

SOCIAL NETWORKS BASED ON XMPP

PRIVACY AND DECENTRALITY

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OVERVIEW

I'M GOING TO TALK ABOUT...

- A Social Network idea based on XMPP and Semantic-Web technologies
- A prototype application to exchange tagged bookmarks with friends
- Why do we need (more) *privacy* in Social Networks?

WHAT IS A SOCIAL NETWORK?



WHAT IS A SOCIAL NETWORK?

SOME ASPECTS TO DEFINE THEM

- Buzzword, like Web 2.0
- Web based applications
 - accessible from everywhere
 - users needn't care about storage & backup
- Benefits from the friendship connection between users



WHAT IS A SOCIAL NETWORK?

WHAT DOES SOCIAL MEAN?

- Why do we call a network “social”?
- Is it social because it is written for the people? Unsure.
- It is social *because of* the people who use it.

WHAT IS A SOCIAL NETWORK?

HOW DIFFER THE USERS TODAY?

- Years ago, the Internet was only available to academics and used by technology-geeks
- Today, all kinds of people use the Internet
- Most users are not interested in technical details
- They want a simple application to express themselves and communicate with friends

They do not know about privacy implications

PRIVACY

THE FACEBOOK EXAMPLE

The Facebook logo, consisting of the word "facebook" in white lowercase letters on a dark blue rectangular background.

- Facebook's privacy policy:
 1. *You should have control over your personal information. Facebook helps you share information with your friends and people around you.*
- And the Terms of Service say:

*...you automatically grant [...] to the Company an **irrevocable, perpetual, non-exclusive, transferable, fully paid, worldwide license to use, copy, publicly perform, publicly display, reformat, translate, excerpt [...] such User Content for **any purpose, commercial, advertising** ...***

PRIVACY

WHAT INFORMATION CAN BE COLLECTED?

- 1 You tell your friends that you have a certain disease.
- 2 Facebook collects such information.
- 3 And sells it to insurance companies.
- 4 You don't get a health insurance.
- 5 Affects your children in case of genetic diseases.

CENSORSHIP

THE GOOGLE, YAHOO AND SKYPE EXAMPLE



- Mainly relevant for non-democratic countries
- Search results are censored (Google and Yahoo)
- Text messages are stored and censored (Skype)

PRIVACY AND CENSORSHIP

OUR GOAL

- Do we really have to use Facebook to tell news to our friends?
- Can we share information with friends without such centralized services?
- Can we protect our privacy in social networks?
- Can we prevent censorship?

THE CHALLENGE IS THE ARCHITECTURE!



XMPP decentral instant messaging service (since 1999)

PGP guarantees privacy, prevents eavesdropping and censorship (since 1991)

Can we use XMPP for a Social Network architecture?

WHAT DO WE WANT TO CHANGE?

- 1 Data must not be stored at a central place
- 2 Data exchange must be between friends only
- 3 Transmissions must be encrypted

The final application must be easy to use

DISTRIBUTED ARCHITECTURE



- XMPP as communication layer
- PGP encryption between friends
- Semantic-Web technologies for data exchange
FOAF, TagOntology, SPARQL

