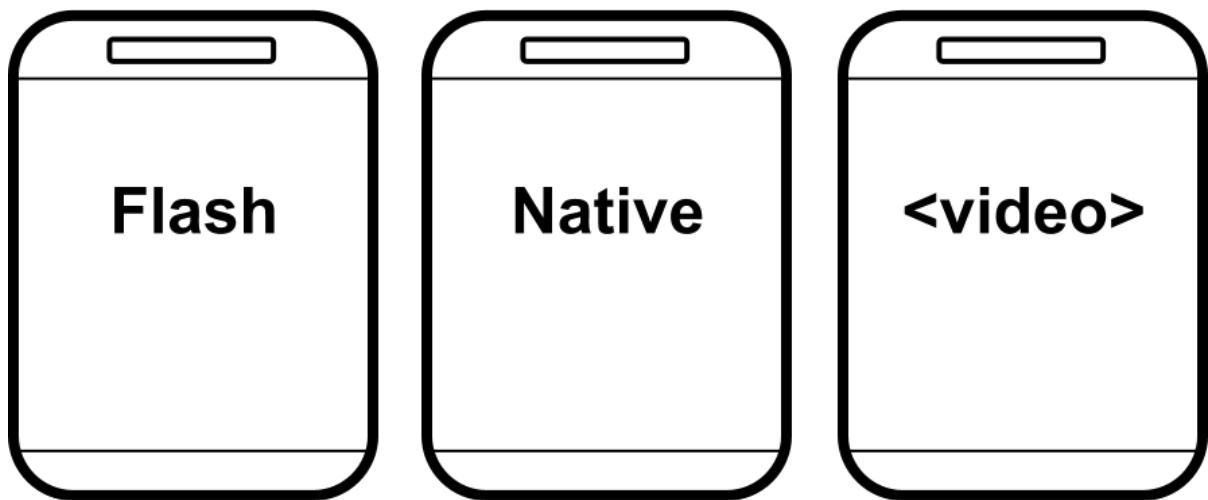
<http://www.flickr.com/photos/indi/2579412663/>

