

HTML5 and the web of tomorrow

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Contents

- Web platform: technology, standards, standardization
- CSS3
 - What's new?
- HTML5
 - What's new?
- Complementary technologies
 - Examples

<file:///C:/Documents%20and%20Settings/olleo/Skrivbord/G-processes/w3c/demos/%C3%ADndex.html>

What's the future?

- Web 1.0 – HTML & HTTP
 - Access to contents; ...
- Web 2.0 – Ajax
 - Create content; interactivity; ...
- Web X.0 {X > 2} – Web platform
 - Devices; ...
 - Web of Data
 - Web of Interaction
 - Web of Applications



Web platform – main drivers

- Economic: infrastructure investment; cost-effective creation/construction; ...
- Reach: usable everywhere; ...
- Stable: works today and tomorrow; ...

and ...

- New platforms: mobile; embedded; ...
- Expectations: user experience; technology up-take
- Competition: technology control; proprietary, ...

The Next Open Web Platform

- HTML 5
- CSS 2.1
- CSS 3 Selectors
- CSS 3 Media Queries
- CSS 3 Text
- CSS 3 Backgrounds and Borders
- CSS 3 Colors
- CSS 3 2D Transformations
- CSS 3 3D Transformations
- CSS 3 Transitions
- CSS 3 Animations
- CSS 3 Multi-Columns
- CSS Namespaces
- SVG 1.1
- WAI-ARIA 1.0
- MathML 2.0
- ECMAScript 5
- 2D Context
- WebGL
- Web Storage
- Indexed Database
- Web Workers
- Web Sockets Protocol/API
- Geolocation
- Server-Sent Events
- Element Traversal
- DOM Level 3 Events
- Media Fragments
- XMLHttpRequest
- Selectors API
- CSSOM View Module
- File API
- RDFa
- Microdata
- WOFF
- HTTP 1.1 part 1 to part 7
- TLS 1.2 (updated)
- IRI (updated)
- ...

Web Platform and the HTML5 space

- HTML5 in the narrow sense
 - The specification titled “HTML5” – *HTML & XHTML* !
- HTML5 in the wider sense – “Open Web Platform”
 - The HTML5 language as framework
 - CSS2/CSS3, SVG, MathML
 - Additional specialised technologies
 - Storage, threads, fonts, geolocation, ...
- Perspectives from different roles:
 - User
 - Author
 - Implementor
 - Specifier

“A Word from our Sponsor”

World Wide Web Consortium (W3C)

- W3C (World Wide Web Consortium)
 - The web standards organization Consortium



- Consortium 350 member organisations
- Founded 1994
- Creating web standards (“W3C Recommendations”)
 - HTML, CSS, SVG, RDF, PNG, MathML, XML, WCAG, EXI...

