Role Management in a Privacy-Enhanced Collaborative Environment

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Agenda

Role Management

in a

Privacy-Enhanced

Collaborative Environment
Collaborative environments

- Relationship management
  - XING
  - LinkedIn
  - Facebook
  - studiVZ
  - Twitter

- Content sharing
  - delicious
  - YouTube
  - Scribd
  - SlideShare
  - Flickr
  - Google Docs & Spreadsheets

- Collaborative working
  - Mendeley

Anja Lorenz: "Roles in PCEs" at IADIS e-Society 2010, Porto

18.03.2010
Motivation for privacy-enhancement

Many spreaded personal data on web profiles for different reasons...
Web profiles of Katrin

- for research
- for professional networking
- for private networking
Web profiles of Anja

- for research
- for professional networking (@anjalorenz)
- for private networking
Motivation for privacy-enhancement

Things that may happen...
Motivation for privacy-enhancement

Motivation for privacy-enhancement

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http://pleaserobme.com/
Motivation for privacy-enhancement

Be careful with spreading personal data in the web!
Privacy-Enhancement
Protection in collaborative environments

The surrounding of each person is uniformly untrusted!

(Chaum 1995)
State-of-the-art
Technical approaches for privacy-enhancement

Encryption  Pseudonymisation  Anonymisation

Well-proved for sender-recipient relationships (e-Shops etc.)

But do not support requirements for privacy respecting collaborative working
Collaborative environments

Conditions for privacy protection

- No predefined protocols
- Ad-hoc decisions
- Spontaneous activities
- And interaction is a strongly wanted feature
Our approach:
Privacy enhanced identity management

Focus:
User Control
Privacy enhanced ID-management

Main concept: Partial identities

**Not:** showing whole profiles of one person

**But:** disclosing selected attributes of one person

→ partial identity
Privacy enhanced ID-management

Main concept: Partial identities

A partial identity (pID)
... „represents the person in a specific context or role."

• a subset of attributes
• union of all pIDs = complete identity
• credentials for proof-demanding attributes

(Pfitzmann & Hansen 2008, Chaum 1985)
The User decides which personal data is disclosed and to whom in what context!
Research Background
BluES, PRIME, BluES’n, Prime Life

https://www.prime-project.eu  http://www.primelife.eu/

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Research Background

BluES'n

Identity management
→ partial identities for user representation in certain contexts

Authentication & authorisation
→ based on anonymous credentials and policies

A privacy-enhanced collaborative environment for learning

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Research Background

BluES’n

A privacy-enhanced collaborative environment for learning

Social interaction vs. privacy requirements

- Intra-application partitioning (Borcea et al. 2005)
- Awareness information (cf. e.g. Franz et al. 2006)
- Reputation (Steinbrecher 2006)
- Roles
Understanding of Roles

Different interpretations

- **Position** (Linton 1936, Luhmann 1984)
- **Behaviour** (Gerhardt 1971)
- **Relations** (Mead 1967, Goffman 1974, Carell + 2002)
- **Groups** (Znaniecki 1965)
Understanding of Roles

Different usage

**Overall aim:** reducing management complexity

- Apply actions to a group of users
- Generate and support certain work settings
- Ease access control

Simple
(just Owner and Reader)

Role Based Access Control

Free and universal role management for complex scenarios
Role Concept for BluES’n

Our interpretation

**Roles** = stereotypes of users

- Equal rights and duties
- Expectations of behavior
- Help interaction partners to range in a user’s position within a group

(Lorenz 2009, Borcea-Pfitzmann 2008)
Role Concept for BluES’n
Our usage: 3 role dimensions

1. Administrative Roles

- Owner
- Guest
- Participant
Role Concept for BluES’n

Our usage: 3 role dimensions

1. Administrative Roles
2. Functional Roles

Teacher

Learner

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Role Concept for BluES‘n
Our usage: 3 role dimensions

1. Administrative Roles
2. Functional Roles
3. Group dynamic Roles

Creative
Motivator
Problem Solver
Brilliant!
Role Management for PECEs

Benefits regarding privacy issues

*Not:* disclose attributes of the pID

*But:* disclose attributes of the role

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Role Management for PECEs

Benefits regarding privacy issues

**Not:** centrally managed list of role holders

**But:** decentralisation by anonymous credentials for roles

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Role Management for PECEs

Benefits regarding privacy issues

**Not:** one role for each pID

**But:** n:m relationship of roles and pIDs
Role Management for PECEs

Remaining core problem

- Roles are **information** about users

Scenario: Only few users can hold teacher role

**Question:** What is the right context to switch to another pID?

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Role Management for PECEs

Approaches for automatic choice of pID

In BluES: **Decision suggestion module (DSM)**
- helps to select the appropriate pID according to preferences for the corresponding context

**Question:** What are relevant contexts for switching pIDs?

- Transactions?
- Roles?
- Interaction Partners?

→ No default way
  → Only advices by user’s preferences
Role Management for PECEs

Conclusions

• PECEs provide means to protect users‘ privacy, e.g. by partial identity management
  – Mission: keep pIDs unlinkable

• Flexible, decoupled role management allows to distribute roles onto several pIDs
  – Risk of linkability can be reduced but not removed
Thank you!

Questions?
References

1|2


References


Images

Joystick:  http://www.flickr.com/photos/beggs/103038447/
Dishes:  http://www.flickr.com/photos/starwarsblog/514453347/
Classroom:  http://www.flickr.com/photos/wolfra/2873071778