

What's New in RDF 1.1

SemTechBiz
June 2013

<http://www.w3.org/2013/Talks/0603-rdf11>

Sandro Hawke, W3C Staff
sandro@w3.org
@sandhawke

Overview

1. Stability and Interoperability
2. Non-XML Syntaxes
 - Turtle (and friends)
 - JSON-LD
3. Datasets
 - “Quads”, “Named Graphs”, “Reification”, ...
4. Improved data types
5. Miscellaneous
6. Q & A

Part 1: Standards

- RDF developed 1997-1999
- RDF “rearticulated” 2001-2004
 - Added datatypes
 - Abstract model, multiple syntaxes in theory
- SPARQL 1.0 2004-2008
- SPARQL 1.1 2009-2013
- RDF 1.1 Working Group: 2011-2013

Chartering

- RDF Next Steps (Workshop, June 2010)
- Future of RDF (Survey, August 2010)
- Charter:
 - Turtle
 - JSON
 - “Multiple Graphs” (Datasets)
 - (smaller things)

NOT RDF 2

- Lots of “please don't touch anything”
- ...but still some pain points:
 - XML
 - Reification
 - Collections/Containers
 - ...
- **Fix things without breaking anything!**

Participation



(That's the workshop. Working group mostly meets on phone.)

Part 2: Beyond XML

- In theory, RDF didn't have to look like this

```
<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
         xmlns:contact="http://www.w3.org/2000/10/swap/pim/contact#">
  <contact:Person rdf:about="http://www.w3.org/People/EM/contact#me">
    <contact:fullName>Eric Miller</contact:fullName>
    <contact:mailbox rdf:resource="mailto:em@w3.org"/>
    <contact:personalTitle>Dr.</contact:personalTitle>
  </contact:Person>
</rdf:RDF>
```

- XML was created for marking-up (annotating) text.

Turtle

```
@prefix contact: <http://www.w3.org/2000/10/swap/pim/contact#>.
@prefix miller:  <http://www.w3.org/People/EM/contact#>.
```

```
miller:me a contact:Person;
    contact:fullName "Eric Miller";
    contact:mailbox <mailto:em@w3.org>;
    contact:personalTitle "Dr.".
```

Turtle Features

- Elegant Syntax
 - Pretty easy to read
 - Pretty easy to write
 - Nice shortcuts like [...] and (...)
 - (Still has namespaces)
- No confusion with XML
 - Really matches RDF model
- Very widely deployed de facto standard

Changes During Standardization

(Changes from what?)

- Write **18.0** instead of **18.** for decimals
 - Previously: `<a> 1 . <c> <d> <e> .`
 - Now okay: `<a> 1. <c> <d> <e>.`
 - But maybe people are used to it now. We'll see.
- More allowed characters, escaping rules
 - OK: `foo:bar:baz` (colon in local part, for FB OGP)
 - OK: `part:33445` (local part starting with digit)

W3C Candidate Recommendation

- If you have a Turtle parser:
 - Read over the spec (it's about 20 pages, with lots of examples)
 - See how your code fares against the test suite
 - Send us your results
- Make sure your software can read Turtle
- Consider writing it instead of RDF/XML

JSON-LD

```
{  
  "@id": "http://www.w3.org/People/EM/contact#me",  
  "fullName": "Eric Miller",  
  "mailbox": "mailto:em@w3.org",  
  "personalTitle": "Dr."  
}
```

- Very simple!
- but needs a “context”

```
"@context": {  
  "fullName": "http://www.w3.org/2000/10/swap/pim/contact#fullName",  
  "mailbox": {  
    "@id": "http://www.w3.org/2000/10/swap/pim/contact#mailbox",  
    "@type": "@id"  
  },  
  "personalTitle":  
  "http://www.w3.org/2000/10/swap/pim/contact#personalTitle"
```

Determining Context

- Context can come from:
 - Value of @context property of the JSON object
 - URL dereference of value of @context property
 - URL dereference of HTTP header value
 - Application Specific
- Normal JSON can be JSON-LD
 - (if the receiver knows the @context)
- JSON-LD-API provides functions to convert among various useful forms (with & without context)

Embedding in HTML

- No problem for Web Apps
- Promising (experimental) for data publication

```
<script type="text/turtle">
```

```
  ""  
</script>
```

```
<script type="application/ld+json">
```

```
  ""  
</script>
```

Fate of RDF/XML?

