

RDFa:

Embedding RDF Knowledge in HTML

Some content from a presentation by Ivan Herman of the W3c, [Introduction to RDFa](#), given at the 2011 Semantic Technologies Conference.

What is RDFa?

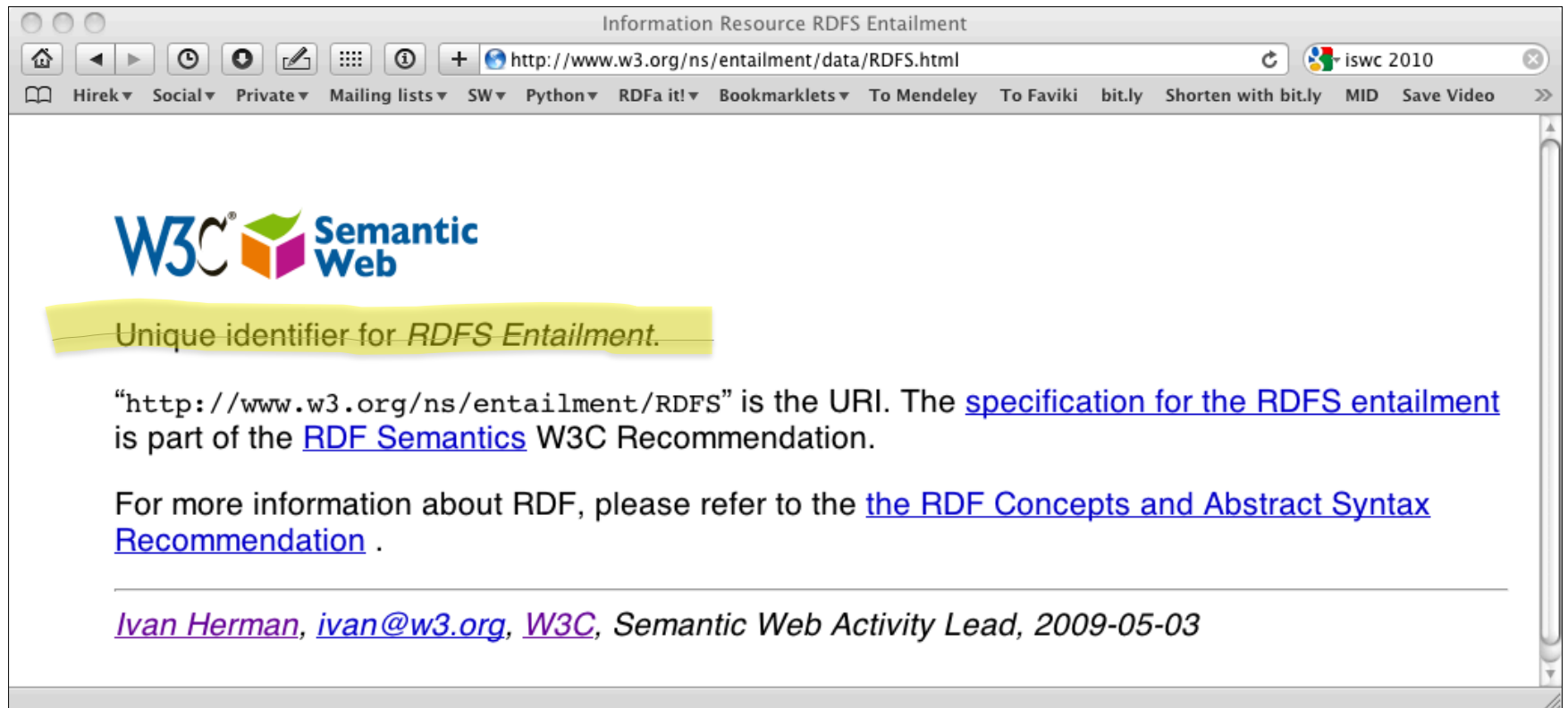


- Simple idea: a serialization of RDF embedded in XHTML, HTML or XML
 - Provides a set of attributes (the *a* in RDFa) to use with existing tags to carry the RDF metadata
- 2004: work on developing standards began
- 2008: RDFa 1.0 a recommendation
 - Worked only in XHTML, which did not catch on
- 2012: RDFa 1.1 a recommendation
 - Works in HTML4, HTML5 and XHTML
- See <http://rdfa.info/>

Principles of RDFa

- RDF content specified in XML *attributes* of tags rather than *elements*
 - The XML/HTML *tree structure* is used as context, when appropriate
 - Some new attributes are *introduced* and some existing ones (@href, @rel) *reused*
 - When possible, HTML text content is used for *literal values*
- ➔ Same file used by browser & RDF extractor

Web page viewed by a person



<http://www.w3.org/ns/entailment/data/RDFS.html>

The source

```
<p about="http://www.w3.org/ns/entailment/RDFS"  
  property="http://purl.org/dc/terms/description">  
  Unique identifier for RDFS Entailment.</p>
```

Source and generated RDF...

```
<p about="http://www.w3.org/ns/entailment/RDFS"  
  property="http://purl.org/dc/terms/description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>
```

```
<http://www.w3.org/ns/entailment/RDFS>
```

```
... .
```

Source and generated RDF...

```
<p about="http://www.w3.org/ns/entailment/RDFS"  
  property="http://purl.org/dc/terms/description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>
```

