

Distributed Software Development

RDF

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17-2: RDF

- RDF stands for *Resource Description Framework*
- Provides a way to describe properties that belong to objects.
- Much like a relational database.
- Can be serialized as XML, but it's easiest not to get hung up on the XML syntax initially.
 - Built to be created and consumed by machines.

17-3: Uses of RDF

- RDF is a very popular framework for describing resources on the Web.
 - RSS
 - Mozilla
 - Creative Commons
 - FOAF
 - Adobe' XMP project
 - Open Directory Project
- All of these applications need a more powerful way of representing information than XML provides by itself.

17-4: RDF's data model

- Recall that XML produces a tree-structured data model.
- This can make it hard to represent some sorts of knowledge.
- How to denote that two elements share a sub-element?

17-5: Representation in XML

- For example:

```
<song>
  <artist>Doors</artist>
  <title>Break On Through</title>
  <album>Greatest Hits</album>
</song>
<song>
  <artist>Doors</artist>
  <title>Light My Fire</title>
  <album>Greatest Hits</album>
</song>
<song>
  <artist>Devo</artist>
  <title>Through Being Cool</title>
  <album>Greatest Hits</album>
```

17-6: RDF's data model

- RDF represents data in terms of *triples*
- Subject, property, value
- ["http://www.cs.usfca.edu/brooks/S05classes/cs682/slides/rdf.ppt"](http://www.cs.usfca.edu/brooks/S05classes/cs682/slides/rdf.ppt)
title, "RDF Lab"
- Properties allow us to express relations between objects.
 - In AI, we called these things *predicates*

17-7: RDF's data model

- From a set of RDF triples, we can construct an RDF graph.
- Subject and value are nodes
 - Nodes can be
 - URIs - a generalized form of a URL
 - blank nodes - mostly useful as placeholders
 - literals - strings, values, etc.
 - Properties are edges.

17-8: Resources

- An RDF document is a set of statements about *resources*
 - Documents, video clips, services
- A resource is something that has a location.
 - Referred to with a URI
- The subject of an RDF statement is a resource.

17-9: Literals

- The object of an RDF statement can be a resource or a literal.
- Literals are typically strings.
- For example:

```
<rdf:Description rdf:about='http://www.cs.usfca.edu/Brooks'>
  <dc:creator> Brooks </dc:creator>
</rdf:description>
```

17-10: Properties and statements

- A property is a relation between a subject and an object.
- A statement is a subject, a property, and an object.
- This allows RDF statements to be placed in a graph model.
- We called this a semantic network in AI.

17-11: Reification

- It's also possible in RDF to make statements about statements.
- This process is called *reification*

```
<rdf:Description rdf:ID='item10245'>
  <exterm:weight rdf:datatype='&xsd:decimal'>2.4</exterm:weight>
</rdf:Description>

<rdf:Statement rdf:about='#triple12345'>
  <rdf:subject rdf:resource='http://www.example.com/2002/04/products#ite
  <rdf:predicate rdf:resource='http://www.example.com/terms/weight' />
  <rdf:object rdf:datatype='&xsd:decimal'>2.4</rdf:object>

  <dc:creator rdf:resource='http://www.example.com/staffid/85740' />
</rdf:Statement>
```

- This lets you say things about who wrote a statement, when it was added, the validity, and so on.

17-12: FOAF

- We'll be using a simple RDF language called FOAF (friend-of-a-friend)
- It's a way to indicate other people that you know.
- Consists of Person nodes, which have properties
 - Name, title, etc.
- One of the interesting properties is 'knows'.
- the object of this is also a Person.