W3C and Cloud: Where do we meet?

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尽展万维网全部潜能
Lead the Web to its full potential

Anyone
Anytime
Anywhere
Any device
W3C Overview

• World Wide Web Consortium (W3C)
  – ~400 members
    • IT, non-IT, universities/institute/agencies
  – Global participates
    • Decentralized Architecture: 4 Hosts (MIT/ERCIM/KEIO/Beihang)
    • Global BD: ~20 offices in different countries
    • ~50 WGs, ~300 CGs, ~ 5000 Participants.
Mission of W3C

• Put the web to its full potential
  – Core + Web for All (WAI, i18n)

• Core: Define objects on the web
  – Address (URL), Formats, interactions, links, ...
  – Pages: HTML+CSS
  – Data on the Web: XML, Semantic (RDF/SPARQL)
  – Services: WS-* standards (WSDL, SOAP, ...) , not popular now, but ...

• Then, What’s Next?
Change #1: Pages -> Apps

• Web or Native, this is a question...

• What web developers needs
  – Compatible capabilities
  – ... mainly from local devices / OS / browsers
  – ... and this reached to HTML5
  – Performance
  – Application life cycles
## Application Lifecycle

Example: news app

<table>
<thead>
<tr>
<th>Native</th>
<th>Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installable (engagement+)</td>
<td>No installation needed (shareability+)</td>
</tr>
<tr>
<td>Available offline, background sync</td>
<td>Primarily on-line experience</td>
</tr>
<tr>
<td>Deeper hardware integration</td>
<td>Privacy guarantees</td>
</tr>
<tr>
<td>Alerts (engagement+)</td>
<td></td>
</tr>
<tr>
<td>Rich</td>
<td>Reach</td>
</tr>
</tbody>
</table>
Change #1b: Apps -> Pages

• Web or Native, this is a question...

• Most of the Apps are linking
  – ... with other apps
  – ... with back end platforms / capabilities / services
    • Identities, Payments,
  – ... with the contents / data
  – ... with the global data base – the WEB

• That’s what Web Do!
Change #2: PC->Phone->Devices

- Browser/Web Apps running on
Change #2: PC->Phone->Devices

• Browser/Web Apps running on
  – Mobile
  – TV
  – Cars, and maybe planes, rockets, satellites?
    • Linked Cars: OBD Data on the Web (Automotive WG)
  – Sensors, actors
    • Internet of Things need Web

• Make “objects” available ubiquitously
  – New Capabilities: NFC, Geolocation, ...
Change #3: Linked Page to Linked Data

• Big Data Era: Web is the biggest open data source, and DECENTRALIZED in nature.
• Government Open Data
• Linked Data
  – From RDF/SPARQL to LDP
  – Decentralized inter-connected data base / center
• DWBP
  – Data On The Web Best Practices
  – From XML to JSON, RDF, and to CSV
Change #4: New Services

- The **HEAVY Web Services** work is done!
  - WSDL, SOAP, ...

- But the SOA still active
  - More lightway approaches are adopted by industry
Change #4: New Services

- **Web of Things**
  - Motivation: Coordination between WoT Servers
  - Jan 2015: pre-standardization work

The Web as the Solution

"Things" as virtual objects acting as proxies for physical and abstract entities

metadata, events, properties, actions  
(over a variety of protocols including HTTP)

Three Classes of Metadata

![Diagram showing three classes of metadata: Things, Security, Communication](image)
Change #5: Security & Privacy

• Snowden
  – To build more secure Web
  – Build better context and channel between Web browser and Server (IEEE HTTP/2, SCP, Mixed Content, Privileged Context, ...)

• No privacy in Big Data Era?
  – Balancing the privacy and Web innovation
  – DNT, Tracking Scope...
A NEW WAVE of TRANSFORMATIONS
OWP: Core+AF

• Core: HTML+CSS+W4A
• Application Foundation:
  – from OS level capability to **platform level capability**
Web vs. Cloud

• Web:
  – More upper layer

• Cloud:
  – Infrastructures
  – Services
Web and Cloud
Both Large Economic Forces

• Web/Internet
  – McKinsey 2011: Almost $8 trillion exchange hands annually in e-commerce
    • ... and the Web is much more than e-commerce

• Cloud
  – Gartner: “The public cloud services market is forecast to grow 19.6 percent in 2012 to total $109 billion worldwide.”
  – Forrester: “The SaaS software market will increase 25 percent in 2013 to $59 billion, a 25 percent increase. In 2014, the market is expected to total $75 billion.”
  – McKinsey 2013: “We estimate the total potential economic impact for cloud technology across sized applications could be $1.7 trillion to $6.2 trillion in 2025...”
Look at this...

