Apple iPhone Tech Talk Notes

San Francisco
24 Aug 2007
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RIActant Development (www.riactant.com)

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Development Scenarios

Good = Compatible with Safari on iPhone
- Displays correctly as designed for Safari
- Contains no Java, Flash, or Plug-ins

Better = Optimized for Safari

Best = iPhone Application
- Optimized for Safari
- Provides discreet functionality
- Looks/feels like native iPhone application
- Minimizes user awareness of browser experience
- Integrates with iPhone apps (Google Maps, YouTube, dialer, etc.)

Safari on iPhone (Mark Malone, Internet Technologies Evangelist, Apple, mmalone@apple.com)

"Ensuring compatability and optimization"

Safari 3.0
- Variants: Safari 3.0beta for Windows
  Safari 3.0beta for Tiger
  Safari 3.0 RTM iPhone
- All variants share the same WebKit engine
- WebKit engine is Open Source
  - Available at WebKit Open Source Project: nightly builds/BugZilla DB/IRC chann
- Diff between Safari 3.0beta desktop and Safari 3.0 iPhone
  - iPhone only supports subset of events
- Ensuring Compatability Top 10

1. User can set browser prefs (JS off/on, pop-ups on/off, cookie policy conservative)
2. Separate page content (.js, .css, .html so each can be cached)
3. Be well-formed and standard (well-formed XHTML.less passes/parsing of page before render)
   1. HTML 4.01, XHTML 1.9, no WML
   2. DOM
   3. CSS 2.1 and some CSS 3
   4. ECMAScript 3
4. Be Browser Agnostic (don't code for user-agent, use objectDetection instead)
   1. e.g. if ("showModalDialog" in window)
   2. Use the W3C standard way of accessing page objects using getElementByID()
   3. iPhone User Agent String Anatomy
      1. iPhone;U;CPU like Mac OS X; en – Platform information
      2. AppleWebKit/* - WebKit engine build number (the lowest common denom)
      3. Version/* - Safari family version
      4. Mobile/* - OS X build number
      5. Safari/* - Safari build number
5. Leverage CSS 3 Media Queries – great way to load the correct CSS for the device
   1. Device specific values – screen, print, handheld, etc.
   2. iPhone uses "screen" - print, handheld, etc are ignored
   3. Use device-width or max/min-device-width
   4. -webkit-border-fit
   5. -webkit-column(s-*)

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6. CSSPropertyNams.in – http://trac.webkit.org
6. Know the Resource Limits per resource
    1. 10MB per text resource – html, js, css, etc.
    2. 8MB images (tiff non-anim gif png) (H x W x 4)
    3. 32MB per jpg image
    4. Animated GIFs 2MB limited (h x w x frames so they can maintain framerate) – if bigger, shows first frame only
    5. If page content on disk < 30 MB it should load fine on iPhone
    6. Know Scripting Constraints
        1. 10MB JS stack/object alloc
        2. 5 sec JS execution limit (catch will get called if exceeded ina try/catch)
        3. Scripts may be paused in inactive windows or Safari not active
            1. Scripts are not paused during QT playback
    7. Use Supported Windows and Dialogs
        1. window.open() work
        2. target="_new" works
        3. 8 window max
        4. alert() works
        5. confirm() works
        6. prompt() works
        7. No showModalDialog()
        8. No print()
    8. Natively Supported Content Types
        1. Excel xls (converted to HTML by webkit, supports multi-page)
        2. PDF
        3. Word doc
        4. Text
        5. QuickTime Audio/Video
        6. No Java/Flash/SVG
        7. What do you use for vector-based animation on iPhone? Use Canvas!
            1. <canvas></canvas>
            2. Introduced in Safari 2.0
            3. Adopted by other browser engines
            4. Part of WHATWG spec
            5. It's what Apple uses for their native iPhone apps (clock, stock ticker, etc.)
            6. Complete implementation
        8. No file system access
        9. <input type="file"> not supported
    9. Built in Fonts
            1. Arial
            2. Courier/New
            3. Georgia
            4. Trebuchet
            5. Zapfino
            6. Helvetica
            7. Times/New Romain
            8. Verdana
    10. Test and Debug with Safari 3.0 on desktop

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1. Use element inspector
2. Use Drosera – HTML/JS/CSS based app. Attach to running version of Safari, set breakpoints, etc. download from webkit.org
3. Test on iPhone

Optimization Techniques for iPhone

Form factor is compact

Content is scaled

- Window sized to 980 x 1091 in memory, then scaled to fit 320 x 480 (default mechanism)
- xhtml-mobile/.mobi sized to 320, not scaled
- viewport metatag <meta name="viewport" content="width:320"/> is a way of telling iPhone exactly how to scale the page
  - width=[]
  - initial-scale=[] specify 1 for 320 portrait, 480 for landscape
  - minimum/maximum-scale=[] to limit user scaling
  - user-scalable=yes/no, allow/prevents user scaling
  - Best Practices: set only width (320 for apps or other value)
- Prevent Zoom via double-tap
  - Override default -webkit-text-size-adjust: none
  - -webkit-text-size-adjust: auto (default)
  - By percentage, by element

Fingers are for input

- no right mouse click, no hover
- don't assume scroll bars are visible
- don't use hover styles
- mouseOver still works
- leave room for a finger
- Box content for double-tap
- Custom <select> implementation
  - <select> lists appear as a rolodex-like interface
  - supports grayed out items
- One finger gestures
  - pan – move page contents
  - tap/double tap
  - flick
- Two finger gestures
  - pan, scroll iframes and overflow (fairly hidden and not used)
  - Pinch – zoom in/out
- Finger Events
  - 1 Finger Events
    - click
    - mouseDown
    - mouseUp
    - mouseMove
  - 2 Finger Events
    - mousewheel called on one finger tap or two finger pan