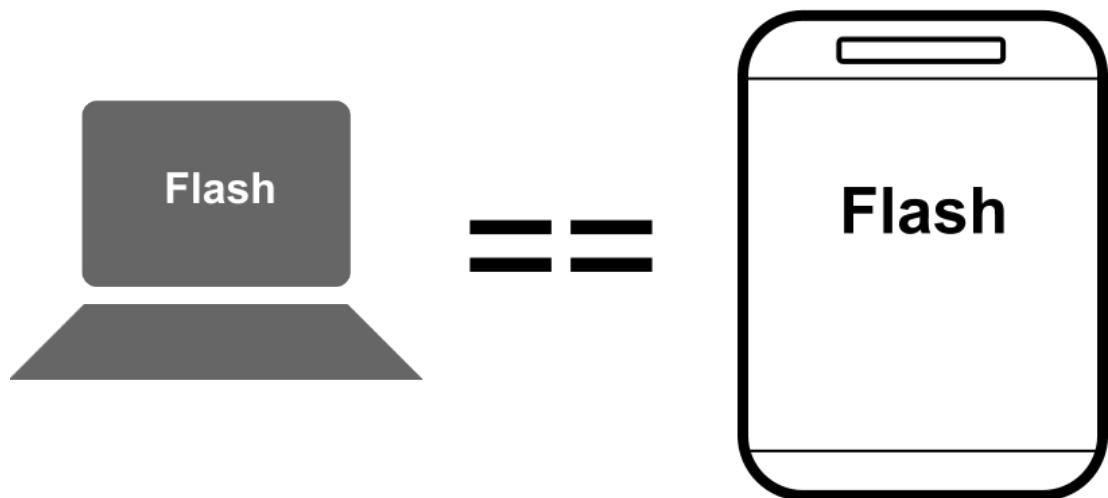
Why is Mobile Important

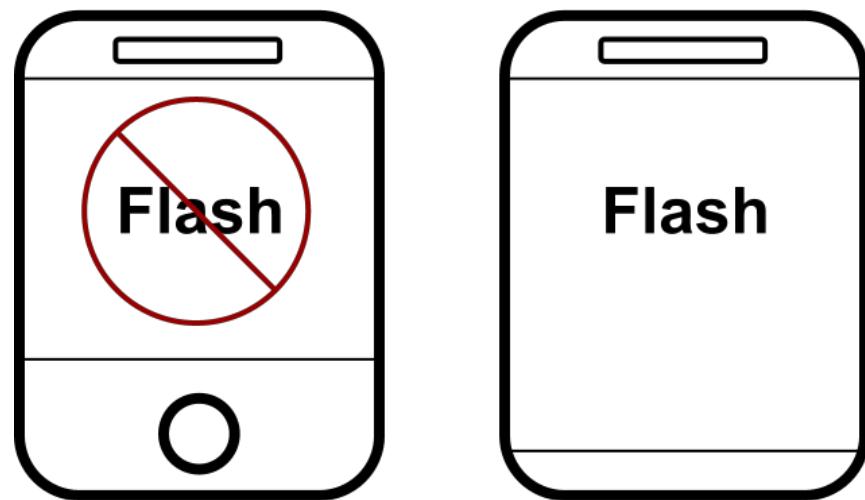
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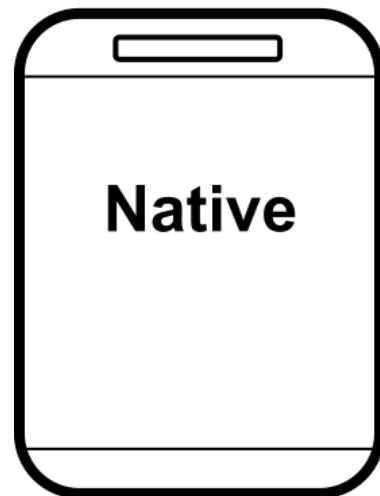
Playback Stats