Open standardisation process

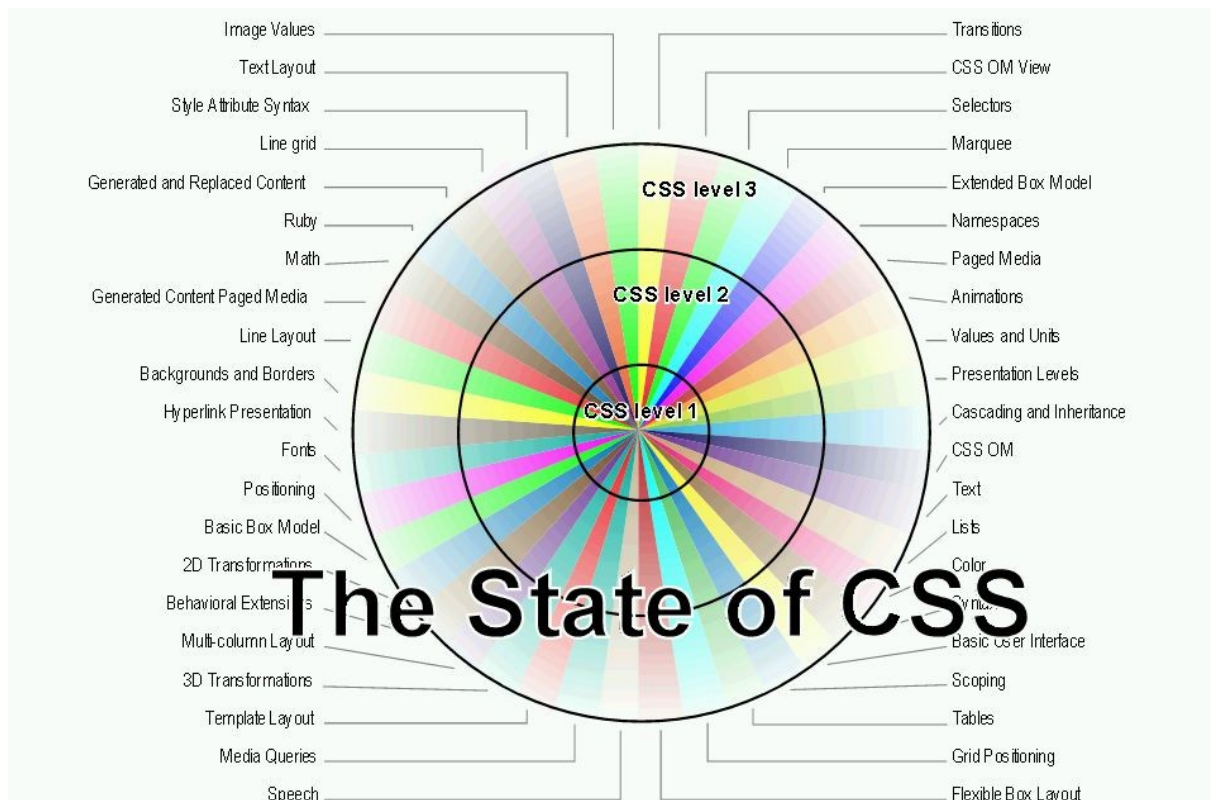
- Requirements driven and needs driven
 - Use cases, business needs, ...
- Proposals exposed to the world
- Comments and feedbacks incorporated
- HTML Working Group handles work on HTML5
 - ... in collaboration with WHATWG
 - Done as collaboration between IT companies
- Consensus in working group
 - Stakeholders are driving it
- Drivers: market; use; and technology

Challenges to standardisation

- Compatibility between standards
 - Combining web technologies
 - Combining standards
 - HTML + CSS; HTML + MathML; XHTML + Xquery; ...
- Compatibility across generations of a standard
 - Keep old stuff? How to shape new stuff?
 - HTML 3 => HTML 4 => HTML 4.01 => HTML 5
- HTML5 defined to:
 - integrate other standards
 - be "backwards compatible" & tolerant

CSS / CSS3

CSS – the big picture



CSS state: Stable & proven

Stable & proven

- CSS level 1
- Selectors
- ...

CSS state: Stable & implementing

Stable & being implemented – examples

- CSS level 2
- CSS Namespaces
- CSS Backgrounds and Borders
- CSS Multicolumn Layout
- Paged Media
- Color
- Media Queries
- Mobile Profile

CSS state: Almost stable

Almost stable – examples

- Template Layout
- 2D Transformations
- Transitions
- ...

CSS state: Not stable

Not stable

- Tables, Lists, Positioning, Generated & Replaced Content, Image Values, 3D Transformations, Fonts, Text Layout...

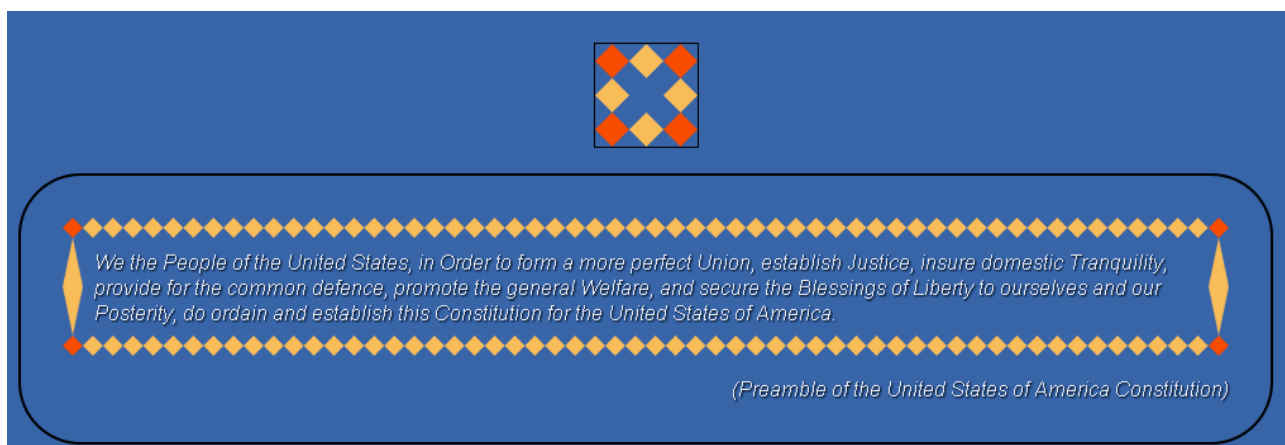
... apart from the properties that already in level 2