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- Form and Document Events
  - blur
  - focus
  - load
  - unload
  - reset
  - submit
  - change
  - abort
- Unsupported Events
  - cut copy paste
- Wireless
  - EDGE: 70-135kbps, 200kbps burst
  - WiFi: 54mbps
  - Best Practices:
    - Send compressed content
    - Match image size to image presentation
    - Minimize image use – use canvas which is all text
    - Use CSS border, border radius or Canvas
    - Use small bgnd images and tile with bgnd-repeat
    - Use QuickTime reference movies
    - Auto-redirect to mobile specific site – don't do it

Creating Applications for iPhone

Essential Characteristics

- iPhone compatible _ optimized
- Provides native application experience
  - AJAX site
  - Use familiar iPhone layouts (e.g. rounded rectangle layout for record details, edge-to-edge layout fo list based info)
  - use familiar animation (screen slide in/out)
  - leverage existing libraries:
    - www.joehewitt.com/iui
    - YUI developer.yahoo.com/yui
    - dojotoolkit.org
    - prototypeejs.org
- Integrate with built-in apps
  - Maps Query: /maps?q=peets+coffee+seattle+wa
  - Maps: location
  - Maps:directions daddr saddr
  - Telephone: tel:
  - Mail – mailto: cc, subject, body
- Best Practices:
  - use CSS to size native controls (button height 30 px, select height 30 px, etc.)
  - use round rect template (8px x 8px radius) -webkit-border-radius:8px
  - add animation
- Wishlist
  - geo-positioning

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- hide nav bar
- hide address bar
- scrollTo()

- File a bug
  - bugreporter.apple.com

Design is Critical

Designing for the iPhone

Define Your Solution

Create an application definition statement

-What does it do well and who is it for?

What is the macro functionality of my site – used most often features

Your Appearance

Interaction Design Tips

No "finger up" event

Simple and straightforward is best

should be dead easy to use

Avoid entirely interactive website

minimize animation

avoid distracting the user from primary task

avoid hiding functionality behind rollovers

Minimize Text Entry – use lists

Don't require users to enter information

Prevent zooming

Control vertical scrolling only

Remember previous entries

Get users to action quickly/get them to info quickly

Optimize for Bandwidth

Design lightweight pages

Minimize the use of large graphics

Optimize for User's Time

Clean and well organized

Try to fit app into iPhone UI model as much as possible

Get users to content quickly

Visual Design Tips

Remember - The iPhone is not a laptop

Space is a premium

Use badging to communicate status

Use built-in fonts

Reduce clutter

Row height should be 44 pixels for fingers

Buttons should be 30 px or 29 px high visually, the hotspot should be 44 px

Nav Pages should be Edge-to-Edge design

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Destination pages should be Rounded Rect design
Button/Link titles should be one word and also show as the title of the destination screen
Breadcrumb title should follow this convention
Avoid colons after labels
Use bold to indicate special emphasis, increased legibility, or to indicate sort order

Communicate Status

- Let users know something will take time
- Avoid users feeling like things have died
- Use Alerts cautiously and only when entire app is busy
- Show progress on a per item basis if possible

Managing Content and Synced Data for iPhone

Matt Drance, Sharing Technologies Evangelist
mdrance@apple.com

Leveraging current content on iPhone

Think "Dashboard"
Possibly capability to display iPhone app in a Dashboard widget??? seemed to allude to that fact
Use Canvas – secret revealed – the iPhone widgets all use Canvas and JS (e.g. tilegame)
Use media queries
Use widget object responsibly
Grow lists dynamically
We want people to forget they're in a browser
Cool trick – use black backgrounds to save battery life
Energy-friendly web apps :)

Producing iPhone-friendly video

Video can come from iTunes that is synced to iPhone
Use QuickTime Pro
iPhone Compressor 3 in FinalCut Studio
h.264 baseline, leverl 3, 640x480 or less, 30 fps
mov mp4 m4v 3gp formats
AAL 48 khz
Consider video aspect ratio: 16:9 or 4:3

Bandwidth & Storage
Movie to iPhone: 900kbps rate, 480x360, 128kb AAC/LC, m4v file
For EDGE: 64kb 176x144 16kb aac lc .3gp file

Reference Movies: all built into QuickTime already; looks for 3gp vs m4v file

Support Byte-range requests
Required for web playback
Check your MIME types: all 4 must be supported

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.mp4:video/mp4
Allow downloads > 2GB
There is no in-line playback: Use <embed href="movieURL"...
width
height
controller=true/false
target="myself" (don't spawn a new page for the playback)
type="video/quicktime"
scale="1" (means 100%)

Custom Viewers and Players
Provide a direct link to podcasts
Redirect player pages
Example: if (iPhoneDetected){...

Managing portable user data

Contact Data on the iPhone
Use AddressBook framework to get contact data onto the iPhone
Calendar Data on the iPhone
Use Leopards Calendar Store framework
Export ics files
To Do's not currently synced
Bookmarks (public sync schema)

Photos (auto image placement)

Wrap Up

Apple iPhone Tech Talk Team

John Geleynse, apple.com User Experience Evangelist
Mike Jurewitz, Developer Tools Ev
Allan Schaffer, Graphics Technologies Ev
Linda Ouandji, Developer Tech Support
Allison Vanderby, Bug Reporter
Mark Malone, Internet Technologies Ev
Stephen Tonna, QT Product Manager