A Reasoning Broker Framework for OWL

October 23, 2009

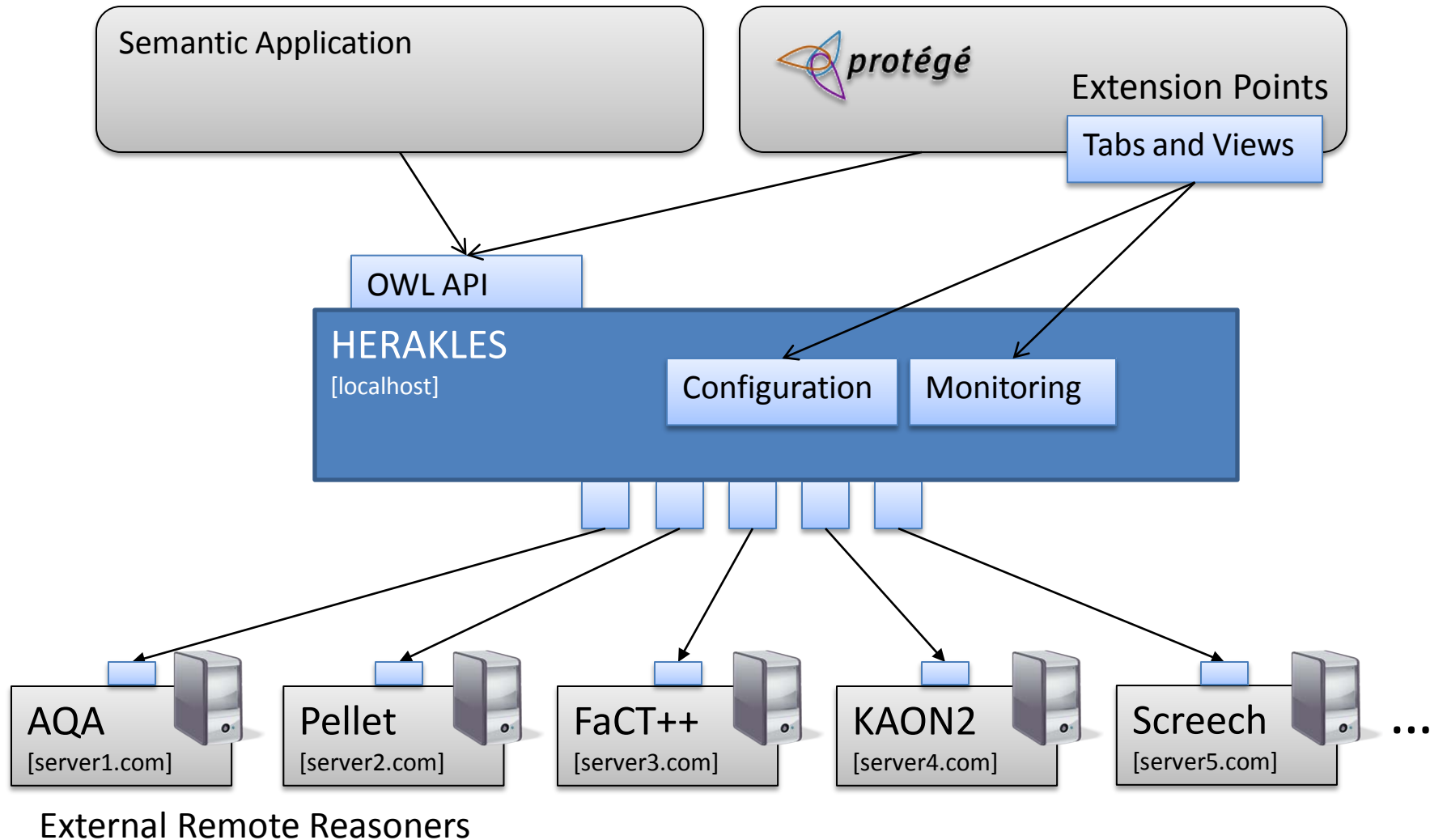Jürgen Bock
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- Different requirements of semantic applications
  - Ontologies (size, expressivity)
  - Reasoning tasks
  - Stream / sequence of queries
  - Concurrent reasoning requests
  - …
- Reasoning systems for OWL
  - Pellet, FaCT++, RacerPro, KAON2, HermiT, CEL, …, Screech, AQA
  - Different strengths and weaknesses
  - Different language expressivity

- How to match these requirements effectively and efficiently using existing reasoners?

