

Formal Models of RDF I

- **Official Semantics: RDF Model Theory**
[→ <http://www.w3.org/TR/rdf-mt/>]

Specification of a precise semantics for RDF (and RDFS), and of corresponding entailment and inference rules which are sanctioned by the semantics.

- **Other Proposals:**
 - RDFS(FA)
[→ <http://dl-web.man.ac.uk/rdfsfa/>]
UML-Like Stratification
 - RDF in First-Order Logic
[→ http://nestroy.wi-inf.uni-essen.de/rdf/logical_interpretation/]
(Outdated RDF semantics in FOL)

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Formal Models of RDF II

- **RDF-MT is based on classical Tarski-style Model Theory**
- **Some Entailment rules for RDFS:**

	If E contains:	then add:
rdf1	xxx aaa yyy .	aaa rdf:type rdf:Property .
rdfs2	xxx aaa yyy . aaa rdfs:domain zzz .	xxx rdf:type zzz .
rdfs3	xxx aaa uuu . aaa rdfs:range zzz .	uuu rdf:type zzz .
rdfs4a	xxx aaa yyy .	xxx rdf:type rdfs:Resource
rdfs4b	xxx aaa uuu .	uuu rdf:type rdfs:Resource
rdfs5a	aaa rdfs:subPropertyOf bbb . bbb rdfs:subPropertyOf ccc .	aaa rdfs:subPropertyOf ccc
rdfs5b	xxx rdf:type rdf:Property .	xxx rdfs:subPropertyOf xxx

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Formal Model of RDF III

- The entailment process terminates on any finite RDF graph
→ only finitely many possible triples can be formed from a given finite vocabulary.
- Example Graph (Single Triple):
[foo bar baz].
- Closure (for mentioned rules only !):

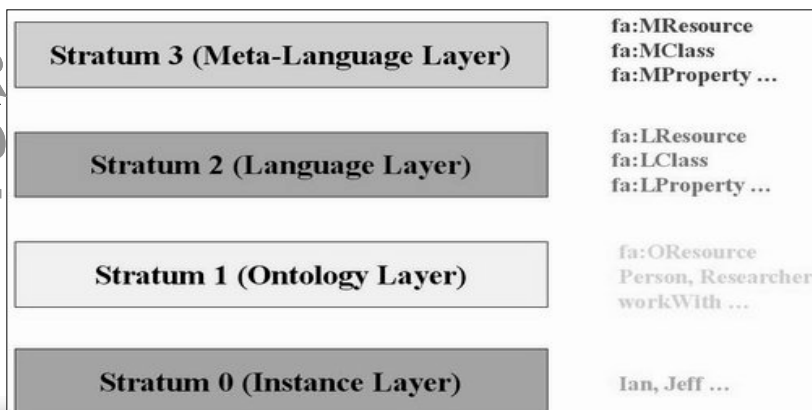
- | | | |
|----|--|----------------|
| 1. | foo bar baz . | Source |
| 2. | foo rdf:type rdfs:Resource . | Rule 4a on (1) |
| 3. | baz rdf:type rdfs:Resource . | Rule 4a on (1) |
| 4. | bar rdf:type rdf:Property . | Rule 1 on (1) |
| 5. | rdf:type rdf:type rdf:Property . | Rule 1 on (4) |
| 6. | rdf:type rdfs:subPropertyOf rdf:type. | Rule 5b on (5) |
| 7. | bar rdfs:subPropertyOf bar. | Rule 5b on (4) |
| 8. | rdfs:subPropertyOf rdf:type rdf:Property | Rule 1 on (6) |

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RDFS(FA) – Stratified Semantics

Similar to UML → Stratification

Avoids cyclic definitions (Class is a Class)



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RDF Applications

- RDF did not receive strong industry support
- It's killer applications are:
 - Carrier Syntax for OWL
(*W3C Web Ontology Language*)
 - Alternative Syntax for Dublin Core
(*Metadata Standard*)
 - Carrier Syntax for RSS, OCS
(*News Syndication*)
 - Alternative Syntax for P3P
(*Platform for Privacy Preferences*)
 - Data Format used within Mozilla Web-Browser
[→ <http://www.mozilla.org/rdf/doc/>]

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RSS & OCS

- Web content syndication formats
- Acronym for
 - RSS: „Really Simple Syndication“
 - OCS: „Open Content Syndication“
- Data Organization
 - Several Channels publish News
 - Each Channel publishes several (News)Items
- Aggregators
 - Collect News from Providers
 - E.g. O'Reilly Meerkat [→ <http://www.oreillynet.com/meerkat/>]
- Providers
 - Blogs (Personal Web logs)
 - News Companies (cnn.com etc.)
 - ... Your Portal ??? ...

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RSS – O'Reilly Meerkat

The screenshot shows the 'MEERKAT: AN OPEN WIRE SERVICE' interface. It includes a search bar, a list of channels, and a table of recent stories. The table has columns for Action, Story, Source, Category, and Date.

Action	Story	Source	Category	Date
1	XACML 1.0 Specification Set Approved as an OASIS Standard OASIS has announced the successful balloting and approval of the Extensible Access Control Markup Language (XACML) a new OASIS Open Standard. Formal language definitions are provided in XML Schema Definitions (a Policy Schema and a Context Schema). Chaired by Carlisle Adams (Entrust) and Hal Lockhart (BEA Systems), the XACML TC has created this XML specification for expressing policies for information access over the Internet.	The XML Cover Page	Data: XML	02/11 9:20am
2	Cascade attacks From the abstract: "For such networks where loads can redistribute among the nodes, intentional attacks can lead to a cascade of overload failures, which can in turn cause the entire or a substantial part of the network to collapse." [Creator: Lucas Gonze, Subject: P2P, Publisher: O'Reilly and Associates, Date: 2003-02-11 09:10:04, Format: text/html, Language: en-us, Rights: Copyright 2003, O'Reilly and Associates]	O'Reilly Network Weblog	Weblogs	02/11 9:20am
3	www.struts.ru - site about Jakarta Struts in Russian 11.02.03, 12:07 :: Alexey Kovazin	Jaxable.com	Lang: Java	02/11 9:28am

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Dublin Core

- Set of 15 properties, which are used as metadata for web pages
- For example:
 - “Title”:
the name given to the resource
 - “Creator”:
the person or organization primarily responsible for the resource
 - “Subject”:
what the resource is about
 - “Description”:
a description of the content

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