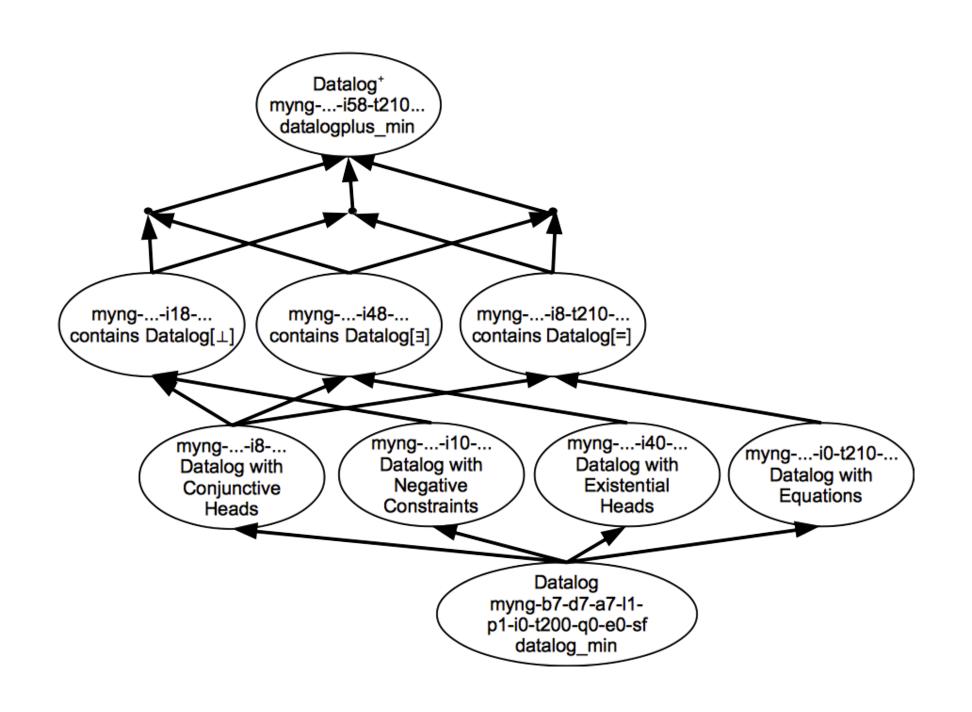
## **MYNG of Deliberation RuleML 1.01 Demo**

## From RuleML Wiki

This page (http://wiki.ruleml.org/index.php/MYNG\_of\_Deliberation\_RuleML\_1.01\_Demo) provides a quick demonstration of MYNG for customizing sublanguages of Deliberation RuleML 1.01 . Key new features include:

- Integration of new Relax NG schema modules -- and the RuleML sublanguages they define -- into MYNG, e.g.
  - Datalog<sup>+</sup>, Hornlog<sup>+</sup>, 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.
  - Display of myng-code and myng-code-based schema URLs.





## **Contents**

- 1 Quick Tour of the GUI
- 2 Configuring a Custom Relax NG Schema
- 3 Usage of Customized Schemas
- 4 References

## 1 Quick Tour of the GUI

- Open the MYNG GUI at http://deliberation.ruleml.org/1.01/myng.
- The selection form opens with the supremum language selected:
  - Clicking the Reset Form button will always return to this selection.
  - The RNC field gives the myng-code for this language (myng-b3f-d7-a7-l1-p3ff-i7f-tf3f-q7-ef-sf).
  - The XSD field gives the name of the best approximating anchor language for the selected language (naffologeq).
  - The two rows of five boxes with blue backgrounds group the configuration options into semantically-related facets, which will be discussed in greater detail below.



## MYNG GUI Starting View Supremum Deliberation RuleML

## MYNG 1.01 - the Deliberation RuleML Schema Selection Form

## Instructions

Make selections from the form below. Click to Download the generated RNC schema or an approximating XSD anchor schema. To view the Relax NG driver schema, click "Generate Schema", then scroll down. To reset the form to the default (supremum) values, click "Reset Form".



