

# New Directions for the Web

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SWXG

# Introduction

- Privacy is important for everyone
- Usability
  - Experience with P3P
  - Website terms & Conditions of service
  - User interfaces for signing up with websites
- Whose interests are they protecting?
- How much do ordinary people know?
  - Can I trust this site?
  - Where is it hosted?
  - What do my friends think?

# Anywhere, Any time

- My laptop
- My mobile
- My living room
- On vacation, when I step into an internet cafe
- In my friend's house, using her computer

# We're all lazy

*(well most of us)*

- Clicking through legalese
- Giving away too much in order to get to something interesting
- Same user name/password on different sites
- We need help!

# Trends

- Use of email address as user identifier
  - Facebook, linkedin viadeo, ...
  - Easier for users to remember
  - And great for tracking users across sites ...
    - Single pixel GIF's are good for that too
- Single sign-on with OpenID
- Granting cross site access to your data
  - OAuth

# OpenID

- You are asked to type in an http URL to log in
  - Each user must have a web page
  - Requesting website gets this URL
    - Same tracking concerns as for email Ids
- You log in with your identify provider
  - Via browser redirection
- Your identity provider may allow you to set privacy preference for personal data it discloses on your behalf

# OAuth

- Avoid the need to give one website your account details (user name/password) when it needs to access your data on another site
  - e.g. Web printing service and separate photo site
- Printing service redirects your browser to the photo site for you to log in and grant rights for the printing service to access your photos
  - Server to server protocol magic
- Constrained access rights
  - Time and purpose limited

# Beyond OpenID?

*Privacy is more than Identity*

- How about only requiring users to disclose the URI for their privacy provider rather than themselves?
- Same browser redirection technique
  - Or use separate sandbox within webpage
- Your privacy provider helps you
  - When setting up a new account on a website
    - Independent advice
  - When logging into that website
  - When that website ask for personal details

# Privacy in the Digital Age

- Enabling users to negotiate data handling obligations with websites
  - What personal data is collected?
  - How long can it be held for?
  - What purposes can it be used for?
- P3P as first generation approach
  - What lessons can we learn from it?
- Research projects: Prime, PrimeLife
- Cryptographic credentials
  - Minimal disclosure of personal data

# Privacy Providers

- Social Network Providers are compromised by their business model
  - Seek to maximise what they know about you
    - Hard to find privacy policies!
- Privacy provider as independent 3<sup>rd</sup> party
  - What business models, though?
    - Subscription and slice of micropayments?
    - GlobalLockBox.com as sign of future?
- Relationship to web of personal sites?
  - Distributed SNS

# Partial Identities

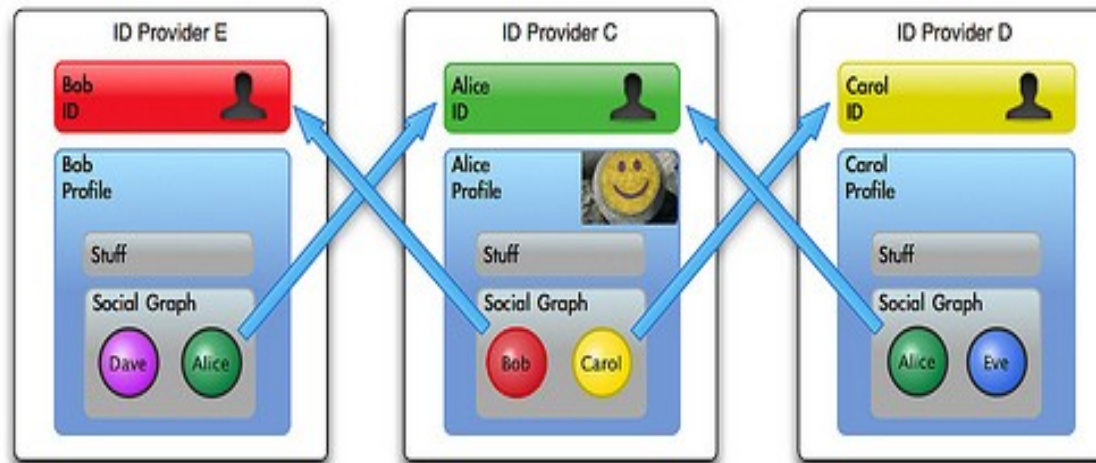
- How do you identify yourself on the Web?
  - Public vs Private identity
  - Social groups are often somewhere in between
    - Party photos that come back to haunt you
- Privacy provider can help
  - Making it easy for you to use a different identity on different sites
  - Or to have multiple identities on the same site
- Partial identity as URI

# Web Run-Times

- Execution environment for web apps
  - Mark-up, style sheets, scripts, etc.
- Browsers, Widgets, and now Websites
- Personalized apps that run 24x7 on your behalf
  - Combo of mark-up, style sheets scripts, etc.
  - UI as shareable widgets on web pages
  - Run somewhere in the Cloud
- Disruptive potential to displace centralized SNS

# Agents, Trust and Privacy

- How do you trust communicating agents to look after your privacy?
- Answer: use privacy providers to manage access control and data handling obligations



From Andrew Korth, <http://bit.ly/ONZZc>

# Eggs and Baskets

- Is it reasonable to trust a “privacy provider”?
- What are the alternatives?
- How usable are they?

