FAKULTÄT FÜR !NFORMATIK
Faculty of Informatics

Diplomarbeitspräsentation

computer languages

Introducing the XVSM Micro-Room Framework

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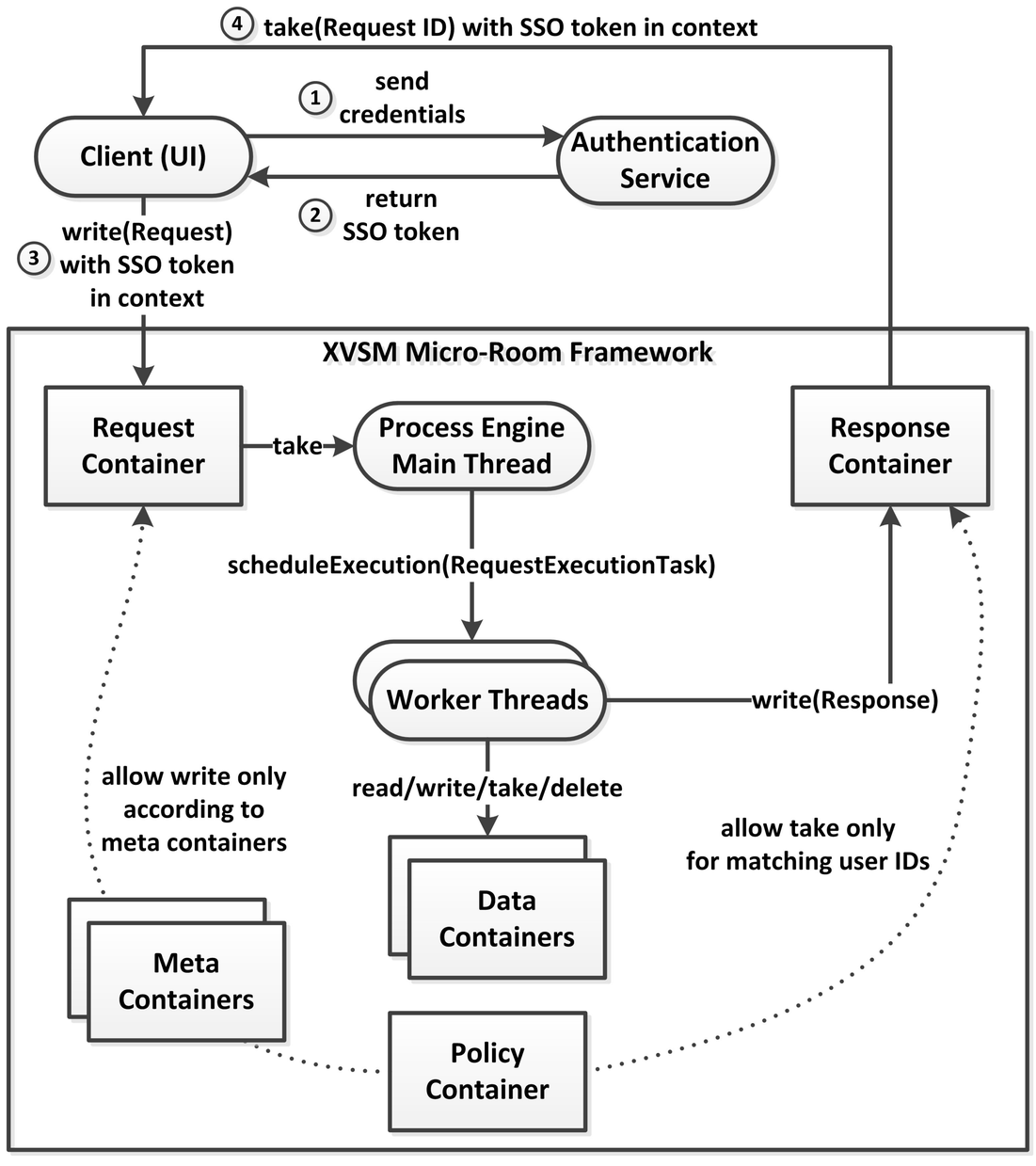
PROBLEM STATEMENT