CSS 3 Selectors

- :first-child, :last-child, :nth-child(3), :nth-child(odd)

Date	Description	Deposit	Transfer	Withdrawal	Balance
10/08/2004	Restaurant	Expenses:Foods		38.14	440.67
10/10/2004	Market	Expenses:Groceries		123.14	317.53
10/11/2004	Gas	Expenses:Car		40.00	277.53
10/12/2004	Payroll	Income:Salary	2,000.00		2277.53
10/12/2004	Home depot	Expenses:House Supplies		41.14	2236.39
10/14/2004	Dentist	Expenses:Medical		166.20	2070.19
10/15/2004	Electricity	Expenses:Utilities		27.88	2042.31
10/16/2004	Filene's Basement	Expenses:Grooming		31.93	2010.38

CSS3 Borders



CSS Media Queries

```
<link rel="stylesheet" type="text/css" href="base.css" />
<style type="text/css" media="screen and (min-width: 481px)">
  @import url("advanced.css");
</style>
<link rel="stylesheet" type="text/css" href="base.css"
      media="handheld, only screen and (max-device-width:
480px)" />
```

This checker performs various tests on a Web Page to determine its level of mobile-friendliness. The tests are defined in the [mobileOK Basic Tests 1.0](#) specification. A Web Page is **mobileOK** when it passes all the tests. Please refer to the [About](#) page for more details. If you wish to validate specific content such as [markup validation](#), or [RSS/Atom feeds](#), or [CSS stylesheets](#), or to [find broken links](#), there are [other validators and tools](#) available.

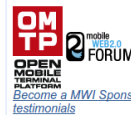
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CSS Examples

Simple illustrations

- *Background, borders ... visual decorations*
- *Media queries ... adapting to screen*
- *Transitions/hover ... dynamic behavior*

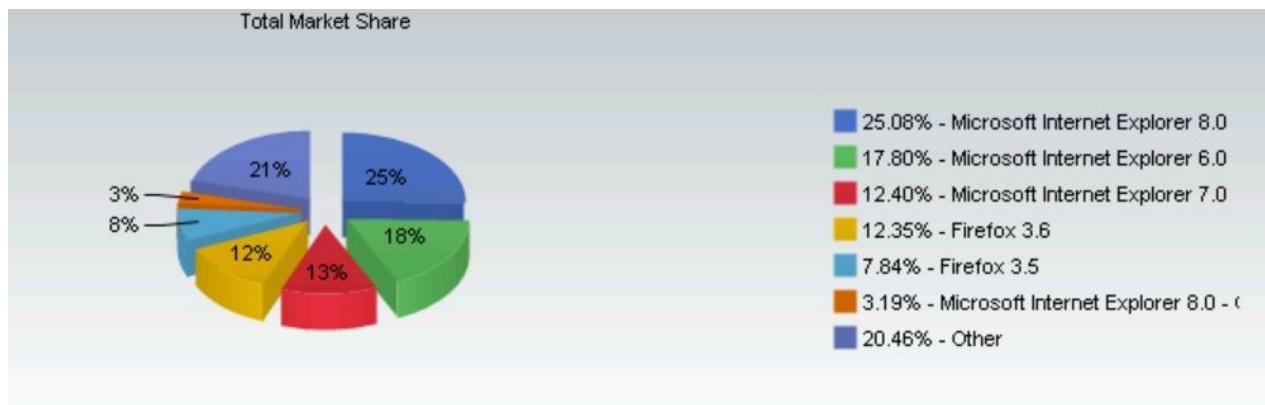
HTML5

HTML 5: Quick history

- 2004:
 - Opera, Mozilla, and Apple creates the WHAT WG (*Web Hypertext Application Technology Working Group*)
- 2007:
 - W3C restarts the HTML Working Group
- 2008:
 - January: First Public Working Draft
- 2010:
 - Apple, Google, Mozilla, Microsoft, and Opera (and others) are implementing, or are committed to, HTML 5
- 2014
 - Q2: Plan for publication as W3C Recommendation

HTML5 – approach

- Principle: correct HTML4 pages remain correct
- Goal: many incorrect pages still work, too
- New elements
- New attributes



HTML 5: HTML or XML?

