Crypto-Book: Privacy Preserving Online Identities

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www.crypto-book.com

I. Overview

Cross-site authentication schemes mean users rely on social networking sites for their digital identities

Use of these identities brings privacy/tracking risks

We propose **Crypto-Book**

- extension to existing digital identity infrastructures
- offers privacy-preserving, digital identities
- uses *anytrust* servers [Wolinsky *et al.* EuroSec'12]
  - assign key pairs to a social identity
  - requires only one honest server for safety

Sign in with Facebook Sign in with Twitter

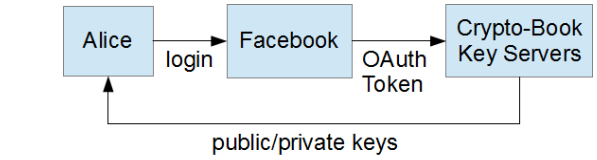
II. Example Use Case

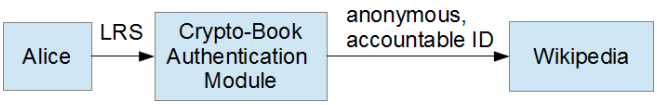
Alice wants to anonymously edit Wikipedia

Wikipedia thinks anonymous edits lead to vandalism

Crypto-Book provides an **anonymous, accountable ID** for Alice to log into Wikipedia

Wikipedia can block Alice's ID without deanonymizing her

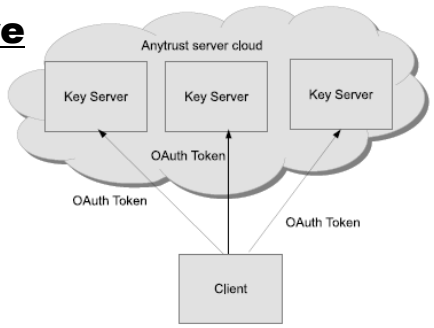




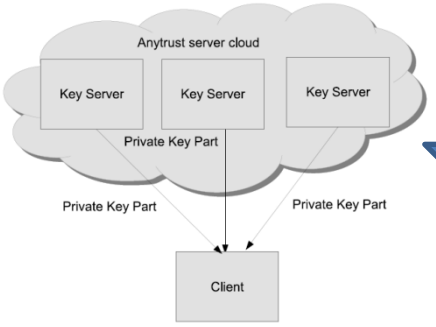
III. Our Architecture

Step 1: Client authenticates with Facebook

Goal	Strategy
Usable	Build on top of existing social networks
Resist dishonest key servers	Use anytrust cloud to *split trust* across servers
Privacy protecting	LRS cryptographically anonymizes users
Accountability	LRS ensures 1-to-1 mapping
Modular	Could easily use alternative • key assignment • anonymizing crypto



Step 2: Client sends OAuth token



Step 3: Key servers send private key to client

Step 4: Client makes linkable ring signature (LRS) with keys to authenticate to third parties