

Semantic Web Rule Language

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Outline

- Intro
- Rule systems
- SWRL
- A tiny example
- A bigger example (with “code”)

Intro

- Motivation: Automated use of rules on ontologies
- Solution: Rule Systems

Rule systems

- If A is true B must also be true ($A \rightarrow B$)
- Horn Clauses
 - Conjunctions implies
- Logical programming languages (Prolog ++)
- Rule languages (SWRL ++)
- Rule engines (HermiT ++)

Semantic Web Rule Language (SWRL)

- Developed in 2003
- Extends OWL (specifically the *rule axioms*)
- Uses URI for ID, keeping in compatible with RDF
- Created in collaboration with RuleML
- Open world assumption and universal quantification

Quick example

Company(Aker), Employee(Stian), Resource(AkerIntranett), (Person worksAt Company), (Person hasAccessTo Resource)

RDF: (Stian hasAccessTo AkerIntraNett), not very general.

SWRL: Employee(?x), worksAt(?x, Aker) → hasAccessTo(?x, AkerIntranett),
super duper general and readable

SWRL as RuleML, not so readable (for us)

```
<!-- hasParent(?x1,?x2) ^ hasBrother(?x2, ?x3) → hasUncle(?x1,?x3) --!>
<ruleml:imp>
  <ruleml:body>
    <swrlx:individualPropertyAtom swrlx:property="hasParent">
      <ruleml:var>x1</ruleml:var>
      <ruleml:var>x2</ruleml:var>
    </swrlx:individualPropertyAtom>
    <swrlx:individualPropertyAtom swrlx:property="hasBrother">
      <ruleml:var>x2</ruleml:var>
      <ruleml:var>x3</ruleml:var>
    </swrlx:individualPropertyAtom>
  </ruleml:body>
  <ruleml:head>
    <swrlx:individualPropertyAtom swrlx:property="hasUncle">
      <ruleml:var>x1</ruleml:var>
      <ruleml:var>x3</ruleml:var>
    </swrlx:individualPropertyAtom>
  </ruleml:head>
</ruleml:imp>
```

A more thorough example

