

Uncertain about your data or provenance?

Use



To model your uncertainty!

What is W3C PROV?

Since April 30th 2013, the **PROV** family of specifications is a **W3C Recommendation!**

This means that PROV is the new standard for expressing and interchanging provenance on the Web.

PROV includes a **data model**, **constraints** and two **serializations!**

Modeling Uncertainty

In **PROV** → Bundles model coarse-grained provenance of provenance (PoP)

In **UP** → attributes model fine-grained uncertain provenance and provenance of uncertain things.

prefix up <<http://semweb.mmlab.be/ns/up/>>



Lightweight approach



Fully PROV compliant

Attributes for modeling of uncertain provenance

up:assertionConfidence: confidence (between 0 and 1) assigned to a provenance statement by the asserter

up:assertionType:

- up:HumanAsserted
- up:MachineGenerated
- up:MachineCollected
- up:Complete
- up:Incomplete
- up:Future
- up:Trusted
- up:Untrusted

Example 1: Provenance Reconstruction

```
entity(ex:document1)
entity(ex:document2)
entity(ex:document3)
wasDerivedFrom(`d1`; ex:document3, ex:document1,
  [up:assertionConfidence="0.6",
   up:assertionType="up:MachineGenerated"])
wasDerivedFrom(`d2`; ex:document3, ex:document2,
  [up:assertionConfidence="0.9",
   up:assertionType="up:HumanAsserted"])
```

Attributes for modeling of uncertainty

up:contentConfidence: confidence (between 0 and 1) assigned to the content whose provenance is asserted.

Example 2: Named Entity Recognition

```
entity(ex:document)
entity(ex:namedEntities,
  [prov:type="prov:Collection"])
activity(ex:NER)
wasDerivedFrom(ex:namedEntities, ex:document, ex:NER)
entity(dbpedia:New_York)
entity(dbpedia:Joe_Biden)
entity(ex:New_York,
  [up:contentConfidence="0.6"])
entity(ex:Joe_Biden,
  [up:contentConfidence="0.8"])
specializationOf(ex:New_York, dbpedia:New_York)
specializationOf(ex:Joe_Biden, dbpedia:Joe_Biden)
hadMember(ex:namedEntities, ex:New_York)
hadMember(ex:namedEntities, ex:Joe_Biden)
```

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