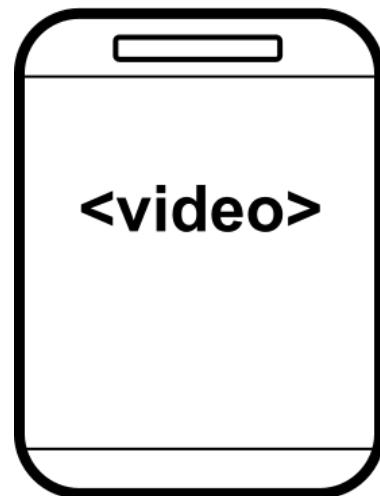




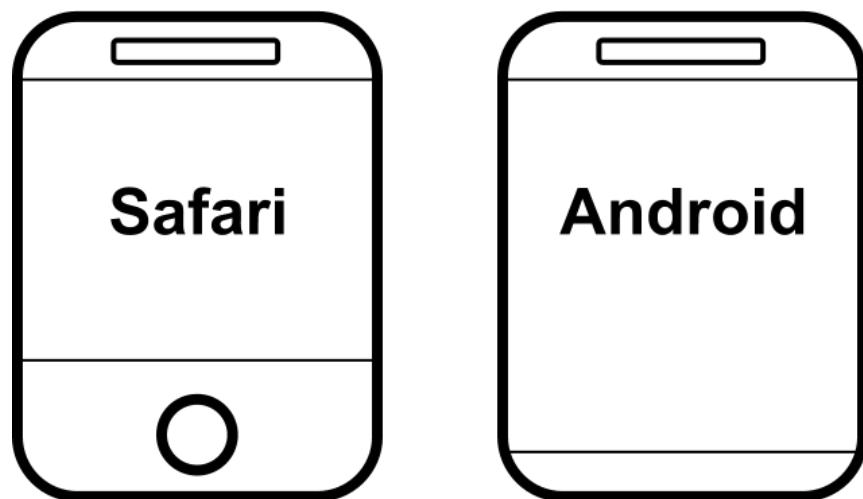


Native

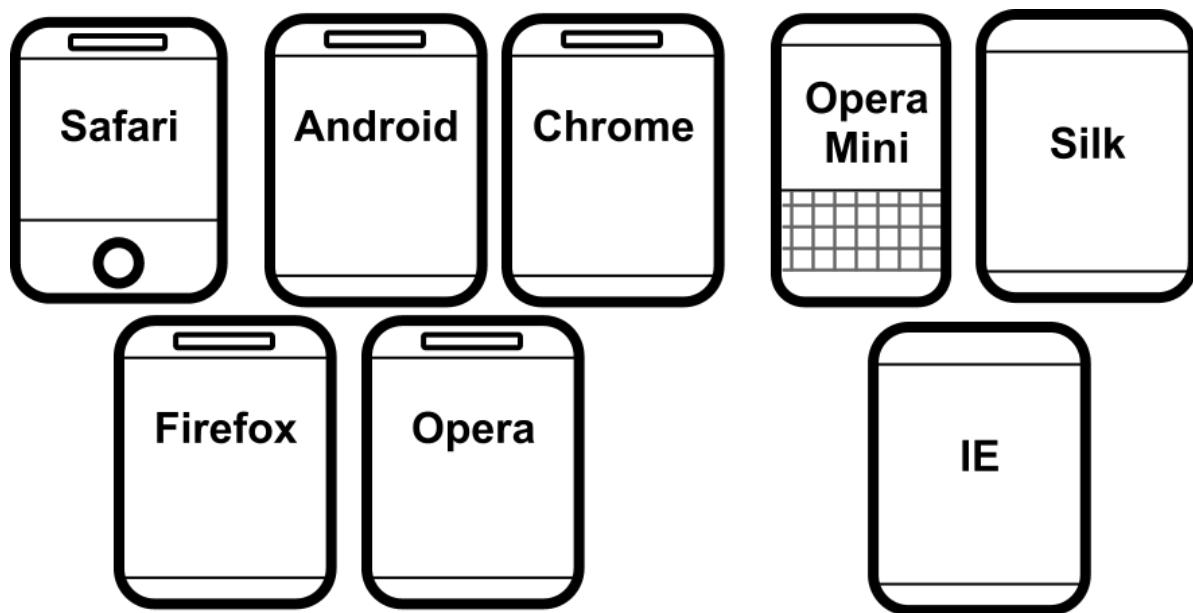
- For fallbacks, use rtsp:// protocol (serving .3gp) if the device won't support HTML5
- Use custom protocol / URL scheme to launch the native app (on Android / BB: vnd.youtube:video_id)
- iOS special-cases the YouTube Flash embed code



