



Browsers on the move

2007-05 to 2008-06

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Prologue: Biggest browser milestones of past 12 months?

- 2007-06: iPhone released with Safari/WebKit
- 2008-03: IE8 beta released

Outline

- Part 1: Mobile-browser milestones
- Part 2: CSS/DOM browser changes
- Interlude: Web dev tools in browsers
- Part 3: Cross-doc/site, offline apps, local storage
- Part 4: XSLT/XPath, SVG, ARIA

- Part 5: Assorted other changes/updates
- Part 6: WebKit CSS innovations
- Part 7: The year ahead

Part 1: Mobile-browser news

- iPhone Safari/WebKit
- Opera Mini 4 (and for Android)
- Opera Mobile
- Mozilla Fennec
- WebKit on Android, Qt, Windows Mobile, S60

iPhone Safari/WebKit browser



iPhone Safari/WebKit browser

- Essentially same WebKit engine as desktop OSX Safari browser
- Web standards support: CSS, DOM scripting, XHR, etc.
- **NEW:** Squirrelfish, Safari 4 (2008-06)

Squirrelfish



Squirrelfish (2008-06)

- **1.6 times** faster than Safari 3.1 JS interpreter
- **1.8 times** faster than Tamarin (Adobe/Mozilla2 JS interpreter)

- Has potential to significantly speed up Web-application performance on **iPhone**

Opera Mini 4 released (2007-11)

- same engine as **Opera 9.5**
- Adds support for `table`, `ol`, `ul`, heading levels, more



Opera Mini 4 standards support

- Improved JavaScript support (see dev.opera.com articles)
- “Vastly improved” CSS support, including CSS3 selectors, media queries, [text-shadow](#), more

Opera Mini “ported” to Android

- Relies on **MicroEmulator J2ME** implementation
- **Translates J2ME/MIDP API calls in Android calls** (essentially Java SE calls)

Opera Mini in the millions and billions...

- now 35 million Mini users
- browsing 1.7 billion pages/month

...Opera Mobile in millions too

- Opera Mobile **preinstalled** on 100+ million phones
- Only ~25 other companies in “100 million club” (with products preinstalled 100+ million phones)
- see visionmobile.com report

Mozilla “Fennec” mobile



- 2008-04: “pre-alpha” build released
- 2008-08: target for “A1” first full alpha

Fennec goals

- **competitive performance**
- support for XUL/extensions
- genuine integration with device features
- touchscreen UI and zoom

Fennec platforms

- current priority: Linux (ARM and x86)
- 6 times faster than Moz MicroB on (ARM-based Linux) Nokia 810
- also plans for Windows Mobile

Fennec: more info

- drop by **#mobile on irc.mozilla.org**

WebKit everywhere...

Google Android & WebKit (2007-11)

- WebKit is “rendering core for Android’s browser”
- Android APIs enable developer to use WebKit engine in their custom apps

Trolltech Qt & WebKit (2008-02)

- WebKit is now a core component of Qt 4.4+ framework
- Enables developer to use WebKit engine in their custom Qt apps
- **Trolltech acquired by Nokia**

Nokia S60 WebKit port

- **no public checkins since 2007-08**
- Nokia rumored to be working on updated port based on Safari 3.1-based WebKit code

WebKit on Windows Mobile

- 2008-02: **Iris browser** (Torch Mobile — **George Staikos**, of core WebKit Qt dev team)
- 2007-07: **Wake3** (Dan Zucker, former Access)

Part 2: CSS/DOM changes/ surprises of interest to Web developers

- CSS & unknown elements in IE
- native `getElementsByClassName`
- CSS3 Selectors
- Selectors API

CSS & unknown elements in IE

- Problem: IE won't apply CSS to unknown element `fu`
- Solution: `document.createElement("fu")`
- discovered by **Sjoerd Visscher** (see his blog or John Resig blog for details)

native `getElementsByClassName`

- began in JS libraries, now in HTML5
- now supported in Mozilla, WebKit/Safari 3+, Opera 9.5
- no native support in IE yet

