Web Ontology Language

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So what's happening?

- RDF - A recap
- What is OWL?
- How does it relate to RDF?
- Some technicalities
- Demo

RDF - Say what now?

- Makes **structural** statements about resources

- Organized into triples of *<subject, predicate, object>*

- subject → **lion**, predicate → **eats**, object → **zebra**

  For example:

  → **<lion, eats, zebra>**

  Another example, for the author of a book.

 → **<J.K.Rowling, wrote, Harry Potter>**

What is OWL?

- OWL is an enhancement to RDF

- Vocabulary for describing properties, classes, and *relations between* these

  ○ e.g. cardinality, equality, symmetrism ++

- W3C created it in order to get machines better as reasoning tasks

- For instance:

  When comparing knowledge bases on the web, a program must know when two different terms are being used to mean the same (e.g. "car" and "automobile")

- A solution to this is to collect information into ontologies.
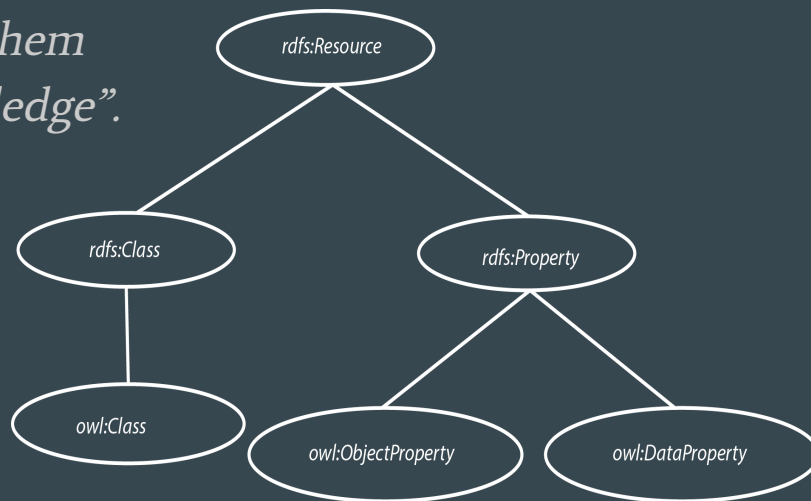
  Which is kind of hard …
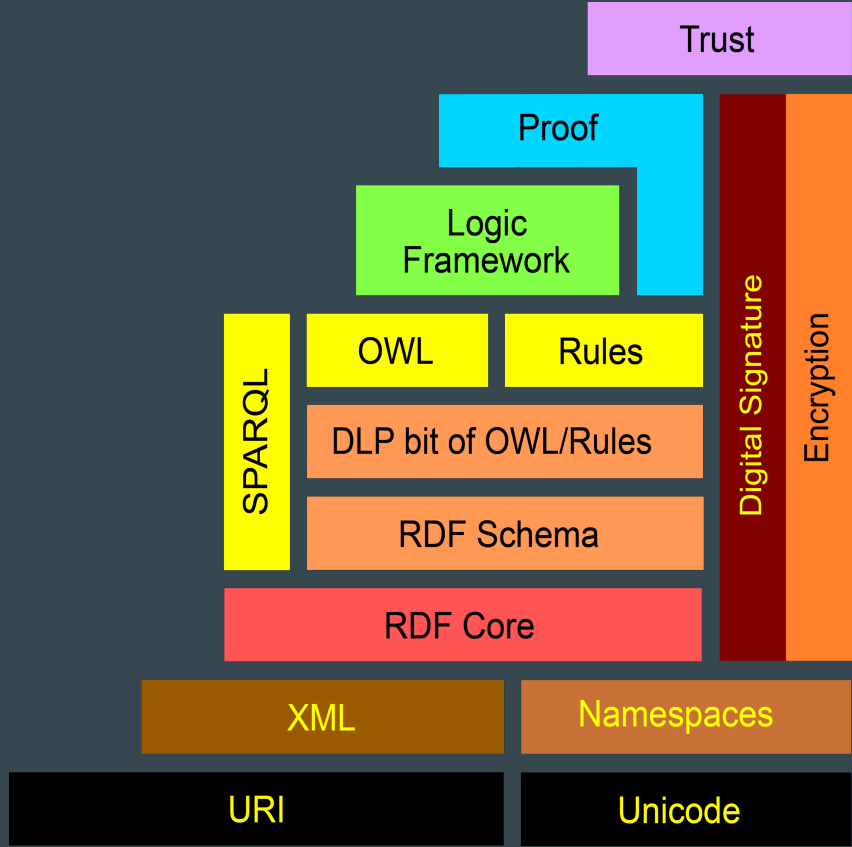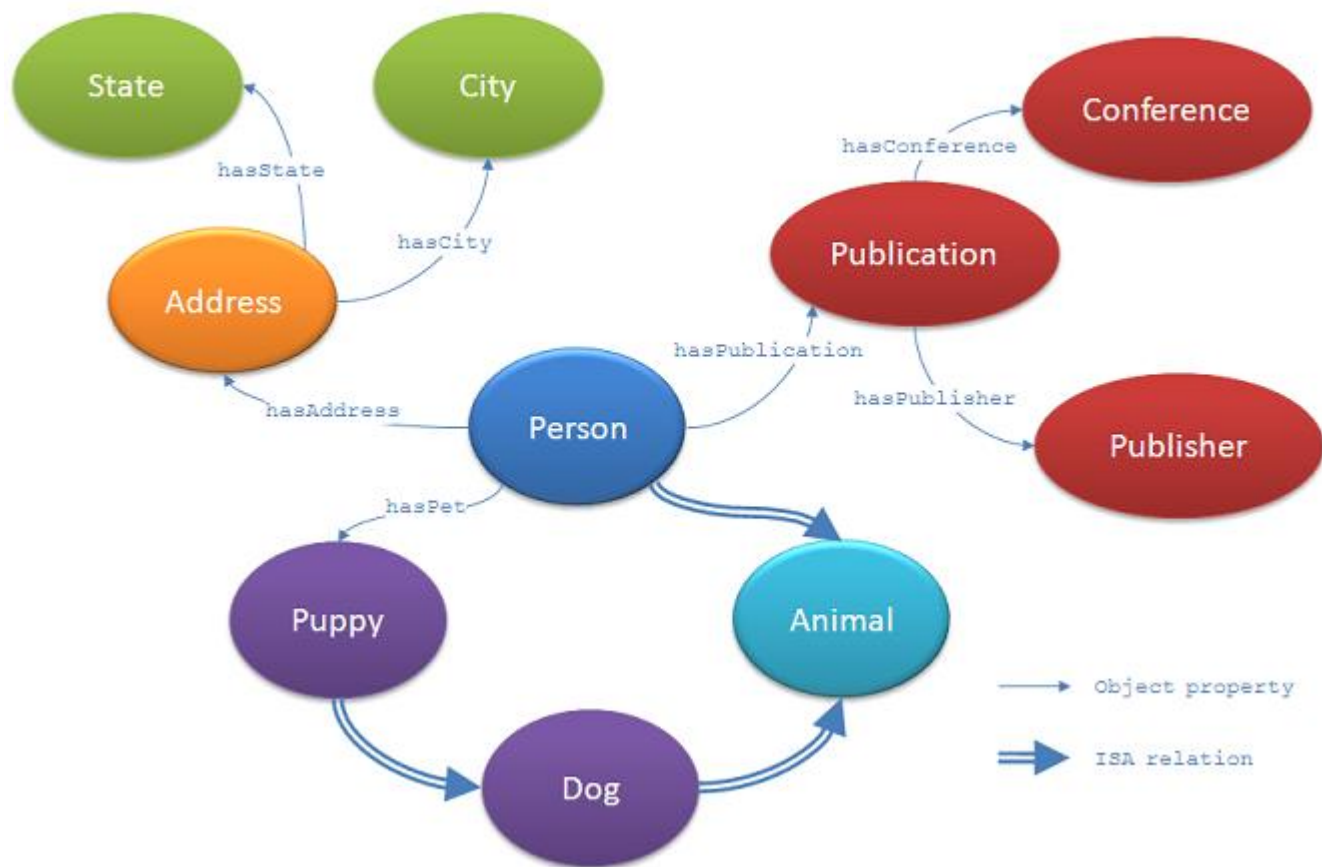
Ontologies, you say?

