Knowledge Representation and Reasoning in IKS

Speakers:

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Try it

KReS working Demo at

http://150.146.88.63:9090/kres

http://bit.ly/9AjyEs

KReS now part of Stanbol Apache incubator

KReS is the semantic part of the semantic CMS stack for the IKS project

http://www.iks-project.eu

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KReS: main components

- **Ontology Network Manager (ONM)**
- **Rules & Inference (R&I)**
- **Semion**

Release as

- RESTful services
- Java API

Ontology Network Manager
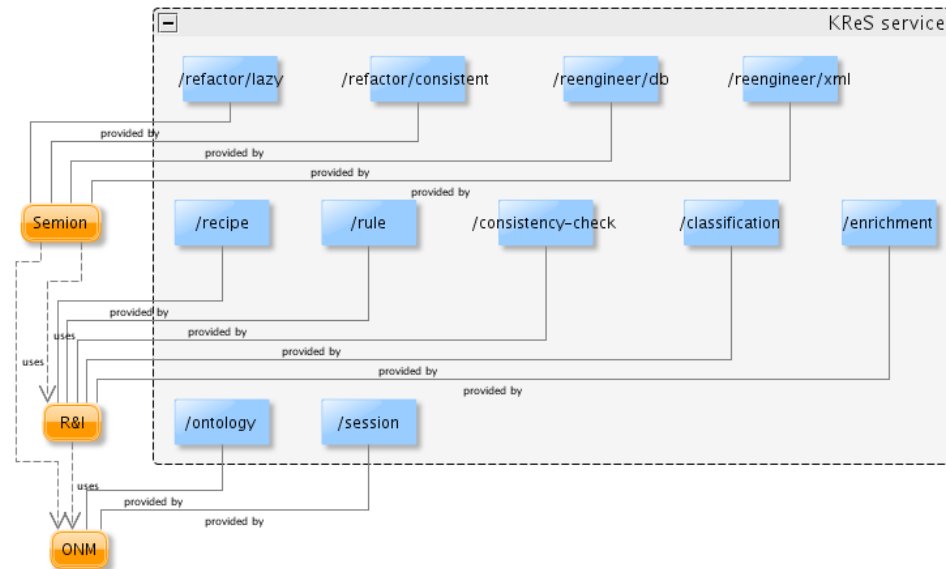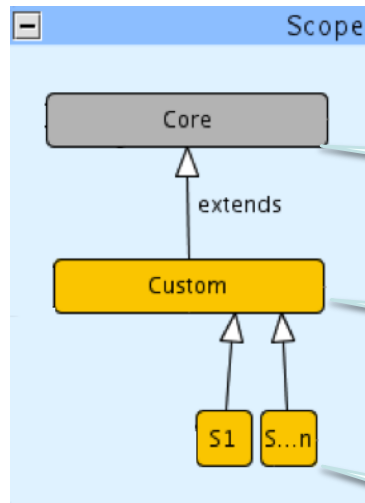
A scope contains (actually is) an ontology network and serves a specific purpose

IntegrityCheck Scope

Ontologies that are not changeable, shared with the other clients

DBpedia ontology

Ontologies that can be modified, shared with the other clients

Valid Content ontologies

Private session of a client e.g. for in-memory operations

DBpedia and GeoNames retrieved datasets

Scope

Core

extends

Custom

S1   S…n

Rules and Inference Manager

- ## Support for rules
  - ### Expressed in KReS syntax →SWRL compliant
  - ### Executed as SWRL or SPARQL
  - ### Can be executed on a specified scope
- ## Support for reusable rules through definition of recipes i.e. sets of rules
- ## Reasoning support
  - ### Through OWLink interfaces
  - ### HermiT built-in

Semion

- ## Reengineering
  - ### Transformation of non-RDF sources to RDF
  - ### Support for XML and relational DB