CSS3 Selectors

- Opera 9.5 and Safari 3.1/WebKit
(thanks to KHTML devs) **pass all 43**
css3.info tests
- Mozilla/Minefield passes 36 of 43

- **NEW:** mozilla-central now has nearly complete CSS3 Selectors support (2008-06)
- IE8 passes only 14 of 43

Selectors **API**

- `querySelector` & `querySelectorAll` methods
- API for scripting DOM traversal using CSS3 Selectors
- supported in **WebKit** & **IE8**

Interlude: Web-developer tools in browsers

- Firebug for Mozilla
- new tools in IE8
- WebKit Web Inspector ~~& Drosera~~
- Opera Dragonfly

Firebug for Mozilla

- no big changes?
- same great tool as always
- **the standard** by which all web-dev tools in other browsers are judged

new tools in IE8

- DOM inspector
- set of CSS/layout tools
- script debugger

WebKit Web Inspector and Drosera

- Web Inspector: many improvements/
feature additions
- Drosera (script debugger) with WebKit
nightlies

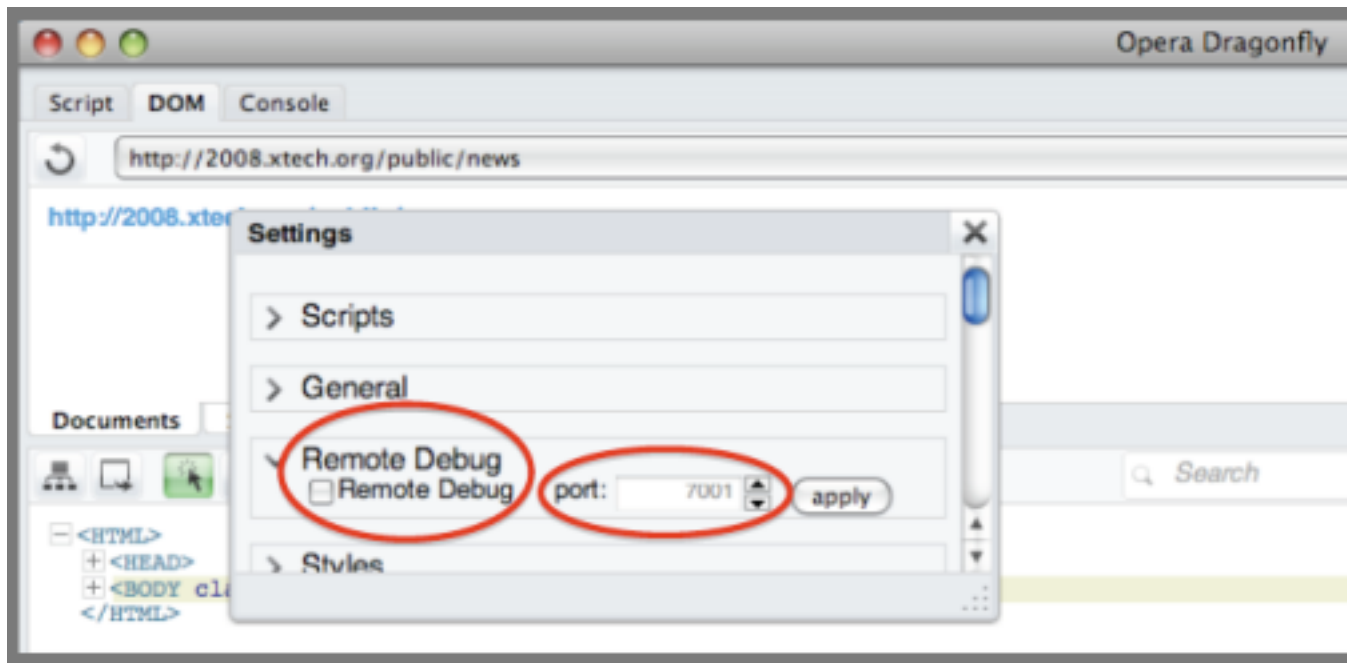
- **NEW:** JS debugger now built into Web Inspector (2008-06)

Opera Dragonfly (2008-05-06)

- DOM, CSS inspectors
- script debugger
- **remote debugging** (inspired by Fiddler?)