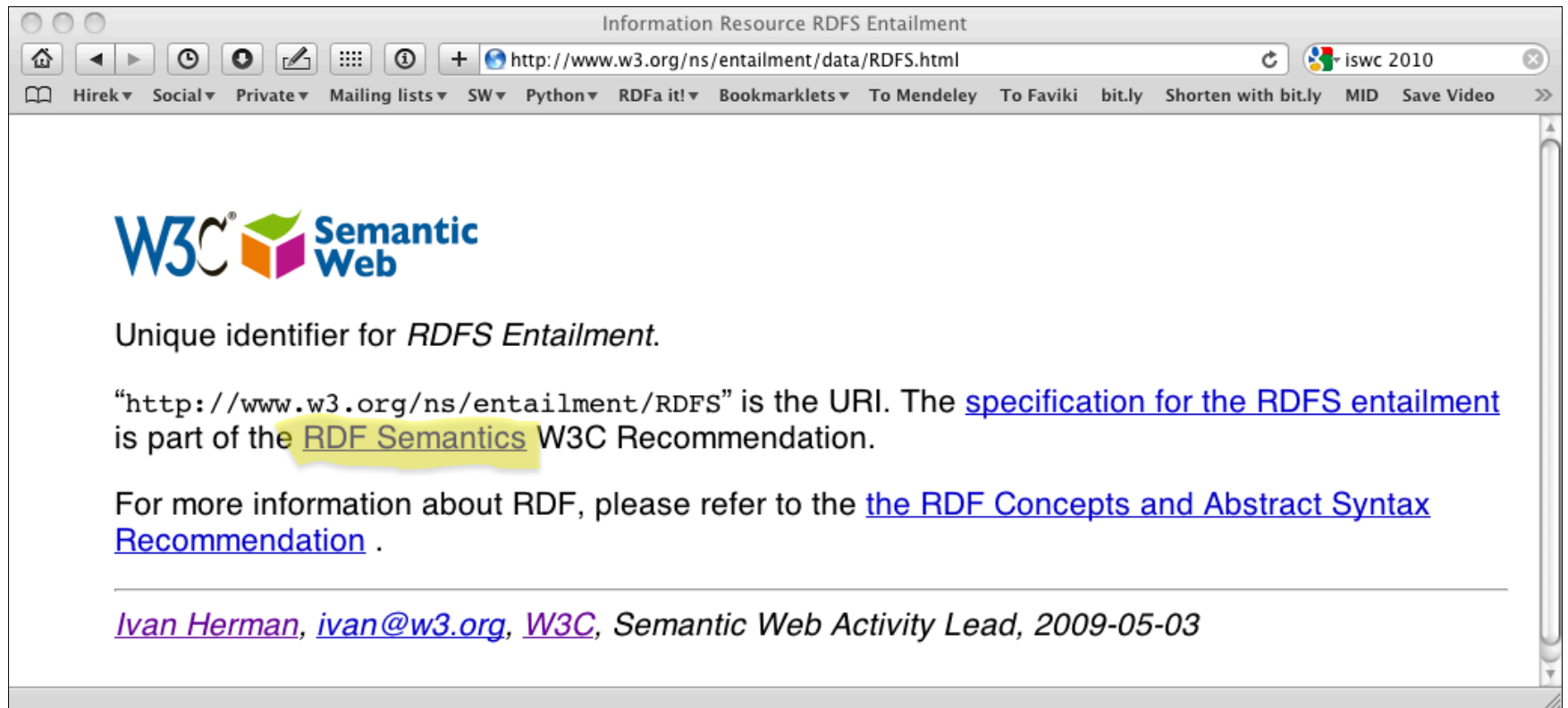
```
<http://www.w3.org/ns/entailment/RDFS>  
  <http://purl.org/dc/terms/description>  
  ... .
```

Source and generated RDF...

```
<p about="http://www.w3.org/ns/entailment/RDFS"  
  property="http://purl.org/dc/terms/description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>
```

```
<http://www.w3.org/ns/entailment/RDFS>  
  <http://purl.org/dc/terms/description>  
    "Unique identifier for RDFS Entailment." .
```


The Web page viewed by a person



The source

```
<a about="http://www.w3.org/ns/entailment/RDFS"  
  rel="http://www.w3.org/2000/01/rdf-schema#seeAlso"  
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210/">  
  RDF Semantics.  
</a>
```

Source and generated RDF...

```
<a about="http://www.w3.org/ns/entailment/RDFS"  
  rel="http://www.w3.org/2000/01/rdf-schema#seeAlso"  
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210/">  
  RDF Semantics.  
</a>
```

```
<http://www.w3.org/ns/entailment/RDFS>
```

```
...
```

Source and generated RDF...

```
<a about="http://www.w3.org/ns/entailment/RDFS"  
  rel="http://www.w3.org/2000/01/rdf-schema#seeAlso"  
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210/">  
  RDF Semantics.  
</a>
```

```
<http://www.w3.org/ns/entailment/RDFS>  
  <http://www.w3.org/2000/01/rdf-schema#seeAlso>  
  ... .
```

Source and generated RDF...

```
<a about="http://www.w3.org/ns/entailment/RDFS"  
  rel="http://www.w3.org/2000/01/rdf-schema#seeAlso"  
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210/">  
  RDF Semantics.  
</a>
```

```
<http://www.w3.org/ns/entailment/RDFS>  
  <http://www.w3.org/2000/01/rdf-schema#seeAlso>  
    <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> .
```

We have Ntriples in HTML

- Maybe we can do better, instead of this

```
<http://www.w3.org/ns/entailment/RDFS>  
  <http://purl.org/dc/terms/description>  
    "Unique identifier for RDFS Entailment." .  
<http://www.w3.org/ns/entailment/RDFS>  
  <http://www.w3.org/2000/01/rdf-schema#seeAlso>  
    <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> .
```

- Allow URI prefixes and shared subject, like this

```
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .  
@prefix dcterms: <http://purl.org/dc/terms/> .  
  
<http://www.w3.org/ns/entailment/RDFS>  
  rdfs:seeAlso <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> ;  
  dcterms:description "Unique identifier for RDFS Entailment." .
```

Turtlizing RDFa

- Turtle supports several simplifying ideas
- Use compact URIs when possible
 - A CURIE or compact URI, typically a URI with a prefix defined elsewhere, e.g., *foaf:mbox*
- Making use of the natural structure for
 - shared subjects
 - shared predicates
 - creating blank nodes
 - ...

CURIE definition and usage

```
<html>
...
<p about="http://www.w3.org/ns/entailment/RDFS"
  property="http://purl.org/dc/terms/description">
  Unique identifier for RDFS Entailment.
```

- can be replaced by:

```
<html prefix="dcterms: http://purl.org/dc/terms/">
...
<p about="http://www.w3.org/ns/entailment/RDFS"
  property="dcterms:description">
  Unique identifier for RDFS Entailment.
```


Details on @prefix in RDFa

- Can be anywhere in the tree and is valid for the whole sub-tree
 - i.e., html element is not the only place to have it
- The same @prefix attribute can hold several definitions:
 - prefix="dcterm: http://purl.org... foaf: http://..."
- CURIEs and “real” URIs can usually be mixed
- CURIEs *cannot* be used on @href

Sharing subjects

The basic principle: @about is inherited by children nodes, so there's no reason to repeat it

```
<html prefix="dcterms: http://purl.org/dc/terms/  
        rdfs: http://www.w3.org/2000/01/rdf-schema#">  
...  
<body about="http://www.w3.org/ns/entailment/RDFS">  
...  
<p property="dcterms:description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>  
<p>...<a rel="rdfs:seeAlso"  
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">  
  RDFS Semantics</a>...</p>
```

... yielding

```
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
```

```
@prefix dcterms: <http://purl.org/dc/terms/> .
```

```
<http://www.w3.org/ns/entailment/RDFS>
```

```
  rdfs:seeAlso <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> ;
```

```
  dcterms:description "Unique identifier for RDFS Entailment." .
```

On reusing literals

- Reusing literals is a plus, but you don't always want to do it
- The basic rule says: the (RDF) Literal is the enclosed text from the HTML content
- This is fine in 80% of the cases, but...
- ...it may not be natural in many cases!