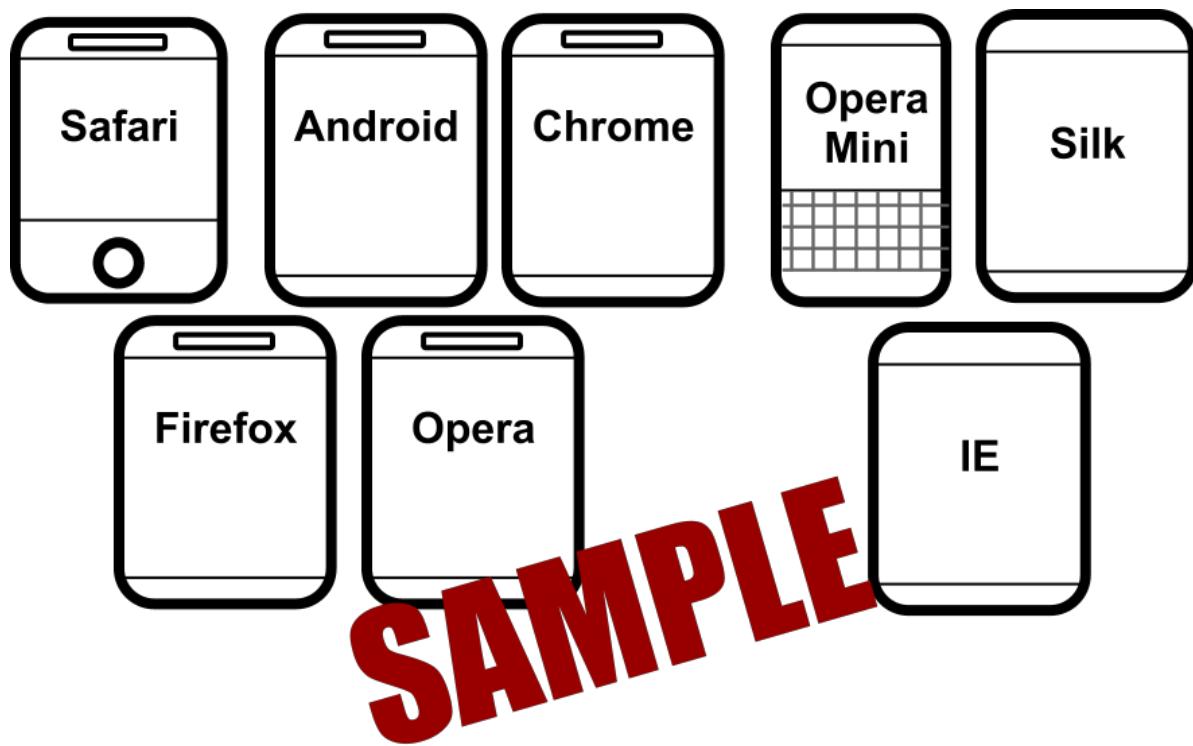
The Different Browsers

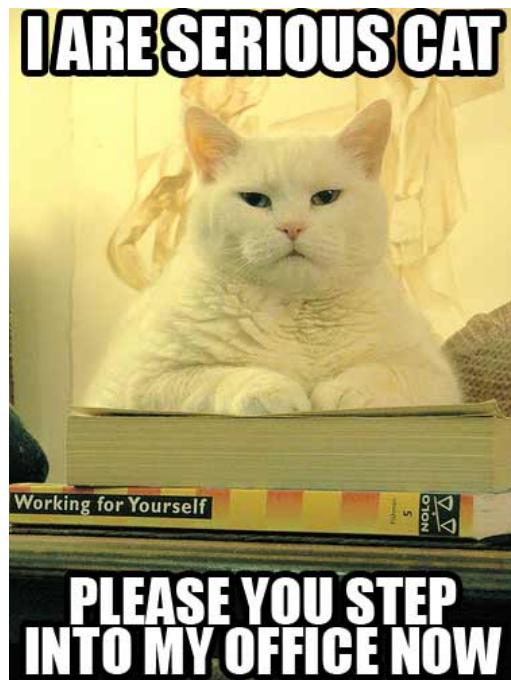


The Different Browsers



The Different Browsers





<http://www.flickr.com/photos/brownpau/533267369/>

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How do we start?

<video>

The Source

```
<video src="funny_cat_video">
```

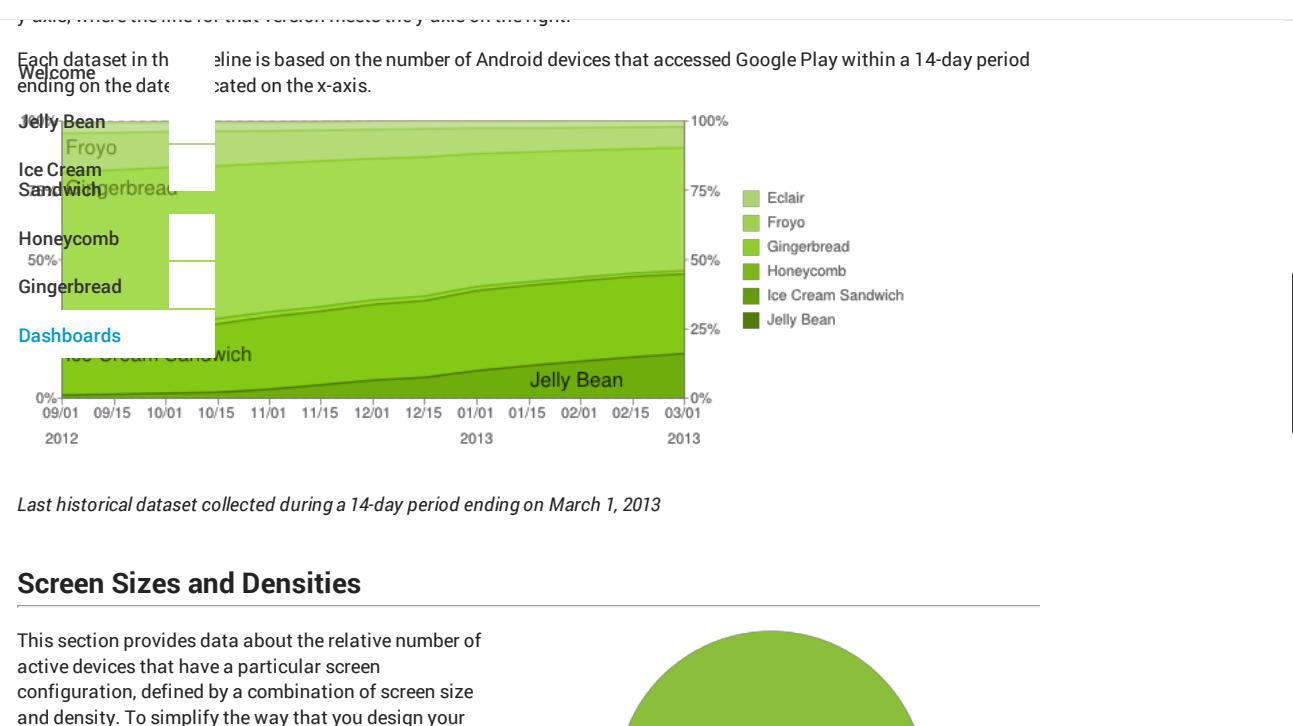
The Source

```
<video src="funny_cat_video.webm/mp4/ogg">
```