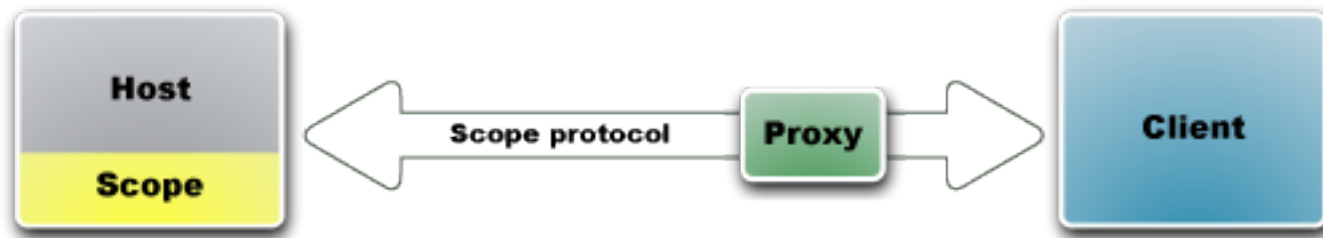
Dragonfly remote debugging

“Debug your phone or TV”



Dragonfly architecture

“Scope” protocol & API



Part 3: Cross-doc/site and local storage

- cross-document messaging
- cross-site requests
- offline apps
- client-side persistent storage (name/value pairs)

- client-side SQL database API

Cross-document messaging

- HTML5 `postMessage` method
- Implemented in **IE8, Opera, WebKit, Mozilla**
- can use with `iframe` as primitive for cross-site requests

Proposals: cross-site requests

- W3C Access-Control spec
- XMLHttpRequest
- Microsoft XMLHttpRequest (XDR)

Status: cross-site requests

- W3C Access Control **implemented in Mozilla but backed out from FF3** for still-unclear reasons
- Microsoft XDR surprise release in IE8
- XMLHttpRequest: no signs of any browser vendors interested in implementing

Offline Web applications

- `ApplicationCache` API
- each app maintains its own **manifest** and **cache**
- implemented in Mozilla/Firefox 3
- work in progress for WebKit

HTML5 Client-side persistent storage (name/value pairs)

- Storage interface, `sessionStorage` & `localStorage` attributes
- enables offline apps, more
- in Mozilla and IE8
- work in progress for WebKit

Client-side SQL database API

- Gears-like, spec'ed in HTML5
- Implemented in Webkit
- **Demo** at <http://webkit.org/misc/DatabaseExample.html>

Part 4: XSLT/XPath, SVG, ARIA

- XSLT with document() & node-set()
- SVG in Opera, Mozilla, WebKit
- ARIA in IE8, Opera, Mozilla

client-side XSLT/XPath

- Opera added support for **document()**
- WebKit joins Opera, IE in supporting **node-set()**
- we now have scripted XSLT/XPath — XSLTProcessor, DOMParser|loadXML,

XMLSerializer — in all four major
browser engines

SVG

- Opera support remains strong
- WebKit SVG support greatly improved; recent big changes to enable SMIL-based SVG animations
- Mozilla support remains good

ARIA

- mechanism for making Web apps usable with screen readers
- used in Google Reader (2008-03)
- supported in Mozilla, Opera, **and IE8**
- work in progress for WebKit

Part 6: Assorted other changes

- HTML5 registerProtocolHandler()
- JavaScript Getters and Setters
- <video> element
- IE8 <meta> versioning switch
- Acid2 and Acid3

HTML5 registerProtocolHandler()

- enables a Web app to register as handler for particular protocol/scheme
- example: **Web-based mail app**
registers as a handler for **mailto:**
- implemented in Firefox 3 (2008-04)

JavaScript Getters and Setters

- enable data-field **encapsulation**
- in Mozilla, Safari 3, & Opera 9.5 betas
- not supported in IE8 yet

HTML5 <video> element

- `<video src="foo.ogg" id="foo_video">`
- Extensive scripting API for loading and playing