Example: dates

```
<body about=".." prefix="dcterms: http://... xsd: http://..."  
  <address>  
    <p property="dcterms:date" datatype="xsd:date">2010-07-05</p>  
  </address>  
</body>
```

- This leads to:

```
@prefix dcterms: <http://...> .  
@prefix xsd: <http://...> .  
<..> dcterms:date "2010-07-05"^^xsd:date .
```

- 2010-07-05 is the official ISO format (for xsd:date) but “July 5, 2010” is preferred by people

Usage of @content

```
<body about=".." prefix="dcterms: http://... xsd: http://..."  
  <address>  
    <p property="dcterms:date" datatype="xsd:date"  
      content="2010-07-05">July 5, 2010</p>  
  </address>  
</body>
```

- Also leads to:

```
@prefix dcterms: <http://...> .  
@prefix xsd: <http://...> .  
<...> dcterms:date "2010-07-05"^^xsd:date .
```

On subjects and objects

- Here is our rule so far
 - @about sets the subject
 - @href sets the object
- But that is not always good enough
 - We may not want to introduce an active link (i.e., "a" element) on the web page
 - what about other links in HTML?

We may not always want links...

- The RDFa `@resource` attribute is equivalent to `@href`
- Sets the object, just like `@href` but is ignored by browsers, e.g.,:

```
<span about="http://www.ivan-herman.net/foaf#me">  
  <span rel="rdfs:seeAlso"  
    resource="http://www.w3.org/People/Ivan/">Activity Lead</span>  
</span>
```


More features

- RDFa1.1 has more features that make it easier to represent knowledge compactly in HTML
- These take advantage of the HTML tree context
- See the hidden slides if you are interested

Chaining

- Here is what we would like to have in RDFa

```
<http://www.w3.org/ns/entailment/RDFS>  
  dct:creator <http://www.ivan-herman.net/foaf#me> .
```

```
<http://www.ivan-herman.net/foaf#me>  
  foaf:mailbox <mailto:ivan@w3.org> ;  
  foaf:workplaceHomepage <http://www.w3.org> .
```

Chaining

- A straightforward way:

```
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<address>
  <span rel="dcterms:creator"
    resource="http://www.ivan-herman.net/foaf#me"/>
  <span about="http://www.ivan-herman.net/foaf#me">
    <a rel="foaf:mailbox"
      href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="foaf:workplaceHomepage"
      href="http://www.w3.org">W3C</a>
  </span>
</address>
```

Chaining

- A straightforward way:

```
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<address>
  <span rel="dcterms:creator"
    resource="http://www.ivan-herman.net/foaf#me"/>
  <span about="http://www.ivan-herman.net/foaf#me">
    <a rel="foaf:mailbox"
      href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="foaf:workplaceHomepage"
      href="http://www.w3.org">W3C</a>
  </span>
</address>
```

Chaining: when objects become subjects

- An alternative:

```
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<address>
  <span rel="dcterms:creator"
    resource="http://www.ivan-herman.net/foaf#me">
    <a rel="foaf:mailbox"
      href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="foaf:workplaceHomepage"
      href="http://www.w3.org">W3C</a>
  </span>
</address>
```

Chaining means

- @resource (or @href) becomes a subject *for the sub-tree*
- This feature is a bit like in RDF/XML

Some extra features

- Blank nodes can be created using “_:XX”
- Shorthand for RDF types
- Helping single-vocabulary cases
- Profiles

Typing

- Typing can of course be done using `@rel="rdf:type"`
- But that is a widely used combination, so there is a separate `@typeof` attribute for that

Typing example

```
<span about="http://www.ivan-herman.net/foaf#me"  
  typeof="foaf:Person">  
  <span property="foaf:name">Ivan Herman</span>  
</span> ,
```

- yields

```
<http://www.ivan-herman.net/foaf#me> a foaf:Person ;  
  foaf:name "Ivan Herman" .
```

Single-vocabulary case

- In many cases the content is dominated by one vocabulary, e.g., dcterms, foaf, etc.
- CURIEs and URIs use is intuitive for RDF people but *not* for average HTML authors!
- Solution:
 - define a vocabulary URI for a sub-tree
 - for that sub-tree, simple *terms* in @rel, @property, etc., are automatically expanded into a full URI using the vocabulary

@vocab and terms: this...

```
<div prefix="foaf: http://xmlns.com/foaf/0.1/">
...
<address about="http://www.ivan-herman.net/foaf#me"
  typeof="foaf:Person">
  <span property="foaf:name">Ivan Herman</span>,
  <a rel="foaf:mailbox"
    href="mailto:ivan@w3.org">ivan@w3.org</a>,
  <a rel="foaf:workplaceHomepage"
    href="http://www.w3.org">W3C</a>
</address>
```

...becomes

```
<div vocab="http://xmlns.com/foaf/0.1/">
...
  <address about="http://www.ivan-herman.net/foaf#me"
    typeof="Person">
    <span property="name">Ivan Herman</span>,
    <a rel="mailbox"
      href="mailto:ivan@w3.org">ivan@w3.org</a>,
    <a rel="workplaceHomepage"
      href="http://www.w3.org">W3C</a>
  </address>
```

...becomes

```
<div vocab="http://xmlns.com/foaf/0.1/">
...
<address about="http://www.ivan-herman.net/foaf#me"
  typeof="Person">
  <span property="name">Ivan Herman</span>,
  <a rel="mailbox"
    href="mailto:ivan@w3.org">ivan@w3.org</a>,
  <a rel="workplaceHomepage"
    href="http://www.w3.org">W3C</a>
</address>
```

...becomes

```
<div vocab="http://xmlns.com/foaf/0.1/">
...
<address about="http://www.ivan-herman.net/foaf#me"
  typeof="Person">
  <span property="name">Ivan Herman</span>,
  <a rel="mailbox"
    href="mailto:ivan@w3.org">ivan@w3.org</a>,
  <a rel="workplaceHomepage"
    href="http://www.w3.org">W3C</a>
</address>
```

Profile files

- Prefix and term declarations can be collected in a separate file and referred to via a @profile attribute pointing to the file
- Say, file “http://ex.org/prof” defines
 - prefix mappings:
 - "foaf" → "http://xmlns.com/foaf/0.1/"
 - "rdfs" → <http://www.w3.org/2000/01/rdf-schema#>
 - term mapping:
 - "desc" → <http://purl.org/dc/terms/description>

Profile usage example: this...

```
<html prefix="dcterms: http://purl.org/dc/terms/  
        rdfs: http://www.w3.org/2000/01/rdf-schema#">  
...  
<body about="http://www.w3.org/ns/entailment/RDFS">  
...  
<p property="dcterms:description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>  
<p>...<a rel="rdfs:seeAlso"  
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">  
  RDFS Semantics</a>...</p>  
...  
<address about="http://www.ivan-herman.net/foaf#me">  
  <span property="foaf:name">Ivan Herman</span>,  
...
```