- Two serializations
 - HTML serialization (`text/html`)
 - XML serialization (`application/xhtml+xml`)
- Incorporates SVG and MathML
- Incorporates DOM Core and DOM HTML

The HTML5 specification

W3C Editor's Draft



HTML5

A vocabulary and associated APIs for HTML and XHTML

Editor's Draft 13 January 2012

Latest Published Version:

<http://www.w3.org/TR/html5/>

Latest Editor's Draft:

<http://dev.w3.org/html5/spec/Overview.html>

Previous Versions:

<http://www.w3.org/TR/2011/WD-html5-20110525/>

<http://www.w3.org/TR/2011/WD-html5-20110405/>

<http://www.w3.org/TR/2011/WD-html5-20110113/>

<http://www.w3.org/TR/2010/WD-html5-20101019/>

<http://www.w3.org/TR/2010/WD-html5-20100624/>

New elements - structure

- **section:** generic document or application section.
- **article:** independent piece of content of a document.
- **aside:** content that is only slightly related to the rest of the page.
- **hgroup:** header of a section.
- **header:** group of introductory or navigational aids.
- **footer:** footer for a section.
- **nav:** section of the document intended for navigation.
- **figure** self-contained flow content.
- **figcaption:** caption'..

New elements – other 1/2

- **video** and **audio**
- **track**: text tracks for the video element.
- **embed**: plugin content.
- **mark**: marked or highlighted text.
- **progress**: completion of a task (downloading, ...).
- **meter**: measurement (disk usage, ...).
- **time**: date and/or time.
- **ruby**, **rt**, **rp**: ruby annotations.
- **bdi**: bidirectional text formatting.

New elements – other 2/2

- **wbr**: line break opportunity.
- **canvas**: dynamic bitmap graphics.
- **command**: command the user can invoke.
- **details**: additional information to user.
- **datalist**: data for comboboxes.
- **keygen**: key pair generation.
- **output**: output data (from scripts, ...).

New attributes ... examples 1/2

- `<input autofocus>`
- `<input placeholder="...">` – hint shown inside an empty input
- `<input form=ID>` – allows to put element outside form
- `<input required>`
- `<input min= max= step= pattern= >` – constraints
- `<ol reversed>` – count down

New attributes ... examples 2/2

- `<iframe seamless>` – render with intrinsic height instead of 150px
- `<contenteditable >` – a bit like textarea
- `<data-* >` – guaranteed non-standard attributes
- `<role= aria* >` – restore accessibility of incorrectly used elements
- `<input spellcheck>` – indicate that spellchecking is not useful

Other types of changes to markup

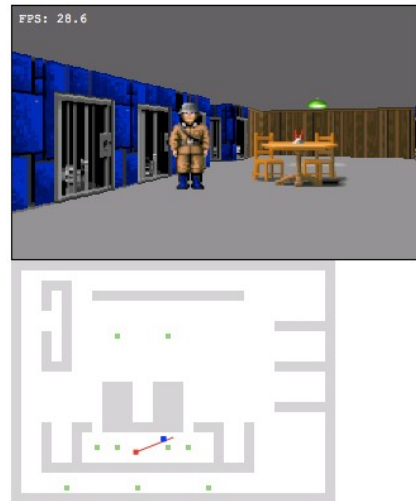
- Changed elements: **a**, **address**, **dl**,
- Changed attributes: `<script type=..>`, `<table border=...>`, ...
- Removed elements: **basefont**, **big**, **center**, ...
- Removed attributes: `<link target=...>`, ``, ...

