

RDF 1.2 Status Report: The new version is almost here!

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with contributions from the W3C RDF & SPARQL WG

** Work done as a W3C "invited expert"*

Introduction to RDF

Simple KR language, cornerstone of the “Semantic Web Stack”

Widely adopted and deployed

more than half of all Web pages contain some embedded RDF

all Adobe documents contain some RDF

etc.

“RDF has turned out to be the most **catastrophically successful failure** there is.”

– Charles Ivie (Ortecha)

RDF Timeline

May 1997	First version of the PICS-NG proposal
October 1997	First public "working draft" of something called RDF
February 1999	RDF "Model and Syntax"
February 2004	RDF "Model and Syntax" revised ("RDF 1.0")
January 2008	SPARQL 1.0
March 2013	SPARQL 1.1
February 2014	RDF 1.1
December 2021	RDF-star CG final report published
August 2022	RDF-star WG formed (later renamed RDF & SPARQL WG)
April 2026	First RDF 1.2 Candidate Recommendations

Statements about statements?

Up until now done by “modeling” RDF statements in RDF

Reification: cumbersome, misunderstood, unpopular

One of the most persistent criticisms of RDF

Reification could be seen as the RDF counterpart of LPG “edge properties”

(RDF is more expressive, though)

Over the years, many ideas and proposals on how to fix this

Most notably, “Reification Done Right” by Hartig & Thompson in 2014

RDR eventually parlayed into “RDF-Star”, first a CG, now a WG

Modeling practices and conventions in RDF

Common problem:

:A :p :B .

(but what if you need to say things about the relationship?)

Standard reification:

[] a rdf:Statement ; rdf:subject :A ; rdf:predicate :p ; rdf:object :B .

Typical solution – “lift” the relationship to be its own node:

[] a :p_as_node ; :source :A ; :sink :B .

(for all intents and purposes equivalent with the standard reification)

Some use cases

Provenance

Qualifying statements

“Marginalia”, annotations

Modalities (beliefs, etc.)

Also: bringing RDF closer to LPGs (aka “RDF/LPG alignment”)

Challenges

Triples in an RDF graph are unique (remember: set semantics)

:Elizabeth :married :Richard

We want to qualify this with a year

but... Elizabeth married Richard twice (1964 and 1975)

Breaking existing RDF (1.1) semantics is highly undesirable

Introducing new semantics could have consequences for RDFS & OWL

Relationship between statements and named graphs?

Is a reified statement a singleton named graph?

Basic Idea of How RDF 1.2 Extends RDF 1.1

New type of term: **Triple Term** (the other ones are IRI, blank node, and literal)

A triple term can be thought of as an un-asserted triple

Triple terms can be given an identifier (a "reifier") via a new predicate `rdf:reifies`

:Marriage1 `rdf:reifies` <<(**:ElizabethTaylor** `:married` **:RichardBurton**)>>

:Marriage1 is now an "occurrence" of the original triple

Triple terms cannot be used in the subject position of a triple

A triple term can have multiple reifiers → multiple "occurrences"

A reifier can identify multiple triple terms (this was controversial in the WG)

Semantics

RDF 1.1 model theory has been extended to cover the additions RDF 1.2 introduces

RDF adds the new property **rdf:reifies** and a new datatype **rdf:dirLangString**

RDF Schema adds a new class **rdfs:Proposition** such that

rdf:reifies rdfs:range rdfs:Proposition

Semantics has been defined with careful consideration to allow other things to be constructed on top of RDF 1.2 (e.g., OWL)

Syntax

We have extended the RDF serialization formats to include triple terms

In extended syntaxes, triple terms look like this: <<(:A :p :B)>>

In addition, some syntactic sugar is provided

Without the use of triple terms, the syntaxes remain the same as in RDF 1.1

(except that we now also allow bi-directional text in literals: datatype **rdf:dirLangString**)

JSON-LD is worked on by a separate WG

Reification Syntax

<< :Elizabeth :married :Richard ~ :Marriage1 >> :date "1964-03-15"^^xsd:date .

Fully expanded, this is

:Marriage1 rdf:reifies <<(:Elizabeth :married :Richard)>> .

:Marriage1 :date "1964-03-15"^^xsd:date .

Note that the reified triple is not asserted

("not asserted" == "not part of the graph")

Annotation Syntax

:Elizabeth :married :Richard ~ :Marriage1 { | :date "1964-03-15"^^xsd:date | }

This is syntactic sugar: the reified triple is also asserted, so this is the same as

:Elizabeth :married :Richard .

<< :Elizabeth :married :Richard ~ :Marriage1 >> :date "1964-03-15"^^xsd:date

which is the same as

:Elizabeth :married :Richard .

:Marriage1 rdf:reifies <<(:Elizabeth :married :Richard)>> .

:Marriage1 :date "1964-03-15"^^xsd:date .

What About Multiple Triple Occurrences?

One triple, two marriages

:Elizabeth :married :Richard .

<< :Elizabeth :married :Richard ~ :Marriage1 >> :date "1964-03-15"^^xsd:date .

<< :Elizabeth :married :Richard ~ :Marriage2 >> :date "1975-10-10"^^xsd:date .

You could also use the annotation syntax to achieve this

The Road to “Candidate Recommendations” and Beyond

All big problems have been solved and settled

Some issues will be left to the next WG

All older documents had to be brought up the current documentation standard

(lots of grunt work which nobody really sees)

The complete standard will consist of 20+ documents (not all in the “REC-track”)

2 now in CR (*Concepts and Semantics*), 1 more “any day now” (*N-Triples*)

The “horizontal reviews” completed, now looking for implementation experience

We proceed in “waves”, next up will be all the remaining syntax documents

Summary

Standard reification in RDF has been misunderstood and considered awkward

RDF is often criticized for the lack of "edge properties"

RDF 1.2 (fka "RDF-star") simplifies the reification process

Syntax and semantics have been extended for a new term: triple term

Work is nearing completion

In Memoriam: Gregg Kellogg

Long-time WG member and document editor passed away in September 2025 after long illness

Gregg contributed to many W3C WGs; he was best known for JSON-LD

He had monumental influence on Web standards and technologies, and the RDF & SPARQL WG certainly is not the same without him

#KGCC2026

Join the Conversation

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