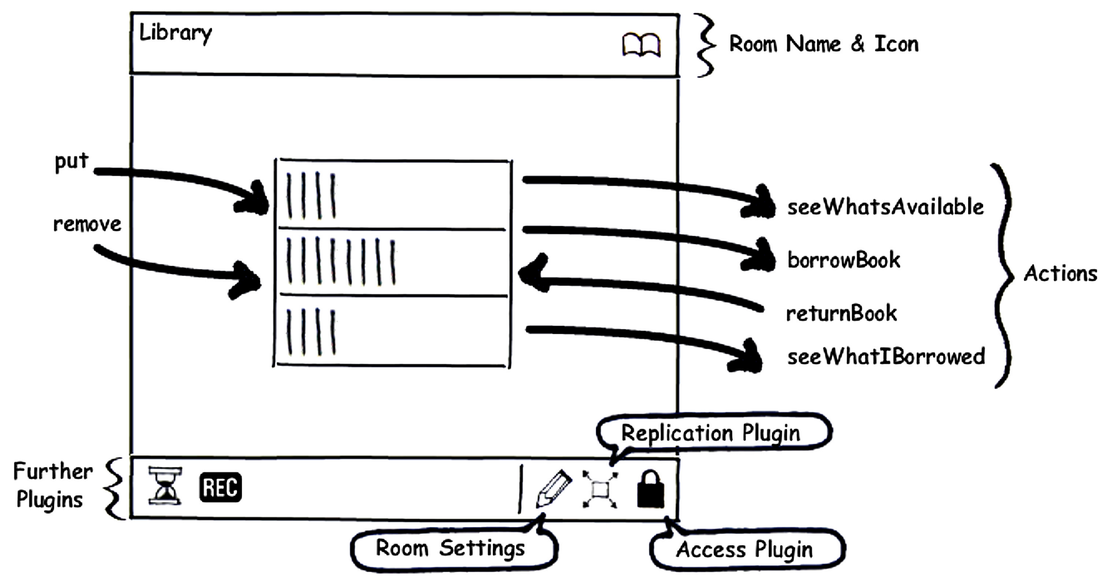
- Popular Online Social Networks (OSNs)...
  - are based on a client-server architecture
  - accumulate data at one location
  - allow their providers to misuse private data
- Privacy-preserving OSNs on the other hand...
  - are based on a peer-to-peer (P2P) architecture
  - prevent data accumulation
  - thus counter data misuse possibilities
- So everything is fine, right? Not quite...
- Those solutions have several drawbacks:
  - Many complex technologies
  - Bad extensibility
  - Uncommon user interface
  - A lack of other important privacy-related features
  - Insecure architecture

SOLUTION: THE XVSM MICRO-ROOM FRAMEWORK

- A high-level P2P framework
- Compensates the mentioned drawbacks
- Can create complex P2P applications in a declarative way by orchestrating Micro-Rooms
- Is used to create a proof-of-concept P2P OSN
- Uses eXtensible Virtual Shared Memory (XVSM)
  - A flexible space-based middleware (cf. [1])
  - Supports many of the different interaction patterns needed for P2P communication
- Also suitable for other deployment scenarios, e.g. in client-server, peer server or thin client environments
- Request handling is based on the secure service space concept (cf. [2])



WHAT IS A MICRO-ROOM?



- A shared data room providing a defined set of functionality
- Implementable by a plain Java class
- Configurable by simple XML files and further customizable by plugins
- Users interact with the room via pre-defined actions that can be...
  - configured with access restrictions
  - called by the user interface via a REST API

COMPARISON WITH OTHER SOLUTIONS

		Facebook	Diaspora	Mailbook	PeerSoN	Persona	Safebook	LifeSocial	Our P2P OSN
Functionality	Communication	✓	✓	✓	✓	✓	✓	✓	✓
	Collaboration	✗	✗	!	✗	✓	✗	✓	✓
	Availability	✓	✓	✓	!	✓	✓	✓	✓
Simplicity	Familiar UI	✓	✓	✗	!	✗	✓	✗	✓
	Easy deployment	✓	✗	!	✗	!	!	✓	✓
Extensibility	Plugin/Module support	✓	✗	✗	✗	✓	✗	✓	✓
Privacy	Protection against data abuse	✗	✗	✓	✓	✓	✓	✓	✓
	Fine-grained access restrictions	✓	!	!	✗	✓	✗	!	✓
	Assured deletion	✗	✓	✗	✗	!	!	✓	✓
	Knowledge about physical data distribution	!	!	✗	!	✗	!	✗	✓
Security	Protection against manipulated clients/requests	✓	!	!	✓	✓	✓	✓	✓

- We allow the usage of arbitrary technologies for user interface generation (e.g. HTML, C++, Java, ...) due to the REST API
- Our approach monitors the physical distribution of each data set and shows this information to the user to raise user awareness
- Summarizing, the XVSM Micro-Framework eases the creation of privacy-preserving P2P applications by providing valuable features

REFERENCES

- [1] Dönz T., 2011.
  Design and Implementation of the next Generation XVSM Framework. *Master's Thesis, Vienna University of Technology.*
- [2] Craß S., Dönz T., Joskowicz G., Kühn E., Marek A., 2012.
  Securing a Space-Based Service Architecture with Coordination-Driven Access Control. *Journal of Wireless Mobile Networks, Ubiquitous Computing and Dependable Applications.* 4(1):76-97.

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