...becomes

```
<html profile="http://ex.org/prof">
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<p property="desc">
  Unique identifier for <em>RDFS Entailment</em>.</p>
<p>...<a rel="rdfs:seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
  RDFS Semantics</a>...</p>
...
<address about="http://www.ivan-herman.net/foaf#me">
  <span property="foaf:name">Ivan Herman</span>,
...
```

...becomes

```
<html profile="http://ex.org/prof">
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<p property="desc">
  Unique identifier for <em>RDFS Entailment</em>.</p>
<p>...<a rel="rdfs:seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
  RDFS Semantics</a>...</p>
...
<address about="http://www.ivan-herman.net/foaf#me">
  <span property="foaf:name">Ivan Herman</span>,
...
```

Default profiles

- Even usage of profiles might be “too much” for many HTML authors 😞
 - authors will forget to add the @profile declaration
- RDFa defines *default profiles*:
 - RDFa clients include these profiles automatically

Default profiles

- Default for RDFa in general
 - <http://www.w3.org/profile/rdfa-1.1>
 - includes some widely used prefixes (rdf, rdfs, vcard, og, foaf, dc, or dcterms are typical candidates)
 - the profile is to be updated regularly by *adding* new prefixes
- Default for (X)HTML
 - <http://www.w3.org/profile/html-rdfa-1.1>
 - includes the HTML4 @rel values (next, up, license, ...)
 - the profile is to be updated regularly by *adding* @rel values as they evolve in the HTML world

So this...

```
<html profile="http://ex.org/prof">  
...  
<body about="http://www.w3.org/ns/entailment/RDFS">  
...  
<p property="dcterms:description">  
  Unique identifier for <em>RDFS Entailment</em>.</p>  
<p>...<a rel="rdfs:seeAlso"  
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">  
  RDFS Semantics</a>...</p>
```

...becomes:

```
<html>
...
<body about="http://www.w3.org/ns/entailment/RDFS">
...
<p property="dcterms:description">
  Unique identifier for <em>RDFS Entailment</em>.</p>
<p>...<a rel="rdfs:seeAlso"
  href="http://www.w3.org/TR/2004/REC-rdf-mt-20040210">
  RDFS Semantics</a>...</p>
```

Authoring RDFa

- Some tools already have RDFa facilities:
 - e.g., it is possible to add the right DTD to Dreamweaver, Amaya has it at its core, etc.
- There are plugins to, e.g., WordPress, to generate RDFa markup
- CMS systems (like Drupal 7) may have RDFa built in their publication system
 - users generate RDFa whether they know about it or not...

Consuming RDFa

- Major search engines (Google, Yahoo) process RDFa for vocabularies they understand can use
- There are libraries, distillers, etc., to extract RDFa information
 - may be part of RDF development environments like Redland, RDFLib
 - see, for further references, <http://rdfa.info/wiki/Consume>
- Facebook’s “social graph” is based on RDFa

Publishing RDFa

- RDFa+HTML file can just be on a server
 - the client extracts the RDF content
- Content negotiations can be set up on the server side
 - the client gets the format he/she asks for
 - the RDF content can either be generated on the fly or stored on the server statically

Google's rich snippets

Embedded metadata (microdata or RDFa) is used to improve search result page

- at the moment only a few vocabularies are recognized, but that will evolve over the years



The screenshot shows a Google search interface. The search bar contains the text "chicken noodle soup recipes". Below the search bar, it indicates "About 1,150,000 results (0.26 seconds)". Two search results are visible. The first result is from "Cooks.com" and is titled "Cooks.com - Recipes - Homemade Chicken Noodle Soup". Below the title, there is a snippet: "Enter your email to signup for the Cooks.com Recipe Newsletter. ... H NOODLE SOUP: Put chicken and all seasonings in a ... are soft. ... www.cooks.com > Recipes - Cached - Similar". The second result is from "Allrecipes.com" and is titled "Grandma's Chicken Noodle Soup Recipe - Allrecipes.com". This title is circled in red. Below the title, there is a star rating of five stars, followed by "561 reviews - Prep time: 20 mins - Cook time: 25 mins". Below the star rating, there is a snippet: "This is a **recipe** that was given to me by my grandmother. It is a very and I believe that all will like it."

Effects of, e.g., Google of Facebook

A number of popular sites publish RDFa as part of their normal pages:

- Tesco, BestBuy, Slideshare, The London Gazette, Newsweek, MSNBC, O'Reilly Catalog, the White House...
- Creative Commons snippets are in RDFa (e.g., on Flickr)

BestBuy xxample of RDFa use

My Account | Order Status | Customer Service | Español


BEST BUY Weekly Ad Store Locator Outlet Center Services Gifts cart Items

TV & VIDEO AUDIO CAR & GPS CAMERAS & CAMCORDERS COMPUTERS MOBILE PHONES & OFFICE MUSIC, MOVIES & BOOKS VIDEO GAMES & GADGETS HOME & APPLIANCES

Search All Categories Keyword or Item # GO Credit Cards Reward Zone®

Best Buy - Carbondale

Print



1270 E Main St
Carbondale, IL 62901
Phone: 618-351-1700
GEO: 37.732719, -89.192314


Customer Reviews:
☆☆☆☆☆
Be the first to write a store review.

[Maps & Directions](#) | [Weekly Ad](#)

Store Hours
Mon: 10-9; Tue: 10-9; Wed: 10-9; Thurs: 10-9; Fri: 10-9; Sat: 10-9; Sun: 11-7;
4/4 - 4/10, 2010
Mon: 10-9; Tues: 10-9; Wed: 10-9; Thurs: 10-9; Fri: 10-9; Sat: 10-9; Sun: Closed

Events

Avatar Midnight Release!



The biggest movie of 2009 is coming to Best Buy on April 22nd! Carbondale Best Buy is hosting a special midnight release! We will open the doors at 12:00am on 4/22! We'll have door prizes including movie posters available only to those in attendance at the midnight release! Local band "Ravenhill" will be playing, as well! You don't want to miss this special event! Check back for more information as we get closer to the release date!

Local Selections

Check out these special product selections at our store.

Open Box Items (25)

At This Location

- Geek Squad**
Computer setup & services, plus home theater, appliance and car installation.
- Best Buy Mobile**
Get informed advice from noncommissioned mobile phone specialists.
- Small Business Solutions**
Featuring Professional Series products and trained staff to help with small business needs.
- Apple Shop**
Mac, iPod and more at this Apple store-within-a-store.
- Electronics Recycling**
We offer electronics recycling at this and all other U.S. stores.