DISTRIBUTED ARCHITECTURE

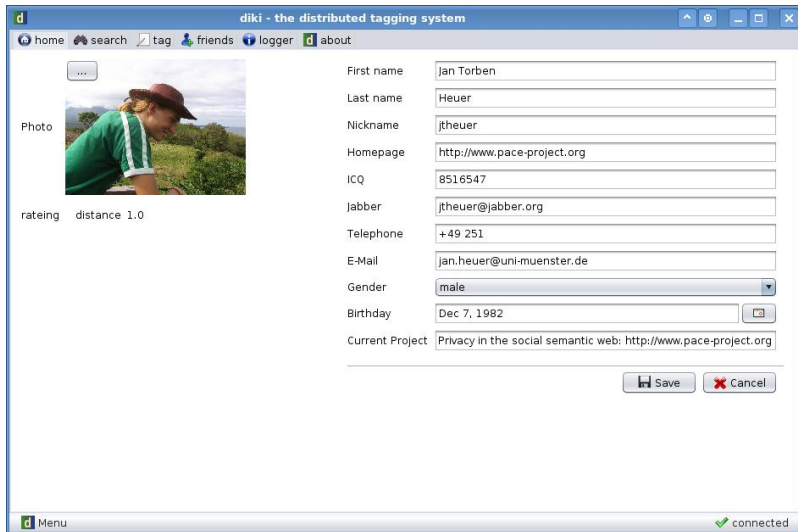
A SOCIAL NETWORK LIBRARY

- Application runs on the Desktop
- Communication over XMPP
- Local port to communicate with other software (webbrowser)
- Data are stored locally in an RDF Database
- Friends ask friends for certain information, not a central database

OUR APPLICATION

- Social bookmark sharing application
- Create a personal profile
- Create bookmarks and tag them
- Query your friends recursively for tagged bookmarks
- Import bookmarks from Delicious and Bibsonomy

CREATE A PROFILE

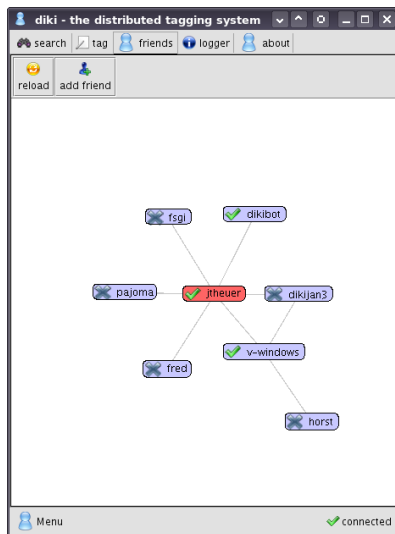


The screenshot shows a web browser window titled "diki - the distributed tagging system". The browser's address bar and navigation menu are visible. The main content area is a profile creation form. On the left, there is a photo of a person in a green shirt and a hat, with a "Photo" label and a "rating distance 1.0" below it. The form fields are as follows:

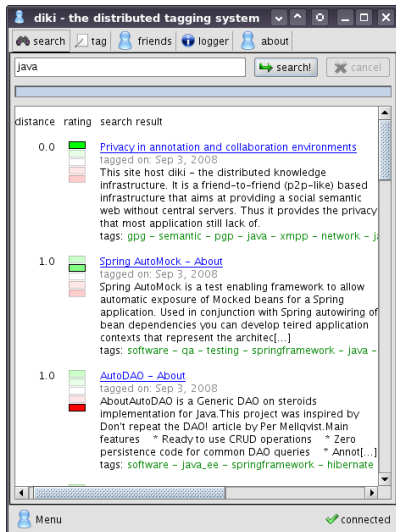
First name	<input type="text" value="Jan Torben"/>
Last name	<input type="text" value="Heuer"/>
Nickname	<input type="text" value="jtheuer"/>
Homepage	<input type="text" value="http://www.pace-project.org"/>
ICQ	<input type="text" value="8516547"/>
Jabber	<input type="text" value="jtheuer@jabber.org"/>
Telephone	<input type="text" value="+49 251"/>
E-Mail	<input type="text" value="jan.heuer@uni-muenster.de"/>
Gender	<input type="text" value="male"/>
Birthday	<input type="text" value="Dec 7, 1982"/>
Current Project	<input type="text" value="Privacy in the social semantic web: http://www.pace-project.org"/>

At the bottom right of the form, there are two buttons: "Save" and "Cancel". The "Save" button has a floppy disk icon, and the "Cancel" button has a red 'X' icon. In the bottom left corner of the browser window, there is a "Menu" button with a 'd' icon. In the bottom right corner, there is a "connected" status indicator with a green checkmark icon.

