Policy-based Authentication and Authorization based on the **Layered Privacy Language**

LPL

- Machine-readable representation of Legal Privacy Policies
- Purpose-based Access Control
- Represexntation of Privacy-Preserving Methods
- Concept: Sticky Policies with Raw Data

Request

- Entity
- Purposes
- Data
- DataSources

Entity-Authentication

- Authenticate requesting Entity
- Agnostic of Authenti-cation Method

Purpose-Authorization

- Authorize requested Purposes against each Purpose of the LPL Policy for each Data Source

Entity-Authorization

- Authorize request-ing Entity against each Data Recipient of each relevant Purpose

Data-Authorization

- Authorize requested Data against each Data element of each autho-rized Purpose for each Data Source

→ POLICY-BASED AUTHENTICATION AND AUTHORIZATION

1 Requesting Entity Uni Passau authenticates ..... **2** Purpose research is valid .....
3 Requesting Entity Uni Passau authorized against Data Recipients ..... **4** Data age and postal-code authorize ..... **5** Data salary is invalid for 'Alice' ↴

LPL POLICY LPL1

- Purpose: research
- Data: age, postal-code
- Data Recipient: Uni Passau, TH Deggendorf

POLICY / DATA SOURCE / AGE / POSTAL-CODE / SALARY

lpl1	Alice	25	94032	36.000
lpl2	Bob	23	94469	35.500
lpl3	Charlie	24	18055	35.700

POLICY-BASED AUTHENTICATION AND AUTHORIZATION

AGE / POSTAL-CODE / SALARY

25	94032	–
23	94469	35.500

REQUEST

- Entity: Uni Passau
- Purpose: research
- Data: age, postal-code, salary
- Data Source: Alice, Bob

EXPERIMENT SETUP

Configu-ration · Dataset · Request

Policy-based Authentication and Authorization

Modul Execution Times

RESULT

Each of the benchmark parameters has maximal a linear effect on the execution time of the modules.

- Put all requested and inherited Purposes to the key-set ... < 1 ms
- Put the Data Sources to the relevant Purposes ..... 11 ms
- Getting all not relevant Purposes of the key-set ..... < 1 ms
- Remove all not relevant Purposes from the result map ..... < 1 ms
- Total execution time (cleaned) ..... ~ 11 ms

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