BestBuy example of RDFa Use


My Account | Order Status | Customer Service | Español

BEST BUY Weekly Ad Store Locator Outlet Center Services Gifts cart Items

TV & VIDEO AUDIO CAR & GPS CAMERAS & CAMCORDERS COMPUTERS MOBILE PHONES & OFFICE MUSIC, MOVIES & BOOKS VIDEO GAMES & GADGETS HOME & APPLIANCES

Search [All Categories] <div class="fn n" property="foaf:name rdfs:label vcard:fn gr:legalName"> Reward Zone</div><h1 class="org" property="geo:lat_long" content="37.732719,-89.192314">Best Buy - Carbondale</h1></div>

Best Buy - Carbondale Print



1270 E Main St
Carbondale, IL 62901
Phone: 618-351-1700
GEO: 37.732719, -89.192314

Customer Reviews:
☆☆☆☆☆
Be the first to write a store review.

See also foaf:deprecation" data-bbox="278 535 515 585">

Store Hours
Mon: 10-9; Tue: 10-9; Wed: 10-9; Thurs: 10-9; Fri: 10-9; Sat: 10-9; Sun: 11-7;

See also gr:hasOpeningHoursSpecification" data-bbox="278 645 545 795"><div class="hours" rel="gr:hasOpeningHoursSpecification"><div typeof="gr:OpeningHoursSpecification" about="#regularhours">Mon: 109</div></div>

The biggest movie of 2009 is coming to Best Buy on April 22nd! Carbondale Best Buy is hosting a special midnight release! We will open the doors at 12:00am on 4/22! We'll have door prizes including movie posters available only to those in attendance at the midnight release! Local band "Ravenhill" will be playing, as well! You don't want to miss this special event! Check back for more information as we get closer to the release date!

See also vcard:adr" data-bbox="555 425 725 715"><div class="adr" rel="vcard:adr"><div typeof="vcard:Address"><div class="street-address" property="vcard:street-address">1270 E Main St</div>Carbondale, IL 62901 </div><div class="tel">Phone: 618-351-1700</div><div class="geo" rel="vcard:geo">GEO: 37.732719, 89.192314</div>

Apple Shop
Mac, iPod and more at this Apple store-within-a-store.

Electronics Recycling
We offer electronics recycling at this and all other U.S. stores.

Effects on BestBuy

- Reported in a BestBuy blog:
 - GoodRelations+RDFa improved Google rank tremendously
 - 30% increase in traffic on BestBuy store pages
 - Yahoo observers a 15% increase in click-through rate
- Today, BestBuy uses RDFa for much more than just snippets
 - E.g., to locate shops that have certain products on stock...

Library of Congress RDFa use

Semantic Web

From Library of Congress Subject Headings

Details

Visualization

Suggest Terminology

Semantic Web

URI

<<http://id.loc.gov/authorities/sh2002000569#concept>>

Type

Topical Term

Broader Terms

- > [Semantic integration \(Computer systems\)](#)
- > [Semantic networks \(Information theory\)](#)
- > [World Wide Web](#)

Related Terms

- > [Microformats](#)

Sources

- > Engr. index online, May 6, 2002 (identifier: Semantic Web)
- > ASTI on FirstSearch, May 6, 2002: in titles (semantic Web)
- > Work cat.: 2002070545: The Semantic Web--ISWC 20002, 2002.

LC Classification

TK5105.88815

Library of Congress RDFa use

```
Source of http://id.loc.gov/authorities/sh2002000569
<p rel="skos:inScheme" resource="http://id.loc.gov/authorities#topicalTerms">topical
Term</p>
  </li>
  <li>
    <h3>Broader Terms</h3>
    <ul class="std">
      <li>
        <a href="http://id.loc.gov/authorities/sh2004000479#concept" rel="skos:broader">
          <span property="skos:prefLabel" xml:lang="en">Semantic integration (Computer
systems)</span>
        </a>
      </li>
      <li>
        <a href="http://id.loc.gov/authorities/sh92004914#concept" rel="skos:broader">
          <span property="skos:prefLabel" xml:lang="en">Semantic networks (Information
theory)</span>
        </a>
      </li>
      <li>
        <a href="http://id.loc.gov/authorities/sh95000541#concept" rel="skos:broader">
          <span property="skos:prefLabel" xml:lang="en">World Wide Web</span>
        </a>
      </li>
    </ul>
  </li>
```


Overstock.com example

Shopping Community Cars Real Estate Auctions We Recommend My Account


Welcome To **overstocktober™**
11 Years

Free Shipping on yo

Shop All Departments

Online Shopping Electronics Cameras & Photo Camcorders Digital Camcorders

Photos



Bell and Howell DV550UW 12MP Digital Video Camera with Underwater Housing

Rating 3.8 ★★★★★ 10 reviews
Read Reviews / Write a review

Today: \$68.99

Get 5% Back with Club O
View Details

Brief Description Item#: 12403958

- Take great videos with the Bell + Howell digital video camera
- Digital video camera has ultra compact body and features a flip-up USB
- Camcorder includes waterproof underwater housing to take video underwater (up to 33 ft)

Sold out!


This product is not in stock.
We will notify you when this product is in stock.
Please enter your email address below, then

Compare to these
This?

ADORAMA
The Photography People

TigerDirect


People Who Viewed




SVP Underwater 5MP Digital Video Camera
Today: \$75.99
Reviews

Overstock.com example

 Shopping

 Community

 Cars

 Real Estate

 Auctions

We Recommend My Account



Free Shipping on yo

Shop All Departments

```
http://www.w3.org/2007/08/pyRdfa/extract?format=turtle&uri=http%3A//www.overstock.co...d-Howell-DV550UW-12MP-Digital-Video-Camera-with-Underwater-Housing/4450313/product.html#myoffer> .
```

```
<http://www.overstock.com/Electronics/Bell-and-Howell-DV550UW-12MP-Digital-Video-Camera-with-Underwater-Housing/4450313/product.html#myoffer> v:count "10" .
```

