Deliberation RuleML 1.01 Specification and MYNG 1.01 Technology

Harold Boley, Tara Athan

The 8th International Web Rule Symposium (RuleML 2014)
August 18-20, 2014, Prague, Czech Republic
Point of Departure: RuleML 1.0 Hierarchy
Point of Departure: RuleML 1.0 Hierarchy

See: Rules, Events and Actions
Keynote as well as Reaction
RuleML 1.0 Demo
Deliberation RuleML 1.0: Language lattice retains unnecessary ‘hierarchical restrictions’ to modularity

- Example: Only Hornlog and ‘up’, not Datalog, allow <Or> in the <then> parts, so Disjunctive Datalog rulebases cannot be validated precisely (only be ‘underspecified’ as Disjunctive Hornlog)

Deliberation RuleML 1.01: Language lattice has less hierarchical, finer-grained modularity

- Example: allows <Or> in all <then> parts, e.g. for precise validation of Disjunctive Datalog
Finer Delib RuleML Modularization: Rule Instance

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-model href="http://deliberation.ruleml.org/1.01/relaxng/disdatalog_min_relaxed.rnc"?>
<RuleML xmlns="http://ruleml.org/spec">
  <Assert>
    <Forall>
      <Var>x</Var>
      <Implies>
        <if>
          <Atom>
            <Rel>integer</Rel>
            <Var>x</Var>
          </Atom>
        </if>
        <then>
          <Or>
            <Atom>
              <Rel>even</Rel>
              <Var>x</Var>
            </Atom>
            <Atom>
              <Rel>odd</Rel>
              <Var>x</Var>
            </Atom>
          </Or>
        </then>
      </Implies>
    </Forall>
  </Assert>
</RuleML>
```
Deliberation RuleML 1.01 Features: 

Datalog Extensions Yield Datalog$^+$

- **Existential Rules**, where the <then> part of a rule has existentially quantified variables, as needed for DL (e.g. OWL), F-logic, PSOA RuleML, Rule-Based Data Access (RBDA), etc.

- **Equality Rules**, where the <then> part of a rule is the <Equal> predicate, as needed for user-defined/'semantic' equality in logics with equality and functional logic programming (this was already allowed in RuleML 1.0)

- **Integrity Rules**, where the <then> part of a rule is falsity, as a convenient way to express negative integrity constraints
Delib RuleML 1.01 Orthogonality: *Hornlog* Extensions Yield *Hornlog*\(^+\)

- Because of modular schema design, all new features of Delib RuleML 1.01 **freely combinable**, via module inclusion,
  - with each other
  - with existing RuleML sublanguages
- Features available for other logics in Delib RuleML, including *Horn* logic (*Hornlog* RuleML 1.01), e.g. for *Hornlog*\(^+\) combo of
  - *Hornlog* Existential Rules
  - *Hornlog* Equality Rules
  - *Hornlog* Integrity Rules
Configure Your Own RuleML Language from Over 6 Billion via 2 MYNG Pages

- Delib RuleML 1.01 schemas customized by MYNG
- Key new **MYNG 1.01 technology** includes
  - Integration of new Relax NG schema modules – and RuleML sublanguages they define – into MYNG, e.g.
    - Datalog⁺, Hornlog⁺, and their many extensions
  - Improved functionality of the MYNG GUI and REST interface, e.g.
    - GUI access to automatically generated monolithic XSD schemas that are compatible with XML tools, e.g. JAXB
    - Myng-code display and URL access

See: **MYNG 1.01 Challenge Demo**
RuleML Community: Getting Involved

- Talk to RuleML colleagues during RuleML 2014
- Tutorial introduction ([http://ruleml.org/papers/Primer](http://ruleml.org/papers/Primer))
- RuleML MediaWiki ([http://wiki.ruleml.org](http://wiki.ruleml.org))
  - Includes the [Wiki Issue](http://wiki.ruleml.org) system for users to request [enhancements](http://wiki.ruleml.org) and report [errata](http://wiki.ruleml.org)
- RuleML Blog & Social Mediazine ([http://blog.ruleml.org](http://blog.ruleml.org))
  - Enabled [Public Review](http://blog.ruleml.org) of Deliberation RuleML 1.01
  - Has become a resource in its own right (courtesy to [Binarypark](http://ruleml.org))
- RuleML sources hosted on Github ([https://github.com/RuleML](https://github.com/RuleML))
New RuleML Use Cases

- Deliberation RuleML 1.0
  - See: [Geosocial SPLIS Talk](#)

- Deliberation RuleML 1.01
  - **Business Scenario Rules**
  - See: [Rulebase Competition 2014 Demos](#)
    - Geospatial Rules RCC
    - Offshore Holding Analytics
    - UServ Product Derby Case Study

- Simplified RuleML 1.01 presentation syntax
  - See: [RBDA/ΔForest Talk](#)
RuleML Version Roadmap

- RuleML 1.0
  - Specification of Reaction RuleML 1.0 is released
- RuleML 1.01
  - Specification of Deliberation RuleML 1.01 is released
- RuleML 1.02
  - Deliberation RuleML 1.02 is in preparation (Timeline), with focus on improving existing features
- RuleML 1.03 is being designed, with focus on adding new features
The specification of Deliberation RuleML 1.01 has been released after the Public Review and after the Steering Committee Response has addressed all comments. The full, fine-grained systematics of Delib RuleML 1.01 language features can be customized via MYNG 1.01. You can now start building Delib RuleML 1.01 Rulebases of your own, e.g. modeled on the instructive example or the entries of the Rulebase Competition 2014.

(http://blog.ruleml.org/post/2a4779af-297e-4455-b7bf-af371576a884)
Backup Slides
Preview: MYNG 1.01 Challenge Demo
Delib RuleML 1.01 Sublanguages Customized by MYNG 1.01 as Relax NG Schemas (1)
Delib RuleML 1.01 Sublanguages Customized by MYNG 1.01 as Relax NG Schemas (2)

**Quantification Options** (Check Zero or More)
- Implicit Closure
- Slotted Rest Variables
- Positional Rest Variables

**Expression Options** (Check Zero or More)
- Generalized Lists
- Set-valued Expressions
- Interpreted Expressions

**Serialization Options** (Check Zero or More)
- Unordered Groups
- Stripe-Skipping
- Explicit Datatyping
- Schema Location Attribute

**Treatment of Attributes With Default Values** (Select One)
- Required to be Absent
- Required to be Present
- Optional

**Language** (Select One)
- English Abbreviated Names
- English Long Names
- French Long Names

Relax NG Schema URL = http://deliberation.ruleml.org/1.01/relaxng/schema_rnc.php?backbone=x3f&default=x7&termseq=x7&lng=x1&propo=x3ff&implies=x7f&terms=xf3f&quart=x7&expr=xf&serial=xf
XSD Anchor Schema URL = http://deliberation.ruleml.org/1.01/xsd/naffologeq.xsd

**Usage**

The RNC and XSD Schema URLs may be used directly for online validation - copy and paste as required by the validator. For a demonstration of RNC validation using the online service Validator.nu, see [How to Validate with the RuleML Parameterized Relax NG Schema](#). Some scripts and processing instructions may require that the character "&" be replaced by "&amp;".