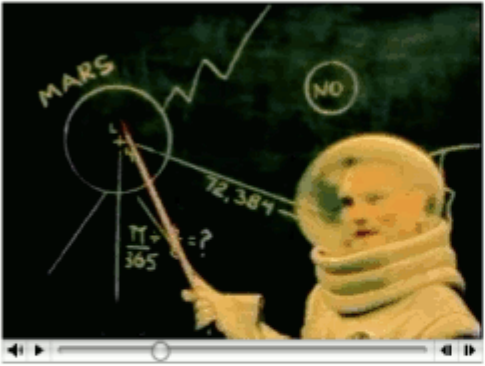
Simple <video> example

W3C Editor's Draft

3.12.7 The **video** element

Simple video example

http://www.w3.org/2008/Talks/05-07-smith-xtech/video.html



~/Desktop — vim — 94x11

```
<!doctype html>
<html>
  <head>
    <title>Simple video example</title>
  </head>
  <body>
    <video controls src="http://quicktime.tc.columbia.edu/users/lrf18/movies/sixties.mov">
  </body>
</html>
```


Browser support for <video>

- Safari 3.1 and WebKit nightlies
- Mozilla/Firefox trunk build + patch for bug 382267
- Opera experimental build
- no IE support yet

The <video> problem

- No royalty-free codec = no portable video
- Opera and Mozilla have support for Ogg Theora, Safari and IE don't (and won't)

A <video> solution?

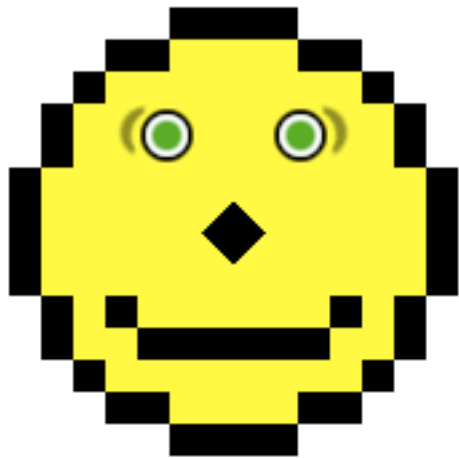
- H.261-based Sun OMS video could be possible solution: see <http://xrl.us/omsvideo>
- But it's unclear how feature-competitive the proposed OMS codec would be

IE8 <meta> versioning switch

- `<meta http-equiv="X-UA-Compatible" content="IE=7"/>`
- switches which rendering engine IE8 uses
- defaults to IE8 if not specified