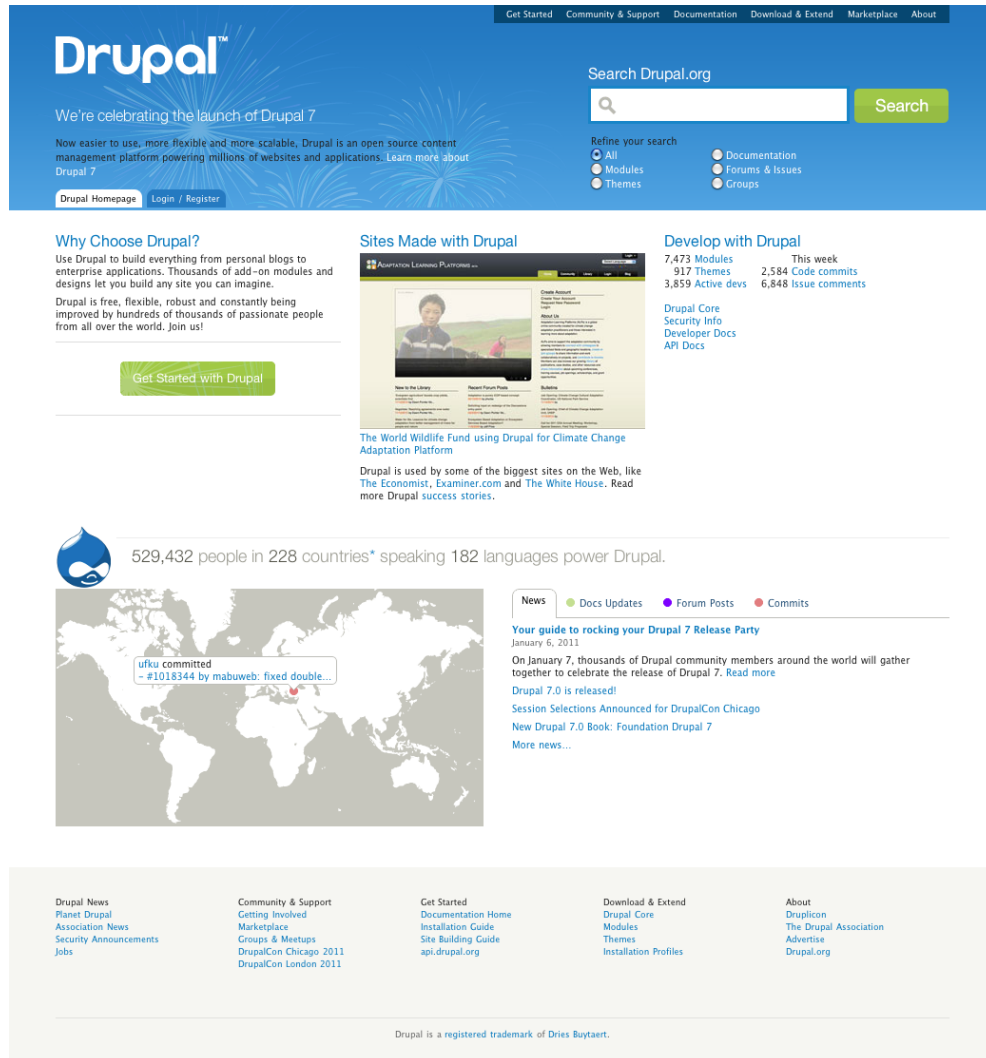
```
<http://www.overstock.com/Electronics/Bell-and-Howell-DV550UW-12MP-Digital-Video-Camera-with-Underwater-Housing/4450313/product.html#myoffer> xhv:icon <http://ak1.ostkcdn.com/favicon.ico> ;
xhv:stylesheet <http://ak1.ostkcdn.com/css/ProductPageC.css>, <http://ak1.ostkcdn.com/css/os_master.less>, <http://ak1.ostkcdn.com/css/productPageImgGallery.css> .
```

```
<http://www.overstock.com/Electronics/Bell-and-Howell-DV550UW-12MP-Digital-Video-Camera-with-Underwater-Housing/4450313/product.html#TypeAndQuantityNode> a gr:TypeAndQuantityNode ;
gr:hasUnitOfMeasurement "C62"^^xsd:string ;
gr:typeOfGood <http://www.overstock.com/Electronics/Bell-and-Howell-DV550UW-12MP-Digital-Video-Camera-with-Underwater-Housing/4450313/product.html#product> .
```

```
<http://www.overstock.com/Electronics/Bell-and-Howell-DV550UW-12MP-Digital-Video-Camera-with-Underwater-Housing/4450313/product.html#UnitPriceSpecification> a gr:UnitPriceSpecification .
```

```
<http://www.overstock.com/Electronics/Bell-and-Howell-DV550UW-12MP-Digital-Video-Camera-with-Underwater-Housing/4450313/product.html#myoffer> a gr:Offering ;
gr:hasBusinessFunction gr:Sell ;
gr:hasPriceSpecification
[ gr:hasCurrency "USD"^^xsd:string ;
  gr:hasCurrencyValue "68.99"^^xsd:float
] <http://www.overstock.com/Electronics/Bell-and-Howell-DV550UW-12MP-Digital-Video-Camera-with-Underwater-Housing/4450313/product.html#UnitPriceSpecification> .
```

Drupal content management system



The screenshot shows the Drupal 7 homepage with a blue header. The main content area is divided into several sections: 'Why Choose Drupal?' with a 'Get Started with Drupal' button, 'Sites Made with Drupal' featuring a screenshot of a website and a link to 'The World Wildlife Fund using Drupal for Climate Change Adaptation Platform', and 'Develop with Drupal' with statistics on modules, themes, active developers, code commits, and issue comments. A 'News' section highlights the 'Drupal 7.0 Release Party' on January 6, 2011. A world map shows the global reach of Drupal with 529,432 users in 228 countries. The footer contains navigation links for news, support, getting started, download, and about.

Drupal™

We're celebrating the launch of Drupal 7

Now easier to use, more flexible and more scalable, Drupal is an open source content management platform powering millions of websites and applications. [Learn more about Drupal 7](#)

[Drupal Homepage](#) [Login](#) / [Register](#)

Search Drupal.org

Refine your search

- All
- Modules
- Themes
- Documentation
- Forums & Issues
- Groups

Why Choose Drupal?

Use Drupal to build everything from personal blogs to enterprise applications. Thousands of add-on modules and designs let you build any site you can imagine.

Drupal is free, flexible, robust and constantly being improved by hundreds of thousands of passionate people from all over the world. [Join us!](#)

[Get Started with Drupal](#)

Sites Made with Drupal

[The World Wildlife Fund using Drupal for Climate Change Adaptation Platform](#)

Drupal is used by some of the biggest sites on the Web, like [The Economist](#), [Examiner.com](#) and [The White House](#). [Read more Drupal success stories.](#)

Develop with Drupal

7,473 Modules	This week
917 Themes	2,584 Code commits
3,859 Active devs	6,848 Issue comments

[Drupal Core](#)
[Security Info](#)
[Developer Docs](#)
[API Docs](#)

529,432 people in 228 countries* speaking 182 languages power Drupal.

News

- Docs Updates
- Forum Posts
- Commits

Your guide to rocking your Drupal 7 Release Party

January 6, 2011

On January 7, thousands of Drupal community members around the world will gather together to celebrate the release of Drupal 7. [Read more](#)

[Drupal 7.0 is released!](#)

[Session Selections Announced for DrupalCon Chicago](#)

[New Drupal 7.0 Book: Foundation Drupal 7](#)

[More news...](#)

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[Installation Guide](#)
[Site Building Guide](#)
[api.drupal.org](#)

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[Drupicon](#)
[The Drupal Association](#)
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Drupal is a registered trademark of Dries Buytaert.