8 Trillion  v  100 Billion
Lessons learned from Web standards

• Universal architecture

• Interoperability

• Design for All

• Royalty Free policy

• Open Source vs. Open Standards
Open sources need Open standards

• Vendors make different choices for different business goals
• Design choices based on devices supported
• Open source reduces barriers to entry
  – Which brings in more players and diversity
    • Which perversely creates more choices and fragmentation
      – Unless there is also a standard
Open Standards

• Due process, cooperation, broad consensus, transparency
• Multi-stakeholder participation
  – Address use cases for diverse use cases
  – For social issues such as privacy you need all players
  – Web is global; need international participation
• Longevity
  – Ensure humanity’s knowledge remains available long into the future
  – Specifications are freely available
Open Participation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>358</td>
<td>370</td>
<td>378</td>
<td>398</td>
</tr>
<tr>
<td>Full</td>
<td>79</td>
<td>79</td>
<td>83</td>
<td>90</td>
</tr>
<tr>
<td>CG/BG Groups</td>
<td>82</td>
<td>128</td>
<td>193</td>
<td>205</td>
</tr>
<tr>
<td>CG/BG People</td>
<td>&gt;1,280</td>
<td>&gt;2,850</td>
<td>&gt;4,000</td>
<td>5,002</td>
</tr>
<tr>
<td>Twitter followers</td>
<td>35K</td>
<td>62K</td>
<td>84.5K</td>
<td>120K</td>
</tr>
</tbody>
</table>
Web vs. Cloud: Where meets?

• #1: Service Capability
  – To provide more *cloud service* capability to web applications
    • Cloud Storage/Web Storage
    • Capability Merging between Cloud and Client
    • Fundamental Services: Identity, Web Payment
  – Apps need more lightweight APIs
    • Good example: DMTF CIMI Restful HTTP
  – Cloud services need Open Standards
    • To avoid *vendor lock-in*
Web vs. Cloud: Where meets?

• #2: Data and Semantics
  – To provide more Data and Semantics to Apps
    • Semantic Web: RDF, SPARQL
    • Government Open Data (data.gov), open data market

  – Vision of W3C: linking data on the web
    • Linked Data Platform
    • Global linked database
Web vs. Cloud: Where meets?

• #3: Advanced Service Management
  – To Manage Services on the Web
    • Web of Things: WoT Services
    • Cloud Services

  – WS specs are too old, too heavy, but SOA is fine
    • Remember the triangle?

    • Endpoints and Binding: Service Interface based on Restful HTTP
    • Discovery
    • Serializing/ Deserializing Data/Parameters during services call
Web vs. Cloud: Where meets?

• #4: Shared Common Infrastructure
  – Web for All, Cloud for All
    • WAI: WCAG 2.0. Contents --- Apps --- Services --- Data
    • I18n: Multilanguage on the Web and Cloud
      – Chinese Layout Requirement (CLREQ)

  – Security and Privacy
    • Secure Communication Channel
    • Secure Context
    • User’s privacy policy should be enforced: DNT, Tracking Scope, ...
Summary

• Lessons from W3C
  – Architecture, Interoperability, RF, Open Standards

• Where Web meets Cloud
  – Closely linked, but with different focus
  – W3C is happy to contribute and collaborate
    • Open Platform Capabilities
    • Data and Semantic Support
    • Advanced Service Management
    • Shared Application Foundations
The time has come

- Participating to Global efforts on Cloud Standards
- Welcome to identify new use cases and requirements for the OWP (core + AF)

Royalty-Free Standards
For
Cohesive Cloud Architecture
Thank you for your attention!

More information on
http://www.chinaw3c.org
http://www.w3.org

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