Changes to internal structure

- New APIs: audio, video, drag-and-drop, edit,
- DOM extensions: HTMLDocument, HTMLElement

Canvas

- 2D drawing space
- Scripted manipulation
- Dynamic contents



Demo examples: html5

HTML 5.0 <video>

- `<video src='myMovie' id='myVideoElement' />`
-



Demo html5/video.html

Reasonable Requirements for a Video codec

- Known not to require per-unit or per-distributor licensing
- Compatible with the open source development model
- Of sufficient quality as to be usable
- Not an additional submarine patent risk for large companies
- Compatible with W3C Royalty-Free policy
-

None of the codecs fit the requirements for HTML 5?

Codecs and formats

Format Container: .avi, .mp4, .mov, .ogg, .flv, .mkv, etc.

Video codec:

H.264,
VP8,
Theora,
Dirac 2.1,
H.263,
etc.

Audio codec:

AAC,
WMA,
Vorbis,
PCM,
etc.

**Captioning,
Video description:**

SAMI, SMIL,
Hi-Caption,
CMML, DFXP,
3GPP TS 26.245,
MPSub,
etc.

Metadata:

MPEG-7,
CableLabs,
TV-ANYtime,
EBU,
XMP,
etc.

Codec implementations

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HTML5 VIDEO CODECS														
	MAC								WIN					
														
	CHROME	FIREFOX	OPERA	SAFARI	CHROME	FIREFOX	OPERA	SAFARI	IE					
	5	3.6	10.6	5 4	5 6	3.6 4.02	10.6	5	6 7 8 9					
Video: ogg	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	✗	✗	✗	68%
Video: H.264	✓	✗	✗	✓	✓	✗	✗	✗	✓	✗	✗	✗	✓	34%
Video: WebM	✗	✗	✓	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	13%

HTML Working Group

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- 54 W3C Member organizations
- 419 participants in the group
- 225 Invited Experts
- Coordinates with WHATWG .

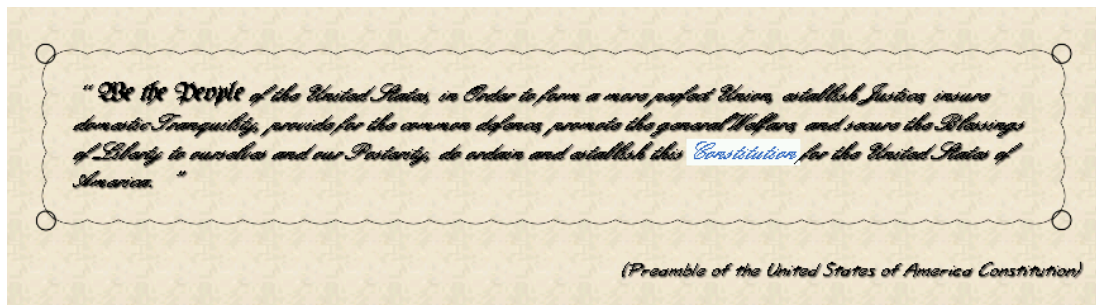
Tests suites

- Needed for approving as web standard.
- Extensive contributions from Microsoft, Opera and others.
- Have implementation results for 925 tests and currently 1276 approved test cases.
- 28,858 test have been submitted including ~8,000 are parser tests and another ~18,000 are for testing attribute reflection
- Test results (snapshot):
 - <http://w3c-test.org/html/tests/reporting/report.htm>

Technologies in HTML5 space

Fonts: WOFF File Format

- Web Open Font Format
- Already available
- Adaptation of existing font packaging
- Opens up new design / branding opportunities



... and many others

- Geolocation ... use geographical position (mobile!)
- Web applications ... small things on your desktop
 - Newsfeeds, ticker tapes, weather, timetables, ...
- Offline web applications ... working when not online
- Web workers ... threads for independent processing
- Web sockets ... bi-directional, full-duplex communications
- Device APIs ... calendar, contacts, camera, files, sensors, ...