- RDF support in Drupal v. 7
- Major CMS system
- Has RDF at his core, pages contain RDFa
- In one step millions of pages of additional RDF data!

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Log In

Sheriff Dupnik names Angle and Palin as two responsible for 'vitriol' (Video)



Yesterday Pima County Sheriff Charles Dupnik took the bold step of naming Sharon Angle and Sarah Palin as two individuals responsible for the kind of toxic 'political vitriol' which he believes must end in light of the recent shooting in Tucson, Arizona. Dupnik's comments came in an interview with Geraldo Rivera of Fox News. Earlier in the day Dupnik had been interview by Megyn Kelly of Fox News, who accused the Sheriff of inserting politics where it did not belong. In the Rivera interview, Dupnik stands by his earlier comments, and goes further in identifying two Republicans as the source...

Ryan Witt
Political Buzz Examiner
[Browse more Politics articles](#)

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SLIDESHOW

SLIDESHOW

Sheriff Dupnik names Angle and Palin as two responsible...

Missed field goals by Eagles kicker David Akers makes him...

FDA outlawing natural cancer cure to further destroy...

Eco-Travel Tip: Use an e-book reader to lighten your...

Lyndon Johnson and the Great Society...

The Examiner.com

Sheriff Dupnik for 'vitriol' (Video)



Sheriff Dupnik names
Angle and Palin as two
responsible...

Missed
Eagles
Akers

```
http://www.w3.org/2007/08/pyRdfa/extract?format=turtle&uri=http%3A//www.examiner.com/national
http://www.w3.org/2007/08/pyRdfa/extract?format=tl
the examiner
Feeds Reader Social Private Mailing lists SW Python RDFa it! Bookmarklets bit.ly To Faviki Add Zemanta tags To Mendeley
Log In
<http://www.examiner.com/sports-twitter-in-national/missed-field-goals-by-eagles-kicker-david-akers-makes-him-popular-
twitter-trend>;
xhv:icon <http://cdn2-b.examiner.com/sites/all/themes/base/favicon.ico>;
xhv:stylesheet
<http://cdn2-b.examiner.com/sites/default/files/css/css_0j_8rZyEn4LW_6vfrH9Lk3SF1pAp1tBETwGkdYgucs_18.css>;
<http://cdn2-b.examiner.com/sites/default/files/css/css_2xhXDFX6AKESGrCwSeGy_SwFPESHaCkyJn35Kk9ecM_18.css>;
<http://cdn2-b.examiner.com/sites/default/files/css/css_L1V30UAWV2kWDs1F7U18UMZxdAvyTakCHPN2gR11JEM_18.css>;
<http://cdn2-b.examiner.com/sites/default/files/css/css_T617aJmFY3qgtxCh-hLpMKK1g9aLzWqMh5exPR06t8_18.css>;
<http://cdn2-b.examiner.com/sites/default/files/css/css_s28NQukDms5n0K5_mf-MYwExoy4rLZ16V280vQwx340Q_18.css>.
<http://www.examiner.com/national/discuss/an-offer-to-the-republican-party> a sioc:Item, foaf:Document ;
dc:title "An Offer to the Republican Party"@en ;
xhv:bookmark <http://www.examiner.com/national/discuss/an-offer-to-the-republican-party> .
<http://www.examiner.com/national/discuss/chicago-s-bill-daley-becomes-obama-s-newest-chief-of-staff> a sioc:Item, foaf:Document ;
dc:title "Chicago's Bill Daley becomes Obama's newest Chief of Staff"@en ;
xhv:bookmark <http://www.examiner.com/national/discuss/chicago-s-bill-daley-becomes-obama-s-newest-chief-of-staff> .
<http://www.examiner.com/national/discuss/could-the-mass-dead-fish-dead-bird-cases-be-a-case-of-over-reporting> a sioc:Item,
foaf:Document ;
dc:title "Could the mass dead fish, dead bird cases be a case of over-reporting?"@en ;
xhv:bookmark <http://www.examiner.com/national/discuss/could-the-mass-dead-fish-dead-bird-cases-be-a-case-of-over-reporting> .
<http://www.examiner.com/national/discuss/death-and-dignity-hospice-caregiver-advice-for-end-of-life-process> a sioc:Item,
foaf:Document ;
dc:title "Death and dignity: Hospice caregiver advice for end of life process"@en ;
xhv:bookmark <http://www.examiner.com/national/discuss/death-and-dignity-hospice-caregiver-advice-for-end-of-life-process> .
<http://www.examiner.com/national/discuss/exclusive-interview-with-naomi-judd-on-alternative-pain-management> a sioc:Item,
foaf:Document ;
dc:title "Exclusive interview with Naomi Judd on Alternative Pain Management"@en ;
xhv:bookmark <http://www.examiner.com/national/discuss/exclusive-interview-with-naomi-judd-on-alternative-pain-management> .
<http://www.examiner.com/national/discuss/if-given-a-choice-at-the-rental-counter-would-you-rent-the-chevy-volt> a sioc:Item,
foaf:Document ;
dc:title "If given a choice at the rental counter, would you rent the Chevy Volt?"@en ;
xhv:bookmark <http://www.examiner.com/national/discuss/if-given-a-choice-at-the-rental-counter-would-you-rent-the-chevy-volt> .
<http://www.examiner.com/national/discuss/introducing-the-next-tim-mcveigh> a sioc:Item, foaf:Document ;
dc:title "Introducing - the Next Tim McVeigh"@en ;
xhv:bookmark <http://www.examiner.com/national/discuss/introducing-the-next-tim-mcveigh> .
<http://www.examiner.com/national/discuss/is-the-reality-of-climate-change-still-question> a sioc:Item, foaf:Document ;
dc:title "Is the reality of climate change still in question?"@en ;
xhv:bookmark <http://www.examiner.com/national/discuss/is-the-reality-of-climate-change-still-question> .
<http://www.examiner.com/national/discuss/was-the-reading-of-the-u-s-constitution-congress-beneficial> a sioc:Item, foaf:Document ;
```