- ## Refactoring
  - ### RDF to RDF based on transformation patterns (recipes)
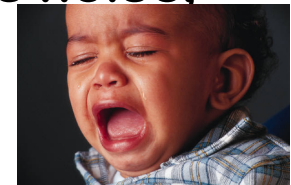
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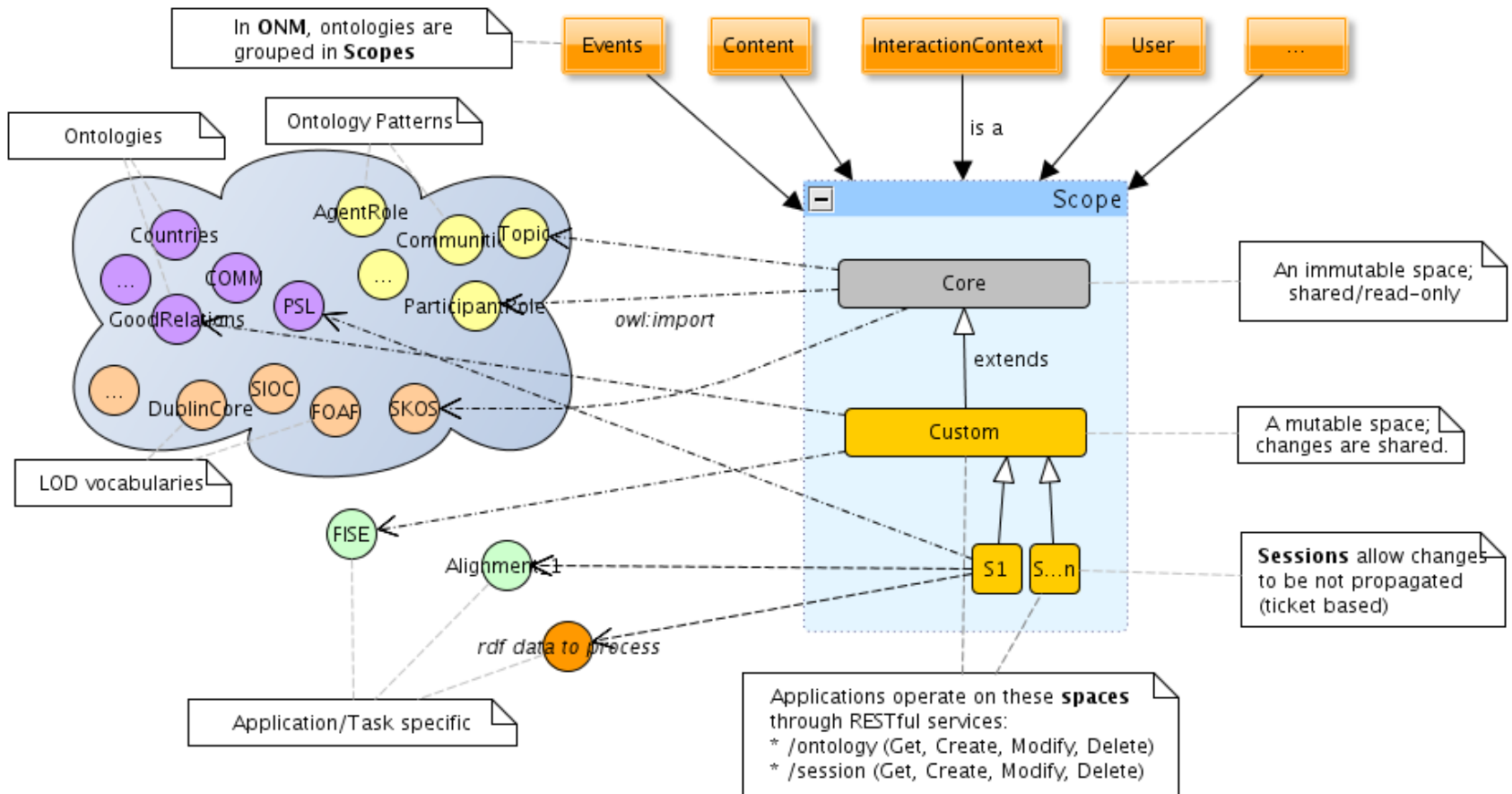
KReS and CMS developers
A user story by Nuxeo
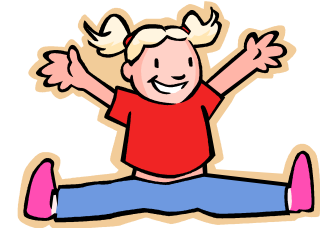
Lessons learnt so far

- The usage of a reasoner improves recall
  - Additional valid content retrieved (inferred knowledge vs. asserted knowledge)
  - sameAs entities are included in the results
- Reasoning based on linked data ontologies produces noise, hence
- External datasets e.g. LOD, need some cleaning
  - We will provide ontology patterns for improving reasoning results on DBpedia datasets
  - So called "washing machines" external services could be integrated for cleaning data e.g. datatype value format
- **Interesting research challenges in both stories**

KReS core: ONM

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In **R&I**, rules are grouped in **recipes**

Enhancement_Refactoring

Person-check

...

Recipe

is a

collects

Rule

Applications operate
through RESTful services:
* /recipe (Get, Create, Modify, Delete)
* /rule (Get, Create, Modify, Delete)

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RDF Data

includes

Input

User

Person-check

RDF Data
* Posted file
* Dereferencable URI
* Stored Graph URI

Reference to a Scope

Reference to a Recipe

Inference engine

| Consistency check | Classification | Enrichment |

RESTful services
* /consistency-check
* /classification
* /enrichment

Output

RDF Data
* Returned to the caller
* Stored in Graph

KReS: Semion refactoring

KReS: Semion reengineering

KReS services

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