Mobile Formats Support

Chrome	Safari	Firefox	Opera	IE	Android
H264			Android 4.1+		
WebM	Android 4+		Android 4+		Android 4+
HLS					Android 3+

Platform Versions and Distribution



Screen Sizes and Densities

This section provides data about the relative number of active devices that have a particular screen configuration, defined by a combination of screen size and density. To simplify the way that you design your



The Source

```
<video>
  <source src="funny_cat_video.mp4">
  <source src="funny_cat_video.webm">
</video>
```

HTML

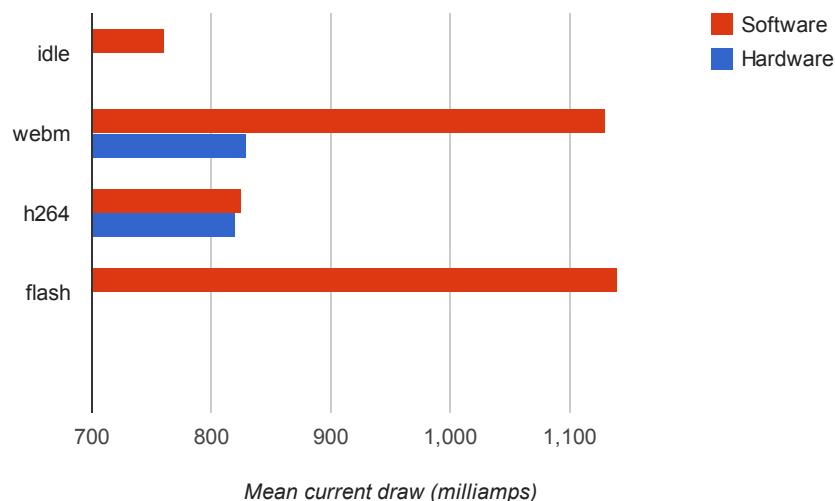
Power

cat wheel by Richard Norton



0:07 / 0:42

Playback Stats



Research done by Yossi Oren For more information visit <http://iss.oy.ne.ro/>

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Stick it in the page



- IE



Let's add a poster attribute and some click handlers

The image displays three screenshots of the Opera Mobile browser interface, each showing a different configuration of a video tag. The first screenshot shows a dark gray placeholder image with a play button icon. The second shows a white placeholder image. The third shows a thumbnail image of three cartoon cats. Each screenshot includes a list of bullet points describing the configuration:

- Video Tag with mp4 and webm streams
- Video Tag with empty onclick handler
- Video Tag with poster and click handler

Below each screenshot is a standard mobile browser navigation bar with icons for back, forward, search, and menu.

• Opera Mobile

A screenshot of the Opera Mobile browser on a mobile device. The address bar shows "gregthebusker.com/meow/pos". The page content displays a video tag with a poster image of three cartoon cats and a caption below it. The browser interface includes a status bar at the top showing signal strength, battery level, and time (2:36).

Video Poster

Very different behavior in different browsers

- Stretch poster image to <video> element size, or fit proportionally
- May replace poster image with a paused frame from the video
- May overlay a play icon that is different for each platform

Video Poster Pro Tips

Protips for a consistent look:

- Render your own cued state: for the poster, play icon
- Replace with the <video> when it's time to play
- Set the background color to black for continuity across platforms

How do videos play back?

1. Inline in the page

- iPad
- Android 4.0 and up
- Chrome

2. Always fullscreen, no matter what

- iPhone, iPod
- Android 2.2 - 3.0
- Windows Phone

Fullscreen-only <video>

Video element can be stuck anywhere on the page

- 1x1 pixels, or offscreen
- but: has to be in the DOM, can't be visibility:hidden or display:none
- just call play() to go fullscreen
- iPhone: zoom-in animation from <video>'s position

On webkit, good interaction with your webapp

- Video events still fire: timeupdate, ended etc.
- Free to change web page in the background
- webkitbeginfullscreen, webkitendfullscreen events

