

An Ordered RDF List

James Leigh and David Wood, Zepheira
{jleigh, dwood}@zepheira.com

Introduction

This proposal is to introduce a fundamental concept of ordered lists in RDF.

RDF has been based on the concepts of URI, blank node, plain literal, and typed literal. This proposal proposes a fifth concept of ordered list. An ordered list is a n-sized tuple of any the five listed concepts, including ordered lists.

The way RDF has dealt with ordered collections in the past has not been a problem. RDF/XML and N3/Turtle provide adequate support. It has not been until the standardisation of SPARQL that this issues has come to light. This issue being the way we currently deal with ordered collections, through tools or in SPARQL, is so difficult that it limits adoption of RDF. So much of data retrieval, which is currently dominated on the Web by XML, includes the notion of ordered collections. RDF must align the RDF representation with the conceptual notion of ordered collections if it has a chance of making inroads into already established networks.

Requirements

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

An implementation is not compliant if it fails to satisfy one or more of the MUST or REQUIRED level requirements for the protocols it implements. An implementation that satisfies all the MUST or REQUIRED level and all the SHOULD level requirements for its protocols is said to be "unconditionally compliant"; one that satisfies all the MUST level requirements but not all the SHOULD level requirements for its protocols is said to be "conditionally compliant."

Impact on Triples

The RDF Concepts and Abstract Syntax document will have to be updated to include ordered lists an RDF value.

An RDF triple contains three components:

- the subject, which is an RDF URI reference or a blank node
- the predicate, which is an RDF URI reference
- the object, which is an RDF URI reference, a literal, a blank node, **or an ordered list**

Impact on RDF/XML

The standard syntax will not change.

Parsers SHOULD allow higher level logic to identify an ordered list from the `parseType="Collection"` attribute.

Parsers MAY treat well structured `rdf:first/rdf:rest` triples as an ordered list.

Impact on Turtle

The standard syntax will not change.

Parsers SHOULD allow higher level logic to identify an ordered list from the `'(...)` notation.

Parsers MAY treat well structured `rdf:first/rdf:rest` triples as an ordered list.

Impact on RDFa

RDFa [1] MUST introduce syntax for an ordered list.

RDFa could introduce the attribute `"list"` to indicate that all child elements are ordered members of an ordered list. Possible syntax could look like this:

```
<span about="#subject" list=":predicate">  
  <span about="#member"/>  
  <span>plain literal</span>  
  <span datatype=":aDatatype">typed literal</span>  
</span>
```

Impact on SPARQL

The SPARQL pattern `'(...)` MUST match ordered lists of the same members and MAY match `rdf:first/rdf:rest` triples of the same members.

SPARQL MUST treat an ordered list as a single term that can only match in the object (last) position of a basic graph pattern. However, an RDF store MAY store `rdf:first/rdf:rest` triples instead of an ordered list.

The SPARQL result format [2] MUST introduce syntax for an ordered list.

SPARQL Query Results XML Format could introduce the element `"list"` to indicate that all child elements are ordered list members, e.g.

```
<sparql xmlns="http://www.w3.org/2005/sparql-results#">
  <head>
    <variable name="x"/>
  </head>
  <result>
    <binding name="x">
      <list>
        <bnode>r2</bnode>
        <uri>http://work.example.org/bob/</uri>
        <literal xml:lang="en">Bob</literal>
        <literal datatype="http://www.w3.org/2001/XMLSchema#integer">30</literal>
        <uri>mailto:bob@work.example.org</uri>
      </list>
    </binding>
  </result>
</sparql>
```

References

[1] Ben Adida, Mark Birbeck, Shane McCarron and Steven Pemberton (eds.), RDFa in XHTML: Syntax and Processing, W3C Recommendation 14 October 2008, <http://www.w3.org/TR/rdfa-syntax/>

[2] Dave Beckett and Jeen Broekstra (eds.), SPARQL Query Results XML Format, W3C Recommendation 15 January 2008, <http://www.w3.org/TR/rdf-sparql-XMLres/>