- Not deprecated
- Valuable deployment (eg Adobe XMP)
- But it's now it's clear, RDF =
 - RDF/XML
 - RDFa
 - SPARQL
 - Turtle
 - JSON-LD
 - ... etc

Part 3: Datasets

- Old challenge in RDF. How do you:
 1. Fetch or construct two or more RDF documents
 2. Keep them separate
 3. Say something about them in RDF?
- Reification?
 - 1999 vocabulary for talking about RDF triples in RDF triples. Never fully specified

SPARQL “Named Graphs”

- Triples are in zero or more “named graphs”

```
# some “default graph” triples  
<s> <p> <o1>.
```

```
GRAPH <g1> {  
    # some triples in graph “g1”  
    <s> <p> <o1>  
}
```

```
GRAPH <g2> {  
    # some triples in graph “g2”  
    <s> <p> <o2>  
}
```

Alternate View: Quads

```
<s> <p> <o1>. # in default graph
<s> <p> <o1> <g1>. # in graph g1
<s> <p> <o2> <g2>. # in graph g2
```

- Formally speaking these are different:
 - Default graph + a set of <name, graph> pairs
 - A set of triples and quads
- BUT the specs advise against noticing the difference (ie empty named graphs), so you can think about it either way.

Why Default Graph?

- For folks who don't want the named graphs
 - Just looking for triples? Here you go....
- How to use it?
 - Might be used for metadata (my favorite)
 - Might be union of all named graphs
 - Might be something else
- So how is an application entitled to use it?
 - Depends on how it got it (what link or protocol)

Semantics

- Graph names do not necessarily denote the associated graph
- It's just structure; semantics depend on vocabulary of use in that dataset.

```
GRAPH <#phase1> { eg:item7 eg:weight 31 }
```

```
<#phase1> vt:begins "2013-01-01"^^xs:date;  
             vt:ends  "2013-05-30"^^xs:date.
```

- We don't specify what <#phase1> denotes
 - vt:begins and vt:ends just use it (indirectly) to state properties of some triples

Blank Nodes in Datasets

- Blank nodes can be shared among graphs
 - Surprising to some people
 - Needed for some use cases (eg separation of inference)
- Blank node as Graph Names?
 - Maybe. See ISSUE-131

Syntax

- Examples above use subset of SPARQL
- TriG
 - Very similar, except no GRAPH keywords and default graph in {...}.
- N-Quads
 - 3 or 4 IRIs/literals on a line
- Others?

Part 4: Changes to Data Types

- In RDF 1.0:

`<s> <p> "Hello World".`

was not the same triple as:

`<s> <p> "Hello World"^^xsd:string.`

- If you ever stumbled on this, it was painful.
- In RDF 1.1 they are the same triple.

rdf:HTML

- A data type for indicating some text is an HTML fragment:

```
<s> <p> ' '
    <span class="nav">
      <a href="/">Home</a>
    </span>
    ' '^^rdf:HTML.
```

- Consider instead of plain string or rdf:XMLLiteral

Other Datatype Details

- `rdf:XMLLiteral` changed to match what's usually implemented
- Specific list of datatypes suggested, including new XSD types like durations
- Language-tagging formalized slightly differently
- Ill-typed literals (eg: “a”^^`xs:int`) now make the graph logically inconsistent
- Now all literals have a datatype
- Semantics are now in RDF, not RDFS

Part 5: Miscellaneous

- Editorial changes (rewrites)
 - rdf-concepts
 - rdf-mt (semantics)
 - ... expecting Primer
- Standard way to Skolemize blank nodes
 - `http:// . . . /.well-known/genid/ . . .`

Collections and Containers

- We're not deprecating `rdf:Seq` or `rdf:List` (!!)
- But Turtle and JSON-LD both have special support for “pure” `rdf:List` structures
- I hope implementations will optimize for that.
 - That is, lists which can be losslessly serialized in turtle using the `(...)` list syntax.

Part 6: Q & A

- See <http://www.w3.org/2010/rdf-wg>
- All of our drafts, issues, email, etc are public
- We'll answer all email
 - public-rdf-comments@w3.org