Extracting the data


```
rdfa> python getdata.py "http://www.w3.org/ns/entailment/data/RDFS.html"
@prefix dc: <http://purl.org/dc/terms/> .
@prefix ent: <http://www.w3.org/ns/entailment/> .
...
ent:RDFS a ent:Entailment ;
  dc:creator <http://www.ivan-herman.net/foaf#me> ;
  dc:date "2010-05-03"^^xsd:date ;
  dc:description "Unique identifier for RDFS Entailment" ;
  rdfs:comment "The specification for the RDFS entailment is ... Semantics W3C Recommendation." ;
  rdfs:isDefinedBy <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/#rdfs_entailment> ;
  rdfs:seeAlso <http://www.w3.org/TR/2004/REC-rdf-mt-20040210/> .
<http://www.w3.org/ns/entailment/data/RDFS.html> dc:title "Information Resource RDFS Entailment" ;
  xhv:stylesheet <http://www.w3.org/StyleSheets/TR/base> .
<http://www.ivan-herman.net/foaf#me> a foaf:Person ;
  rdfs:seeAlso <http://www.ivan-herman.net/foaf> ;
  foaf:mbox <mailto:ivan@w3.org> ;
  foaf:name "Ivan Herman" ;
  foaf:title "Semantic Web Activity Lead" ;
  foaf:workplaceHomepage <http://www.w3.org> .
```

getdata.py is very simple

```
import rdflib, sys
if not (1 < len(sys.argv) < 4):
    print 'usage: python getdata.py url [ rdfa | rdfa1.1 | microdata | html ]'
    print ' eg: python getdata.py "http://www.w3.org/ns/entailment/data/RDFS.html"'
    sys.exit(0)

url = sys.argv[1]
format = sys.argv[2] if len(sys.argv) == 3 else 'rdfa1.1'
g = rdflib.Graph()
g.parse(url, format=format)
print g.serialize(format='n3')
```

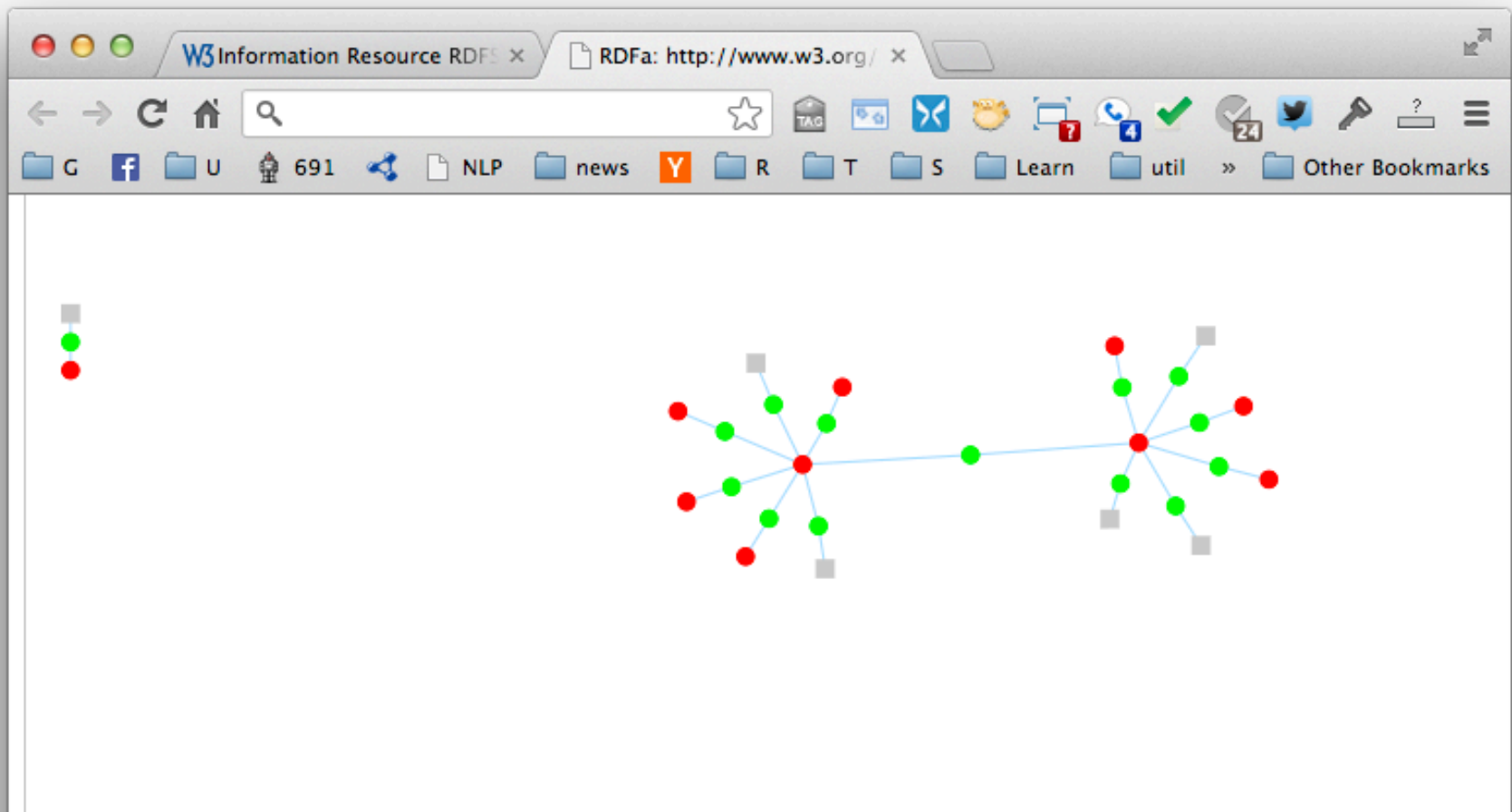
Greenturtle Chrome plugin



The screenshot shows a Chrome browser window with the address bar displaying `www.w3.org/ns/entailm...`. The toolbar contains various icons, including a green turtle icon (the Greenturtle plugin) which is highlighted by a red arrow. Below the toolbar, the page content includes the W3C Semantic Web logo, the text "Unique identifier for *RDFS Entailment*.", and a paragraph explaining the URI `"http://www.w3.org/ns/entailment/RDFS"` as part of the [specification for the RDFS entailment](#) within the [RDF Semantics](#) W3C Recommendation. Further information is directed to [the RDF Concepts and Abstract Syntax Recommendation](#). A footer line attributes the content to [Ivan Herman](#), ivan@w3.org, [W3C](#), Semantic Web Activity Lead, dated May 3rd, 2010.

<https://code.google.com/p/green-turtle/>

Greenturtle Chrome plugin



Subject	Predicate
<code><http://www.w3.org/ns/entailment/data/RDFS.html></code>	<code><http://purl.org/dc/terms/title></code>
<code><http://www.w3.org/ns/entailment/RDFS></code>	<code><http://www.w3.org/1999/02/22-rdf-syntax-ns#type></code>
<code><http://www.w3.org/ns/entailment/RDFS></code>	<code><http://purl.org/dc/terms/description></code>
<code><http://www.w3.org/ns/entailment/RDFS></code>	<code><http://www.w3.org/2000/01/rdf-schema#comment></code>

Conclusions

- Web developers want content providers to add structured data to HTML pages
- Content providers are incentivised to do so because their content will be better understood, ranked higher, more useful, etc.
- RDFa is the most powerful and flexible of the knowledge mark up standards understood by search engines
- RDFa is also an alternative serialization of full RDF