HTML5 and apps

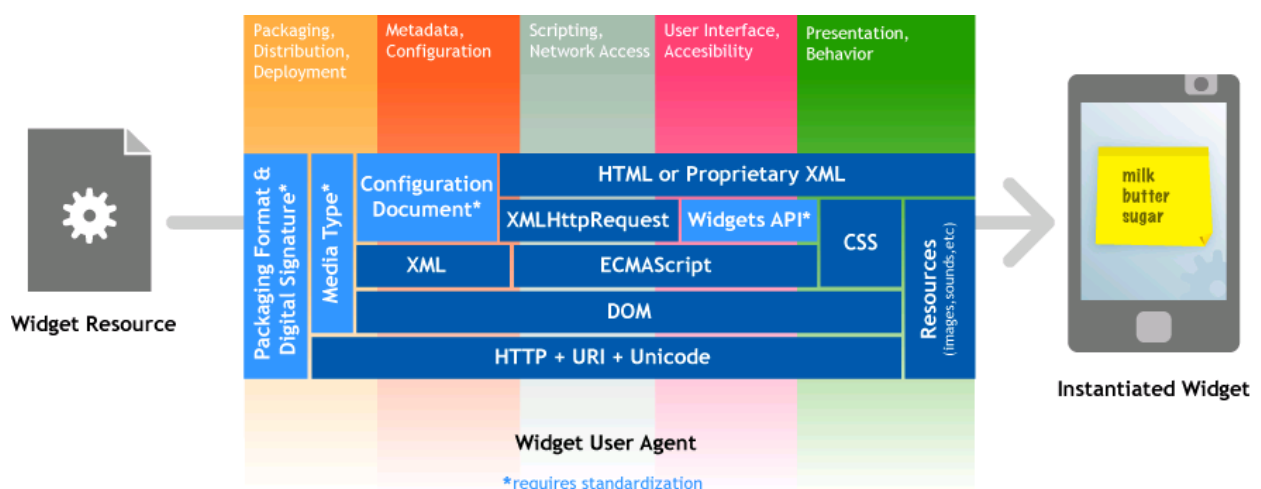
Apps – a practical objective

- Growth of mobile space
- A main driver for W3C work: support for “web apps”
- Supporting technologies:
 - HTML5
 - Functional components ... defined APIs

Web Apps @ W3C

- Web Applications (WebApps) Working Group
 - enable improved client-side application development on the Web, including specifications for
 - application programming interfaces (APIs) for client-side development
 - markup vocabularies for describing and controlling client-side application behavior.
- Widget
 - packaging and delivery
 - single download/installation
 - run as standalone (i.e., outside browser)
 - expressed in web technologies
 - executed in a small “virtual machine”

Widget technology stack – generic view



Web Apps: Technology APIs

- Web DOM4/Core API
- Indexed Database API
- CSSOM View Module API
- Drag Drop API
- Microdata API
- Selectors API
- Text Selection API
- RDFa API
- File API
- Undo History API
- Element Traversal API
- Web Events API
- 2D Context API
- XMLHttpRequest API
- Resource Timing API
- Web Storage API
- Web Notification API
- Audio API
- Web Sockets API
- DOM Level 3 Events API
- Messaging API
- Web Workers API
- Navigation Timing API
- Device API
- Web Messaging API
- Multi-touch Events API
- ...
- Geolocation API

Web Apps: Other candidate areas/needs

- Video Streaming (adaptive and live), P2P
- Digital content distribution and micropayment
- Certification (software and developers)
- TV remote, DLNA
- Data and query server discovery, service description
- Authoring tools support
- TV channels, Speech
- Federated query server
- Multilingual support
- More Web performance benchmarks
- Trust, Provenance
- Publishing pipeline: more on XML?
- 3D at the markup level (SVG equivalent)
- Read-write Web
- ...
- Identity, Access control
- Interoperability
- Security, Privacy
- Education materials

Web Apps vs Native Apps

Differences in terms of:

- Portability
 - Provisioning
 - Developer skills
 - Interoperability
 - Integrated web management
 - etc.
-
- Use vendor-specific functionality
 - Be seen in a specific AppStore
 - etc.

Will web apps happen?

“One Billion HTML5 Phones to be Sold Worldwide in 2013”

Boston, MA - December 7, 2011

According to the latest research from Strategy Analytics, *worldwide HTML5 phone sales will surge from 336 million units in 2011 to 1 billion units in 2013.*

HTML5 has quickly become a high-growth technology that will help smartphones, feature phones, tablets, notebooks, desktop PCs, televisions and vehicles to converge through cloud services.

<http://www.strategyanalytics.com/default.aspx?mod=pressreleaseviewer&a0=5145>

What does it all mean?

Summary

- Improved open web platform
- HTML5 as a framework
 - Integrating other web technologies
- Simplified web content development
 - Better match to 80% of needs
- Simplified web application development
 - Standardised technologies
- Improved portability
 - Standards conforming implementations

Thank you for your attention!