Fullscreen-only <video> caveats

Native controls only

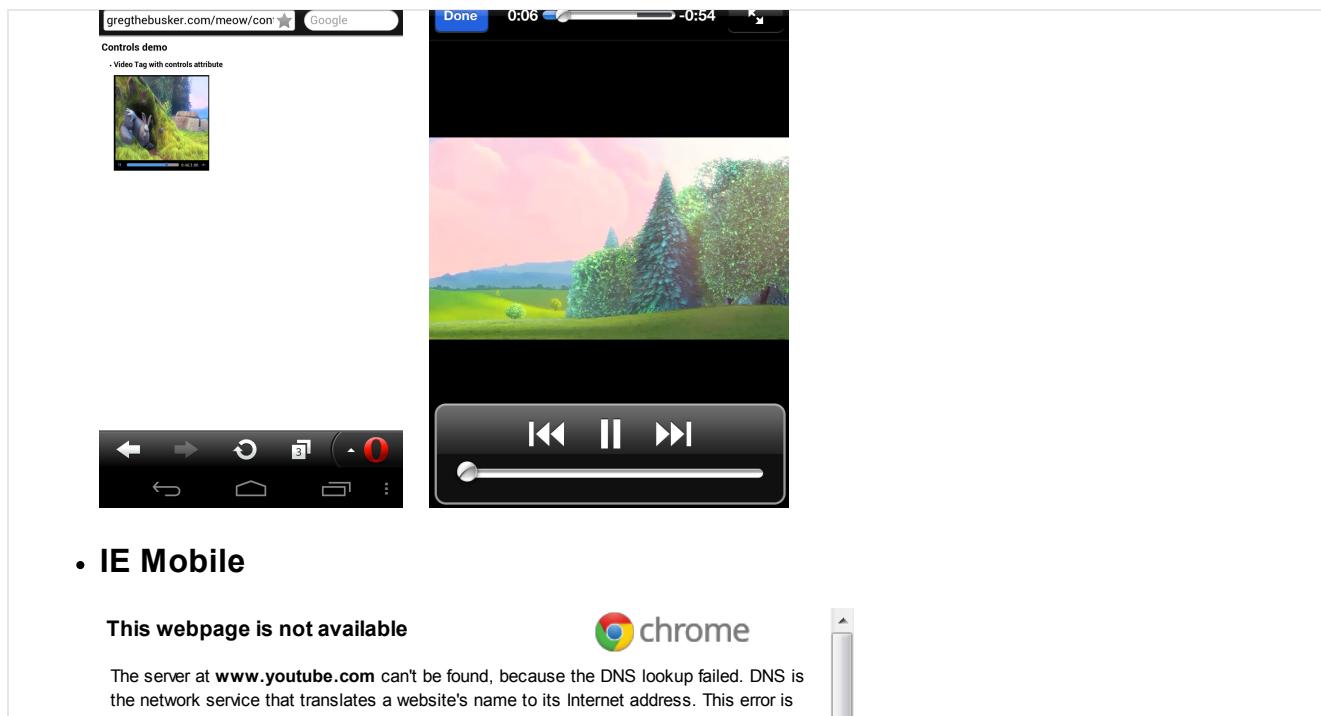
No overlays or custom UI

Can't do captions etc.

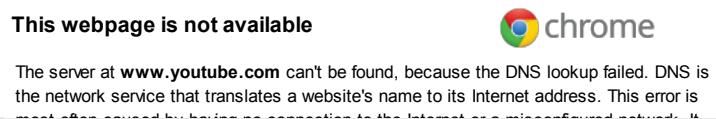
Controls

<video controls>

Controls



- **IE Mobile**



Native Controls Support

	Chrome	Safari	Firefox	Opera	IE	Android
Play/pause Button						
Volume Controls		Only in Fullscreen	Mute toggle only		Don't work in Android 4	
Seek bar						
Fullscreen	Button	Button and gesture				Button
Playback Type	Both	Fullscreen only on phones	Inline only	Determined by hardware	Fullscreen only	Both

Custom Controls

- Preserve your brand
- Unified experience across platforms and browsers

Custom Controls



Control size: [\[desktop\]](#) [\[touch\]](#)

Custom Controls

- Preserve your brand
- Unified experience across platforms and browsers
- Allows us to expand the set of controls and add our own
 - Annotations
 - Playlist
 - Captions
 - More

Custom Controls Pro Tips

- User expect to be able to drag the progress bar
 - Need to remember to prevent scroll on touchstart
- Volume can't be set everywhere and users are accustomed to using device controls
 - So don't build controls for it
- Fingers are fat
 - Average finger is 11mm so make targets at least 40px with 10px padding
 - Use SVG's so icons can be scaled and shared with desktop application
- Don't trigger content with hover
- Fullscreen
 - The browsing context is always fullscreen so fake it

Fullscreen

requestFullscreen

What about Mobile?

Isn't it already fullscreen?