Reset Form | Generate Schema | Download RNC Schema | Download XSD Anchor Schema

RNC: myng-b3f-d7-a7-l1-p3ff-i7f-tf3f-q7-ef-sf

XSD: naffologeq

## Expressivity "Backbone" (Select One)

- Atomic Formulas
- Ground Fact
- Ground Logic
- Datalog
- Horn Logic
- Full First-Order Logic

## Propositional Options

(Check Zero or More)

- ✓ IRIs
- Rulebases
- Entailments
- Degree of Uncertainty
- Strong Negation
- ✓ Weak Negation (Negation as Failure)
- Node Identifiers
- ☑ In-Place Annotation
- XML base
- XML id

## Implication Options

(Check Zero or More)

- ☑ Inference Direction
- ✓ Non-Material
- Conjunctive Heads
- Negative Constraints
- Disjunctive Heads
- Existential Heads

## Term Sequences: Number of Terms (Select One)

- None
- Unary (Zero or One)
- Binary (Zero or Two)
- Unary/Binary (Zero to Two)
- Polvadic (Zero or More)

## Term Options

(Check Zero or More)

- Object Identifiers
- Slots
- ✓ Slot Cardinality
- Slot Weight
- Equations
- Oriented Equations
- ☑ Term Typing
- Data Terms
- ✓ Skolem Constants
- Reified Terms

## Ouantification 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
- 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&quant=x7&expr=xf&

XSD Anchor Schema URL = http://deliberation.ruleml.org/1.01/xsd/naffologeq.xsd

- Below the facets, two URLs are given
  - 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&quant=x7&expr=xf&serial=xf

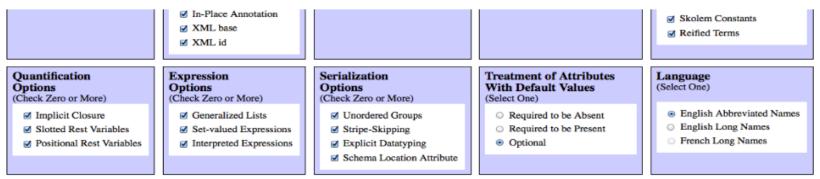
This is the MYNG REST call with query string to obtain the driver schema corresponding to the selections, which can also by reached using the myng-code (http://deliberation.ruleml.org/1.01/relaxng#myng-code) URL http://deliberation.ruleml.org/1.01/myng-b3f-d7-a7-l1-p3ff-i7f-tf3f-q7-ef-sf.rnc .

- XSD Anchor Schema URL = http://deliberation.ruleml.org/1.01/xsd/naffologeq.xsd This is the URL for the monolithic XSD schema of the anchor language naffologeq.
- Clicking the Generate Schema button initiates a request to the MYNG REST interface which produces a copy of the Relax NG Schema at the bottom of the page.
- Buttons are also available for downloading the indicated RNC and XSD schemas.



## Scroll Down in the MYNG GUI

## Usage and Schema Driver



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&quant=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 "&".

Clicking on the "Download RNC Schema" button downloads a copy of the schema driver into a file named according to the text labelled "RNC". To use the schema driver locally (offline), a local copy of the modules directory is also necessary - for download instructions, see the <u>Deliberation RuleML 1.01 Relax NG Directory</u>. For more information about the re-engineering of RuleML into Relax NG, which made this modularization possible, see the <u>MYNG</u> page on the RuleML Wiki.

## Schema Driver

```
# GET parameter: backbone=x3f
# GET parameter: default-x7
# GET parameter: termseq=x7
# GET parameter: lng=x1
# GET parameter: propo=x3ff
# GET parameter: implies=x7f
# GET parameter: terms=xf3f
# GET parameter: quant=x7
# GET parameter: expr=xf
# GET parameter: serial=xf
namespace dc = "http://purl.org/dc/elements/1.1/"
namespace dcterms = "http://purl.org/dc/terms/"
namespace ruleml = "http://ruleml.org/spec"
dc:title [ "Deliberation RuleML Custom-Built Schema" ]
dc:version [ "1.01" ]
dc:creator [ "Tara Athan (taraathan AT gmail.com)" ]
dc:subject [ "Deliberation RuleML, custom-built" ]
      "custom-built main module for a Deliberation RuleML sublanguage."
dc:date [ "2014-08-02T17:24:23-04:00" ]
dc:language [ "en" ]
dcterms:rights [ "TBD"
dc:relation [ "http://deliberation.ruleml.org/1.01" ]
```

## 2 Configuring a Custom Relax NG Schema

We will configure the RuleML sublanguage called "disdatalogplus\_mid". Its features include Disjunctive Rules ("dis"), Datalog expressivity ("datalog"), Conjunctive Rules, Existential Rules, and Equality ("plus"), and an assortment of Deliberation RuleML extras such as reification and annotation ("\_mid").

