Jena rules experiences and implications for rule use cases

Dave Reynolds
HP Laboratories

© 2004 Hewlett-Packard Development Company, L.P.
The information contained herein is subject to change without notice

Framing

- Focus on rule languages for the semantic web
- Based on experience with Jena rules system look at:
  - spectrum of use cases noticed
  - inferred need for standards-based interoperability
  - implications for expressivity of rules language

Copyright © 2003 HP corporate presentation. All rights reserved.

Jena rules experiences

Jena rules:

- forward chaining (RETE) and back chaining (tabled LP) rules engines, targeted at RDF processing
- internal usage (RDFS, partial OWL) and user tool
- Jena user base ~20k, rules introduced mid 2003

Observations from user group traffic and HP usage:

- significant usage, split between standalone RDF processing and rules layered on top of RDFS/OWL
- use of procedural extensions
- little evidence of rule interchange other than reuse of supplied RDFS/OWL rules
- wide mix of apparent use cases …

Copyright © 2003 HP corporate presentation. All rights reserved.

Use cases noted: 1. Deductive rule usage

Use case	Interoperability?	Expressivity implications
view transformation, abstraction and integration	•share transform libraries	•semi-positive •object introduction •property variables •(recursive data structures)
implementing semantics of shared vocabularies e.g. SKOS	•reuse of implementations •definition of agreed subsets?	•equality
application specific semantics	•tool independence •endorsement of approach	
expressive KR on top of/along side RDFS/OWL	•reuse of expressive KBs	•full OWL semantics or layering? •wf negation?

Copyright © 2003 HP corporate presentation. All rights reserved.

Use cases noted:
2. Integrity rule usage

Use case	Interoperability?	Expressivity implications
validation of dataset prior to further processing	•publish agent preconditions	•semi-positive •denial rules or reporting actions
Policy expression (e.g. access control)	•unclear	•richer reporting actions •non-monotonicity?

Copyright © 2003 HP corporate presentation. All rights reserved.

Use cases noted:
3. Reactive rule usage

Use case	Interoperability?	Expressivity implications
Event triggering (e.g. fault detection, SLA violation)	• unclear	
Notification	• public subscription interface	• non-recursive could simply be a persistent SPARQL query

Copyright © 2003 HP corporate presentation. All rights reserved.

Conclusions

- Significant usage of rule processing already in semantic web apps:
  - indirect reason for standardisation (tool independence)
- Example areas with particular interop needs:
  - transformation libraries
  - shared implementation of vocabularies (OWL fragments, SKOS)
  - pre/post condition for remote processors (e.g. semweb services)
  - (more expressive KR)
- Expressivity observations
  - need for RDF level processing (no DL restrictions, property variables, bNode introduction)
  - several interop use cases exploit closed-world negation
    is semi-positive sufficient or do we need full non-mon NAF?

Copyright © 2003 HP corporate presentation. All rights reserved.


invent