Yes (sort of)

MobileFullscreen

- Open New Tab
- Remember size context changes so use viewport to scale icons and controls
 - `@viewport { width: device-width; }`
- `webkitEnterFullscreen`
 - Webkit only
 - Just the video element
 - Native controls only
 - metadata must be loaded
 - Only in click event

Autoplay

<video autoplay>

Autoplay



Autoplay

- Doesn't work! Restriction: need user action.
- Why?
 - On a cell network - users charged for data
 - Slow downloads, let the user decide
- Where?
 - Safari on iOS (iPad included, even on WIFI)
 - Android Browser (4.0+)
 - Chrome on Android

Autoplay

What about everyone else?

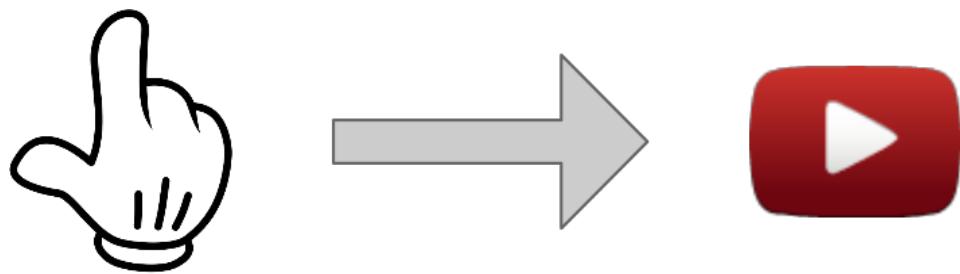
Autoplay Support

	Chrome	Safari	Firefox	Opera	IE	Android
--	--------	--------	---------	-------	----	---------