- Expressivity Backbone:
  - This is a radio button input where we Select One Expressivity Level.

■ For this example, we select the Datalog level of expressivity: corresponding to function-free Horn Logic.

- Also all the Expression Options (second row of facets) become disabled, because Datalog is function-free, so expression options are irrelevant.
- Notice that the "b" (backbone) and "e" (expressions) components of the myng-code change.
- Notice that the anchor language changes to "nafnegdishornlogplus". This is not an exact approximation.

Selection of Expressivity Datalog

The second of Expressivity Dat

## Selection of Expressivity

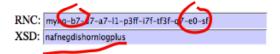
## **Datalog**

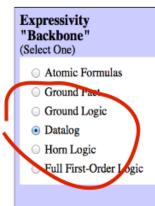
**Reset Form** 

Generate Schema

Download RNC Schema

**Download XSD Anchor Schema** 





# Propositional Options (Check Zero or More) IRIs Rulebases Entailments Degree of Uncertainty Strong Negation Weak Negation (Negation as Failure) Node Identifiers In-Place Annotation XML base XML id

## Implication Options (Check Zero or More) Equivalences Inference Direction Non-Material Conjunctive Heads Negative Constraints Disjunctive Heads Existential Heads

## Term Sequences: Number of Terms (Select One) None Unary (Zero or One) Binary (Zero or Two) Unary/Binary (Zero to Two) Polyadic (Zero or More) Term Option (Check Z

Term Optio	
₫ (	bject Identifiers
✓ S	lots
✓	Slot Cardinality
₹	Slot Weight
<b></b> ■ E	quations
₹	Oriented Equations
<b></b> ✓ T	erm Typing
₫ D	Data Terms
✓ S	kolem Constants
✓ R	teified Terms
	once tonis

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

Options (Check Zero or More)
☑ Unordered Groups
Stripe-Skipping
<ul> <li>Explicit Datatyping</li> </ul>
Schema Location Attribute

Serialization

Treatment of Attributes With Default Values (Select One)
<ul><li>Required to be Absent</li><li>Required to be Present</li><li>Optional</li></ul>

Language (Select One)
<ul> <li>English Abbreviated Names</li> </ul>
<ul> <li>English Long Names</li> </ul>
<ul> <li>French Long Names</li> </ul>

- Propositional Options:
  - Let's disable the Degree of Uncertainty option, which is only needed for Fuzzy Logic.
  - We'll also disable Rulebases and both kinds of Negation.
  - Notice that the "p" (propositional) component of the myng-code changes.
- Implication Options:
  - We'll disable Equivalences.
  - New in Version 1.01: Disjunctive Logic is not an Expressivity Level, as it was in Version 1.0. Disjunction (Or) in the heads of rules now may be mixed-in with any Expressivity Level
  - Notice that the "i" (implication) component of the myng-code changes.