# Switching providers

- What happens if a company goes bust?
- What happens if the jurisdiction it operates in becomes unfriendly to its citizens?
- Need to be able to transfer providers
- Hence need for standards!

# Context Awareness

# Context

- User preferences
- Sensory or cognitive impairments
- User's past behaviour
- Behaviour of others like you
- Variations across devices
- Changes in the environment
- Nomadic interfaces – where you dynamically switch from one device to another

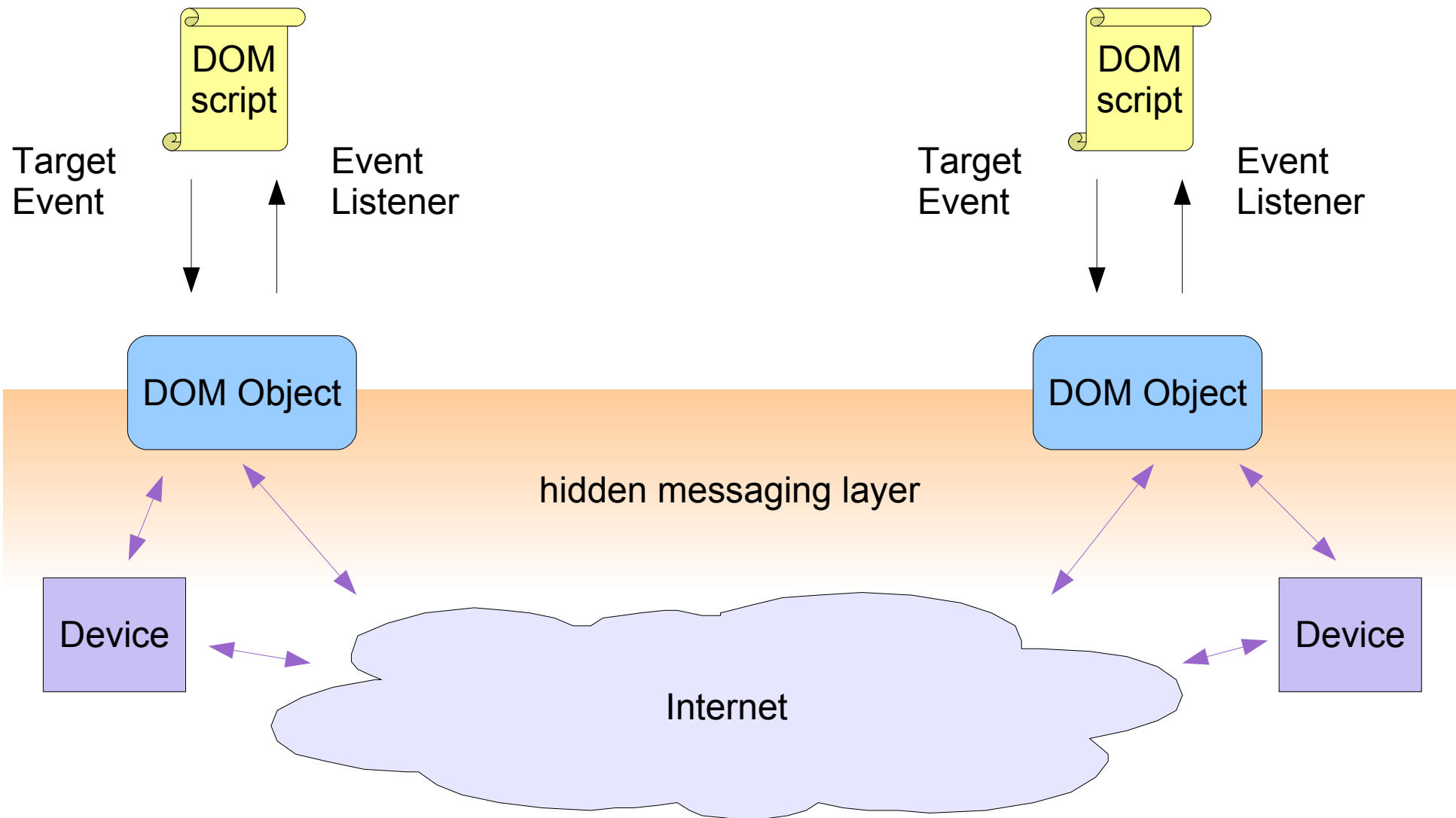
# Context in the Cloud

- Maintaining context descriptions and making them available to web applications and authoring tools
  - Model-based UI design & MBUI XG
  - Responding to changes at run-time
- Ontologies for sharing the underlying models
  - UWA WG's Delivery Context Ontology
  - Different APIs for different needs
- Privacy and Trust as key considerations

# The Web of Things

- Moore's law driving down cost of connecting things into the Cloud
  - Ubiquity of devices everywhere
    - Hundreds of microcontrollers in every home
- Extending the Web to real-world things
  - Web technologies as key to reducing costs
- Rich models of the real-world
  - Virtual objects in Web Run-Time as proxies for real world things
- **Lots of potential for Social Web of Things**

# Proxies for accessing services



# Discussion