User-Managed Access (UMA): Data-Sharing Power to the People

Eve Maler and Maciej Machulak
on behalf of and with thanks to the UMA Work Group
13 July 2011
Agenda

Short introduction: UMA concepts and benefits
Demo of UMA in action with the SMART system
How UMA works with OAuth under the hood
The UMA roadmap
Q&A
The “data price” for online service is too high (part 1)

- Provisioning by hand
- Provisioning by value
- Oversharing
- Lying!
The “data price” for online service is too high (part 2)

- Meaningless consent to unfavorable terms
- Painful, inconsistent, and messy access management
- Oversharing of lots of real information
Privacy is not about secrecy

"The goal of a flexible, user-centric identity management infrastructure must be to allow the user to quickly determine what information will be revealed to which parties and for what purposes, how trustworthy those parties are and how they will handle the information, and what the consequences of sharing their information will be”

– Ann Cavoukian, Information and Privacy Commissioner of Ontario, Privacy in the Clouds paper

It’s about context, control, choice, and respect
UMA enables you to manage sharing and protect access from a single hub.

I want to share this stuff selectively!
- Among my own apps
- With family and friends
- With organizations

I want to protect this stuff from being seen by everyone in the world!

Historical
Biographical
Reputation
Vocational
Artistic/user-generated
Social
Location/geolocation
Computational
Genealogical
Biological/health
Legal
...

http://tinyurl.com/umawg
UMA gives users a true digital footprint dashboard

Web 2.0 access control today is inconsistent and unsophisticated

You have to name known people in order to share with others

You have to keep rebuilding your “sharing circles”

You can’t “advertise” your content without giving it away

You can’t get a global view of all your sharing relationships

You can unify access control under one AM

Your AM can test for claims like “over 18”

You can reuse AM policies with multiple hosts

You can control access to stuff with public URLs

You can manage and revoke access from one place
UMA lets web apps easily offer “context, control, choice, and respect”

- You can provide sophisticated protection and sharing of any user content or data that isn’t meant to be fully public
- You can outsource the entire job to third parties (AMs)
- You can ensure that the protection of sensitive resources is stronger than the “private URL trick”
- You can build trust more readily with users who are “privacy fundamentalists”
- You can integrate these features using lightweight OAuth, JSON, HTTP, and REST paradigms and a freely implementable protocol
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The SMART project is...

- About “Student-Managed Access to Online Resources”
- Taking place at the School of Computing Science, Newcastle University
  - Affiliated with Centre for Cybercrime and Computer Security
  - Team members: Prof. Aad Van Moorsel, Maciej Machulak, Łukasz Moreń, Maciej Wolniak, Chris Franks, and Jacek Szpot
  - JISC-funded
- Planning to open-source its “UMA/j” implementation and sample apps
  - Already open-sourced its OAuth “Leeloo” implementation and contributed it to the Apache Amber project
- See: smartjisc.wordpress.com and @smartproject
SMARTAM 2.0 is in public beta: try it for yourself!

- Instructions are on the blog
- Visit gallerify.me and smartam.net to get started
SMART lets Alice share photos selectively with Bob.

The photo service Alice uses, with protected albums.

The service Bob uses to view photos owned by others (in this case, another instance of Gallerify.me).

Alice’s chosen AM.
Demo
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UMA’s history with OAuth

we’re right about here
The UMA players are really just enhanced OAuth players.

- think "resource owner"
- think "resource server"
- think "authz server"
- think "client"

Could be identical to resource owner or not.
OAuth 2.0 leaves unspecified how the two servers interact.
UMA has to make their communications interoperable
So UMA has three phases

1. Protect a resource
2. Get authorization
3. Access a resource
Phase 1: Protect a resource

- Alice introduces host and AM using OAuth
- Possibly with dynamic registration
- Host registers **sets of resources** to be protected and **available scopes** at AM host resource set registration endpoint
- Alice ensures AM knows her policies for sharing them
Working with resource set registration and scopes

- Scope URIs resolve to scope descriptions
- They can live anywhere
- Host registers resource sets and maps to available scopes
- Using RESTful API
(intermission)

- The requesting party learns about the resource... *somehow*
  - Emailed link?
  - Discovery service?
  - Microformat data on Alice’s blog?
- And it knows how to use the API and scopes at the host... *somehow*
  - Developer documentation?
  - Standardized scopes?
Phase 2: Get authorization

- Requester attempts access but has to get, in turn...
  - A token from AM requester token endpoint
  - Permission for sought-after scope from AM authorization endpoint
  - Likely providing claims to win permission
- Host uses AM token status endpoint to check each attempt by requester
- Host uses AM permission registration endpoint to register the sought-after scope
If Alice is also the requesting party...

- She has a “synchronous” authorization experience because the claim she must provide is that she’s Alice.

- Otherwise she doesn’t have to be around when access is tried.

- The flow would be the same for Alice, Bob, or anyone else who needs to prove they satisfy the policy.

- We are working on OpenID Connect integration for basic interoperable “trusted claims”.

Policy: alice@gmail.com can get to this calendar.
Phase 3: Access a resource

- The happy path
The UMA spec “call tree”
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Next steps organizationally

- The OAuth WG meeting at IETF81 in July will likely concentrate mostly on OAuth 2.0 completion
- Several new scoping items, including standardizing the authz server/resource server interface, have been brought up
  - We are working to socialize our proposed solutions
- We will keep fleshing out the spec (updating the oauth-umacore I-D)
  - We may proceed to a Kantara All-Member Ballot to try for Recommendation status as well
Next steps technically

- Open-sourcing of Java implementation behind SMARTAM (UMA/j)
- Also likely Python implementations of host and requester code
- New mobile implementations (Fraunhofer AISEC)
- Experimental deployments by a variety of “Personal Data Ecosystem” companies
- Solving the remaining hard problems for V1.0 and beyond, for example:
  - Profiles for trusted claims handling and OpenID Connect integration
  - Responding to specialized use cases – e.g., secure dynamic discovery and highest security for Project hData healthcare needs
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Thanks for joining us today

Become an UMAritarian!
Webinar recording will appear soon!

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