Semantic Application

protégé

Extension Points

Tabs and Views

OWL API

HERAKLES
[localhost]

Configuration

Monitoring

AQA
[server1.com]

Pellet
[server2.com]

FaCT++
[server3.com]

KAON2
[server4.com]

Screech
[server5.com]

...

External Remote Reasoners

Query Stream Experiment

- Quick answering of a sequence of queries on a stable ontology.
- In this experiment:
  - Wine ontology
  - 100 random queries
  - 3 Reasoners
    - Pellet
    - FaCT++
    - KAON2
    - *All*
  - Simple (fault tolerant) parallelisation strategy

Runtime comparison of reasoners in the reasoning broker framework
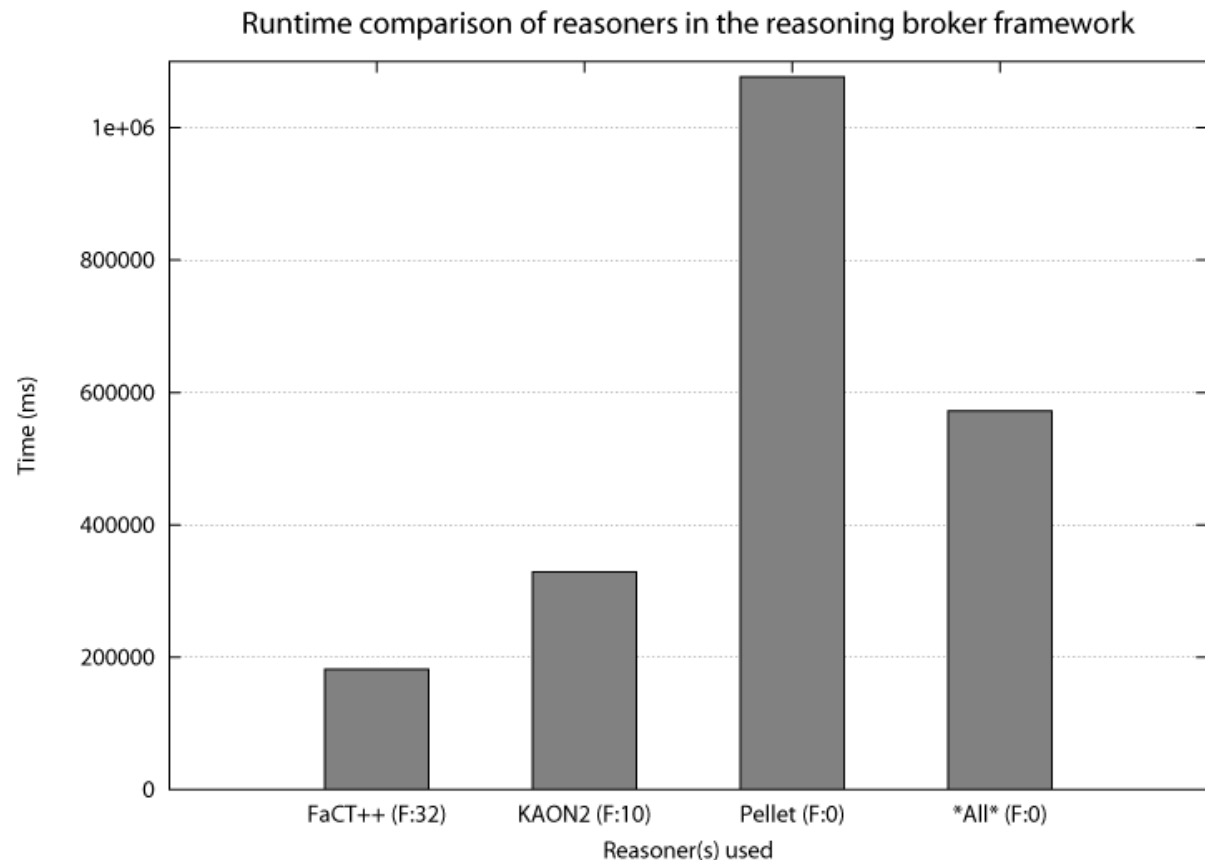
Summary

- HERAKLES reasoning broker framework for OWL
- Controlled delegation of reasoning requests to various external remote reasoners
- Behaviour controlled by broker strategies
  - Parallelisation
  - Selection
  - Partitioning (planned)
  - Anytime reasoning (currently by approximation)
- Protégé plug-in
- Integration
  - OWL API
  - OWLlink (planned)

http://herakles.sourceforge.net

Thanks for your attention!