From the book:

> "An ontology formally describes a list of terms and the relationships between them in order to represent an area of knowledge".

These relationships are things such as:

- Subclass relationship
- Properties - e.g. color, name
- Value restrictions - e.g. cardinality
- and others...

rdfs:Resource

rdfs:Class

rdfs:Property

owl:Class

owl:ObjectProperty

owl:DataProperty

OWL vs. RDF - A summary

- RDF defines the **_structure_** of the data. OWL is used to describe **_semantic relationships_** between data.

- Used for automated reasoning.

  Example - derive implicit facts:

  If we have that "Bob is married to Jane", then with OWL we can **derive** that "Jane is married to Bob".

A simple example (turtle syntax)

```
person:id1  person:name       "Bob" ;
             person:marriedTo  person:id2 .

person:id2  person:name       "Jane" .

person:marriedTo  rdf:type  owl:SymmetricProperty .
```

From this we can derive that Linda is married to Lars because "marriedTo" is symmetric

but … there is always a tradeoff

- In OWL, there is a tradeoff between expressiveness and reasoning efficiency.

- More expressiveness → lower efficiency

- Therefore OWL comes in three types: OWL Full, OWL DL, and OWL Lite.

  - The details are rather technical, but it boils down to   →   →   →   →   →   →

- Choose the one best suited for your needs.

OWL FULL

OWL DL

OWL LITE

RDFS

RDF
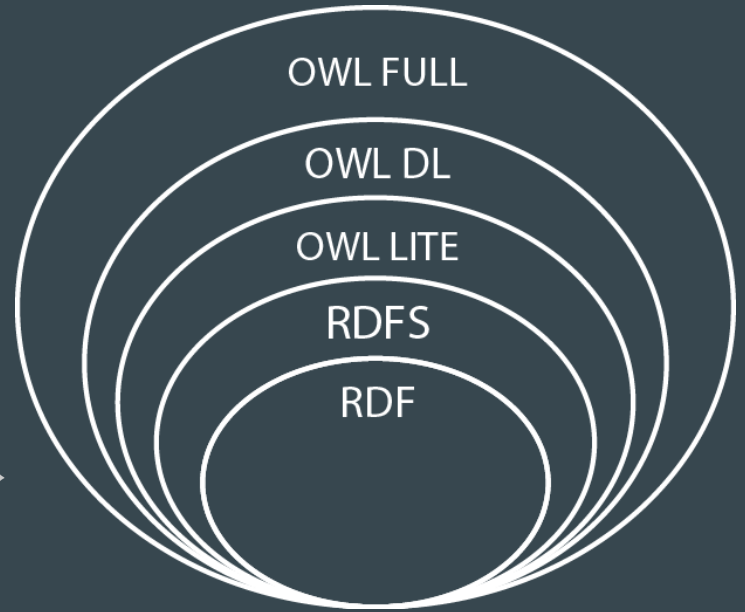
OWL 2 - The future? Maybe?

- Quick mention, because the book is outdated.

- OWL 2 is an update to OWL. No vast changes, but it is a bit more expressive and has more user-friendly syntax.

- It is backwards compatible.

- The principles and the purpose of the language are the same as for OWL.

So ... why OWL?

- Enables incorporation of arbitrary semantic metadata on the web

- Example usage

  - Music - artist, track length, album info ++

  - Video - Summaries, reviews ++

  - News articles - Genre, keywords ++

The moment you've all been waiting for

Live Demo