## Selection of Propositional Options

## No Rulebases, Fuzzy Logic or Negations

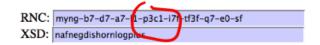
Reset Form

Variables

Interpreted

Expressions

Generate Schema Download RNC Schema Download XSD Anchor Schema



## Term Sequences: Expressivity **Propositional** Implication Term "Backbone" Options **Options** Number of Terms Options (Check Zero or More) (Check Zero or More) (Select One) (Check Zero or More) (Select One) Equivalences Object Identifiers Atomic Formulas None Ground Fact ■ Rulebases ✓ Inference Direction Unary (Zero or One) Slots Ground Logic Entailments ■ Non-Material Binary (Zero or Two) Slot Cardinality Datalog Degree of Uncertainty Conjunctive Heads Unary/Binary (Zero to ✓ Slot Weight Two) Horn Logic Strong Negation ✓ Negative Constraints Equations Polyadic (Zero or More) Full First-Order Logic ■ Weak Negation Disjunctive Heads Oriented Equations (Negation as Failure) Existential Heads Term Typing Node Identifiers Data Terms ✓ In-Place Annotation Skolem Constants XML base Reified Terms XML id **Expression** Ouantification Serialization Treatment of Attributes Language (Select One) Options Options Options With Default Values (Check Zero or More) (Check Zero or More) (Check Zero or More) (Select One) English Abbreviated Implicit Closure Generalized Lists Unordered Groups Required to be Absent Names Slotted Rest Variables Set-valued Stripe-Skipping Required to be Present English Long Names Expressions ✓ Positional Rest Explicit Datatyping Optional French Long Names

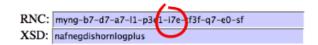
Schema Location

Attribute

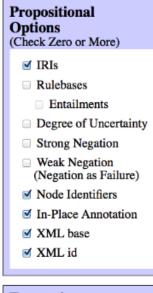
## Selection of Implication Options No Equivalences

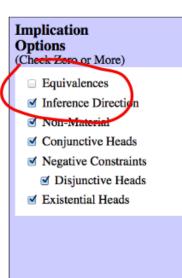
Reset Form

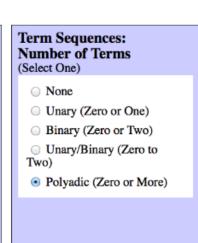
Generate Schema Download RNC Schema Download XSD Anchor Schema

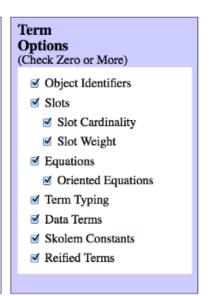


## Expressivity "Backbone" (Select One) Atomic Formulas Ground Fact Ground Logic Datalog Horn Logic Full First-Order Logic

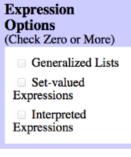








## **Ouantification** Options (Check Zero or More) ✓ Implicit Closure ✓ Slotted Rest Variables Positional Rest Variables



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

With Default Values (Select One)
<ul><li>Required to be Absent</li><li>Required to be Present</li><li>Optional</li></ul>

Treatment of Attributes

Language (Select One)
<ul> <li>English Abbreviated</li> <li>Names</li> </ul>
English Long Names
French Long Names

- Term Sequences
  - We keep Polyadic Term Sequences
- Term Options
  - Disable the frame options: Object Identifiers and Slots.
  - Notice that the "t" (terms) component of the myng-code changes.
- Quantification Options
  - Disable all of them.
  - Notice that the "q" (quantification) component of the myng-code changes.
- The anchor language now reads "disdatalogplus\_mid".
  - This is one of the RuleML sublanguages that is newly available in Version 1.01.
  - Recent research<sup>[1]</sup> has shown that with some additional constraints, querying becomes decidable in these languages.
  - The additional constraints are too complex to implement directly in Relax NG or XSD, but may be possible in Schematron.

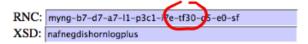




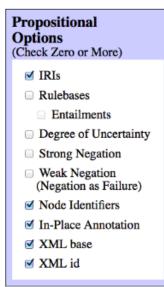
## Selection of Term Options

## No Object Identifiers, or Slots

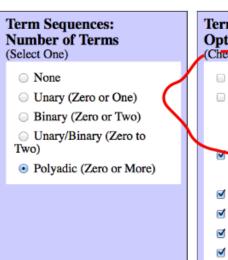
Reset Form Generate Schema Download RNC Schema Download XSD Anchor Schema

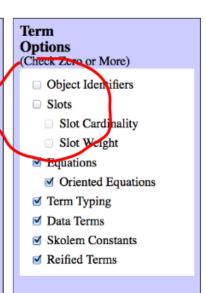


## Expressivity "Backbone" (Select One) Atomic Formulas Ground Fact Ground Logic Datalog Horn Logic Full First-Order Logic

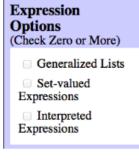


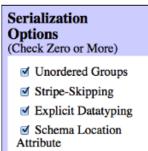
## **Implication** Options (Check Zero or More) Equivalences ✓ Inference Direction ✓ Non-Material Conjunctive Heads Negative Constraints Disjunctive Heads Existential Heads