LINK WITH FRIENDS



SEARCH FOR FRIENDS' BOOKMARKS



The screenshot shows a web browser window titled "diki - the distributed tagging system". The navigation bar includes "search", "tag", "friends", "logger", and "about". A search input field contains the text "java" and has "search!" and "cancel" buttons. Below the search bar, the results are displayed in a table with columns for "distance", "rating", and "search result".

distance	rating	search result
0.0		Privacy in annotation and collaboration environments tagged on: Sep 3, 2008 This site host diki - the distributed knowledge infrastructure. It is a friend-to-friend (p2p-like) based infrastructure that aims at providing a social semantic web without central servers. Thus it provides the privacy that most application still lack of. tags: gpg - semantic - pgp - java - xmpp - network - j
1.0		Spring AutoMock - About tagged on: Sep 3, 2008 Spring AutoMock is a test enabling framework to allow automatic exposure of Mocked beans for a Spring application. Used in conjunction with Spring autowiring of bean dependencies you can develop teired application contexts that represent the architec[...] tags: software - qa - testing - springframework - java -
1.0		AutoDAO - About tagged on: Sep 3, 2008 AboutAutoDAO is a Generic DAO on steroids implementation for Java. This project was inspired by Don't repeat the DAO! article by Per Mellqvist. Main features * Ready to use CRUD operations * Zero persistence code for common DAO queries * Annot[...] tags: software - java_ee - springframework - hibernate

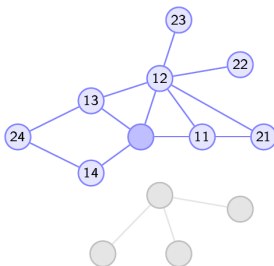
At the bottom of the window, there is a "Menu" button and a "connected" status indicator with a green checkmark.

SEARCH FOR FRIENDS' BOOKMARKS

- How can we find sufficient bookmarks with our application?
- Centralized Social Networks like Delicious know all available content.
- Our application can only ask friends.

RECURSIVE BOOKMARK SEARCH

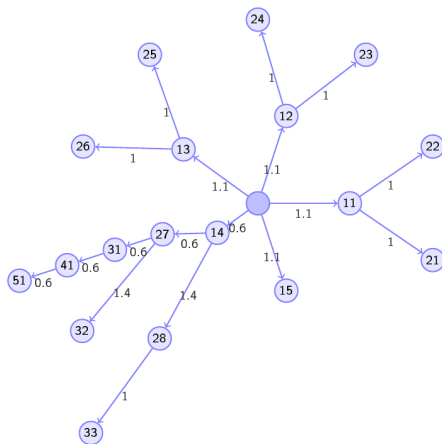
THE FRIENDS-GRAPH



- How can we traverse the graph in order to find results
- Friends forward bookmark searches to their friends
- Some parts of the graph will never be accessible

RECURSIVE BOOKMARK SEARCH

OPTIMIZATION



- Weight the link to friends based on prior feedback

CURRENT PROTOTYPE

- Java6 Webstart application
- Sesame RDF database
- Smack API
- prefuse.org visualization toolkit

WHAT'S NEXT?

- TWITTER:** Integrate a simple twitter client
- XEP-0060:** Publish-Subscribe, distribute encrypted private information
- LDAP:** Provide contact-information of friends to the local addressbook applications {Thunderbird, KMail, ...}

WHAT'S NEXT

INTEGRATE WITH OTHER SUCCESSFUL SOFTWARE

FIREFOX search & bookmark plugin

PIDGIN plugin to use an existing account and friends

CONCLUSION

- Distributed Social Networks based on XMPP are possible
- PGP encryption is mandatory but still not userfriendly
- Write a nicer GUI

More information on <http://www.pace-project.org>
You can contact me on mail <at> jtheuer <dot> de

Thank you for your attention!