Attribute

Scripted		Buggy, going away
----------	--	-------------------

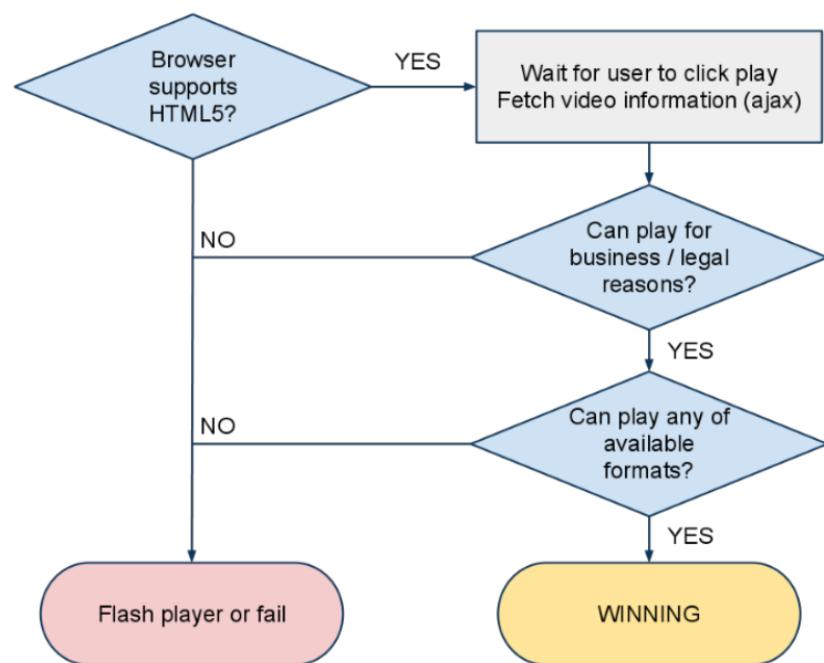
Autoplay



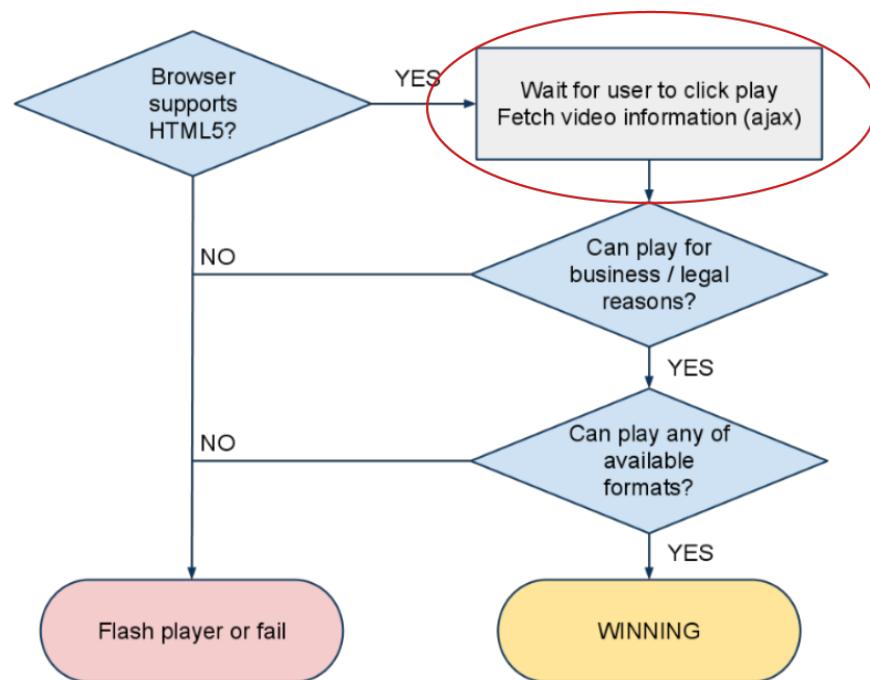
Autoplay

```
<video onclick="this.play()">
```

Autoplay



Autoplay



Autoplay

```
<script>                                              JAVASCRIPT
  function someClickEvent(evt) {
    // In a user initiated thread.
    myVideoElement.load(); // Magic incantation to enable play() later on!
    getVideoData(); // Triggers an ajax call.
  }

  function onGetVideoDataReturned(data) {
    // Not in a user initiated thread.
    setVideoElementSrc(data);
    myVideoElement.load();
    myVideoElement.play();
  }
</script>
```

Autoplay

```
<script>                                              JAVASCRIPT
  function someClickEvent(evt) {
    // In a user initiated thread.
    myVideoElement.load(); // Magic incantation to enable play() later on!
    getVideoData(); // Triggers an ajax call.
  }

  function onGetVideoDataReturned(data) {
    // Not in a user initiated thread.
    setVideoElementSrc(data);
    myVideoElement.load();
    // For Android
    window.setTimeout(function() {
      myVideoElement.play();
    }, 0);
  }
</script>
```

Embeds in an HTML5 world

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Embeds

- <script>
 - We need our content to be sandboxed
 - More than just a video tag
- <object>
 - Can load content with the data attribute
 - But no way to interact with it via JavaScript
- <iframe>
 - Allows our content to be sandboxed
 - JavaScript API communication

Embeds

```
<iframe type="text/html"  
width="640"  
height="385"  
frameborder="0"  
src="http://www.youtube.com/embed/VIDEO_ID"  
allowfullscreen>  
</iframe>
```

HTML

- Plan for the future (if you can)

Iframe Pro Tips

```
html {  
    /** Hack to fix iPhone resizing. */  
    overflow: hidden;  
}
```

CSS

```
body {  
    /** Dymanic Resizing **/  
    background-color: #000;  
    height: 100%;  
    width: 100%;  
    /** Remove highlight when use clicks **/  
    -webkit-tap-highlight-color: rgba(0, 0, 0, 0);  
}
```

CSS

Offline and Storage

{codemotion}

<http://www.flickr.com/photos/dannykboyd/5048495262/>

Appcache

- Offline mode for a video streaming site - useless?
- More than just offline access: saves on latency every visit
- Pay for code size twice: download + parse time
- Saves the download time

Appcache

```
<html manifest="manifest_url">
  <script src="script.js" />
  <link rel="stylesheet" href="style.css" />
</html>
```

HTML

CACHE MANIFEST

HTML

CACHE:
script.js
style.css

NETWORK:
file_to_always_load.jpg

Appcache - How to force an update?

CACHE MANIFEST

CACHE:

foo.js

Build date: 20120628

HTML

```
// Random AJAX response
{ "data": ...,
  "buildDate": 20120628 }
```

JAVASCRIPT

```
var scriptBuildDate = 20120621; // Auto-generated during build or ...
if (someResponse.buildDate > scriptBuildDate) {
  window.applicationCache.update();
}
```

JAVASCRIPT

Appcache gotchas

- GET parameters on cached resources bypass the cache
- Strict implementations (eg. iOS5) refuse to download files not in the manifest
 - since YouTube streams from many domains, we just put
NETWORK: *
- Can get wrong in a scary way
 - Users stuck on old code
 - Create multiple copies of the entire site in the cache
- Easy to break master URL
 - some redirects to an appcached site: 303 or history.replaceState
 - history.pushState before background download completes
- Some implementations are buggy

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<Thank You!>

can haz question?

<http://www.flickr.com/photos/cloudzilla/378829651/>

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