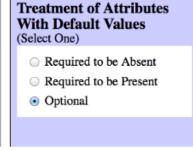




## **Ouantification** Options (Check Zero or More) ☑ Implicit Closure Slotted Rest Variables Positional Rest Variables







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

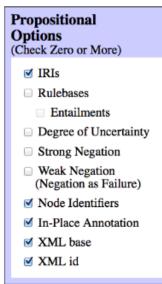
## Selection of Quantification Options

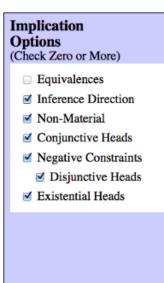
## No Implicit Closure, Rest Variables

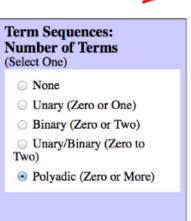
Reset Form Generate Schema Download RNC Schema Download XSD Anchor Schema

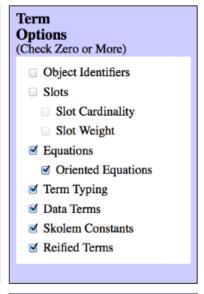


## Expressivity "Backbone" (Select One) Atomic Formulas Ground Fact Ground Logic Datalog Horn Logic Full First-Order Logic

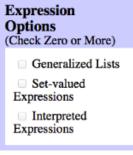


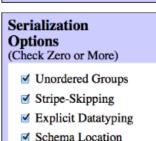






## Ouantification Options (Check Zero or More) Implicit Closure Slotted Rest Variables Positional Rest Variables





Attribute

With Default Values (Select One)
<ul> <li>Required to be Absent</li> </ul>
<ul> <li>Required to be Present</li> </ul>
<ul> <li>Optional</li> </ul>

**Treatment of Attributes** 

Language (Select One)	
<ul> <li>English Abbreviated Names</li> </ul>	
<ul><li>English Long Names</li><li>French Long Names</li></ul>	

## 3 Usage of Customized Schemas

■ Instructions for online validation of RuleML instances against the Relax NG schemas are presented at Validating with Relax NG for RuleML 1.01

■ Example: Validating disdatalogplus\_min.ruleml (http://validator.nu/?doc=http%3A%2F %2Fdeliberation.ruleml.org%2F1.01%2Fexa%2FDatalogPlus%2Fdisdatalogplus\_min.ruleml& schema=http%3A%2F%2Fdeliberation.ruleml.org%2F1.01%2Fmyng-b7-d7-a7-l1-p1-i78-

t210-q0-e0-sf.rnc&showsource=yes).

Using Validator.nu
Validation of disdatalogistus, min.rulemil

Val

## Using Validator.nu Validation of disdatalogplus\_min.ruleml

## Validation results for http://deliberation.ruleml.org/1.01/exa/DatalogPlus/disdatalogplus\_min.ruleml

Address ‡	http://deliberation.ruleml.org/1.01/exa/DatalogPlus/disdatalogplus_min.ruleml	
Encoding	As set by the server/page ‡	
Schemas	http://deliberation.ruleml.org/1.01/myng-b7-d7-a7-l1-p1-i78-t210-q0-e0-sf.rnc	
Preset	None ‡	
Parser	Automatically from Content-Type ‡	
XMLNS Filter		
	☐ Be lax about HTTP Content-Type	
	☐ Show Image Report	
	✓ Show Source	
	☐ Show Outline	
	Validate	

Info: The Content-Type was text/xml. Using the XML parser (not resolving external entities).

The document validates according to the specified schema(s) and to additional constraints checked by the validator.

## 4 References

1. ↑ Georg Gottlob, Giorgio Orsi, Andreas Pieris, and Mantas Šimkus. Datalog and its extensions for semantic web databases. In Thomas Eiter and Thomas Krennwallner, editors, Reasoning Web. Semantic Technologies for Advanced Query Answering, volume 7487 of Lecture Notes in Computer Science, pages 54–77. Springer Berlin Heidelberg, 2012.

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- This page has been accessed 256 times.