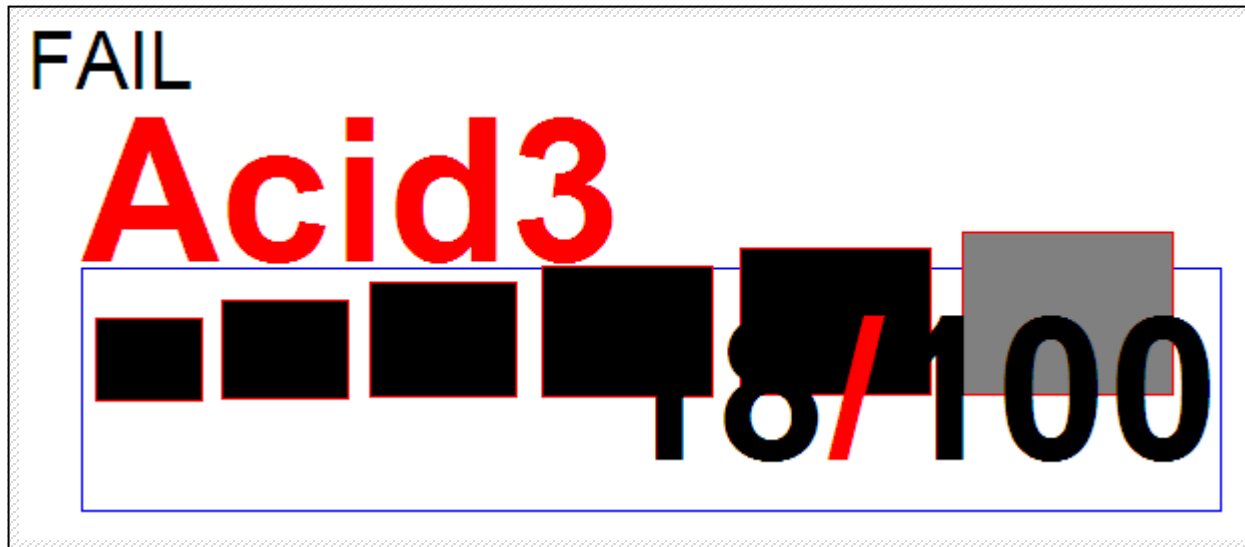
Acid2 and IE8

- IE8 passes the Acid2 test



- Safari, Mozilla, Opera passed long ago

Acid3 and IE8



Acid3 reference rendering

Acid3



100/100

To pass the test, a browser must use its default settings, the animation has to be smooth, the score has to end on 100/100, and the final page has to look exactly, pixel for pixel, like [this reference rendering](#).

Acid3 in other browsers

- **WebKit nightly: 100/100**
- Opera dev build: 100/100
- Opera 9.5: 78/100
- Safari 3.1: 75/100
- Firefox 3/Minefield: 71/100

Part 6: WebKit CSS innovations

- Reflections: `-webkit-box-reflect`
- Alpha masks: `-webkit-mask`
- Canvas images: `-webkit-canvas`
- Gradients: `-webkit-gradient`
- Transitions: `-webkit-transition`
- Transforms: `-webkit-transform`

Part 7: The year ahead

- updated browsers/engines on mobile
- Google Summer of Code dividends
- further CSS innovation
- further HTML5 implementations
- **your predictions?**

Web browsers/engines on mobile devices

- Opera Mobile 9.5
- Android and Qt devices ship with WebKit browsers?
- updated Safari for iPhone, updated S60 browser

Google Summer of Code: WebKit projects

- SVG filters
- Web Forms 2.0
- XBL2

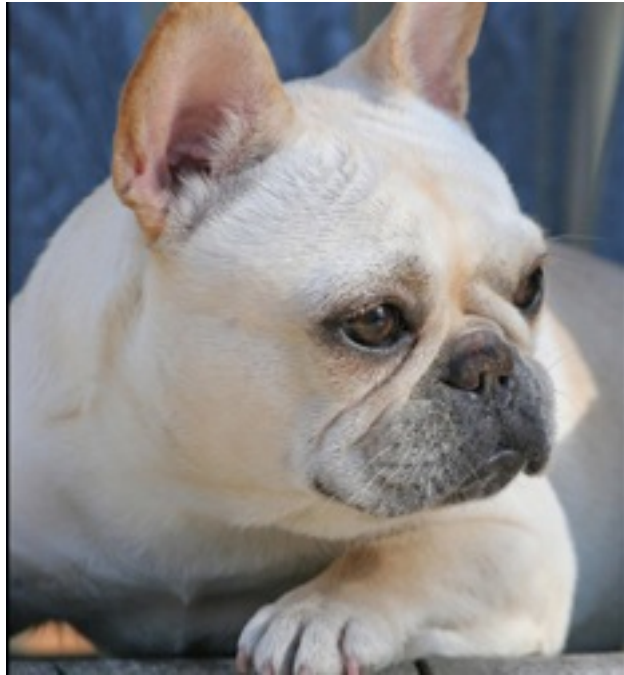
Further CSS innovation

- WebKit `@keyframes`, `-webkit-animation`
- WebKit CSS standardized?
- other browsers pick up WebKit CSS?

Further HTML5 implementations

- more sessionStorage implementation
- client-side SQL database
- offline Web apps (App. Cache API)
- embed non-visible data using `data-*` attrs & `dataset` DOM attr

Questions? Comments?



year ahead?

Your predictions for the

These slides

[http://w3.org/2008/Talks/05-07-smith-xtech/
slides.pdf](http://w3.org/2008/Talks/05-07-smith-xtech/slides.pdf)