Linked Enterprise Data via REST and Link Relations?

W3C Workshop on Linked Enterprise Data Patterns

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Who am I?

I believe in the Semantic Web…

… but I'm a pragmatist.

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Overview

- Examples of data services (at EMC)
  - Management products expose information about data center entities – hosts, switches, storage devices, etc.
  - Content management systems expose documents as well as metadata used to manage those – folders, policies, ACLs, etc.
  - …
- We've had some success championing RESTful web services
  - The environment is highly distributed and potentially very large
    - that is, CLOUD
  - Resource oriented
  - Product groups are all building RESTful interfaces

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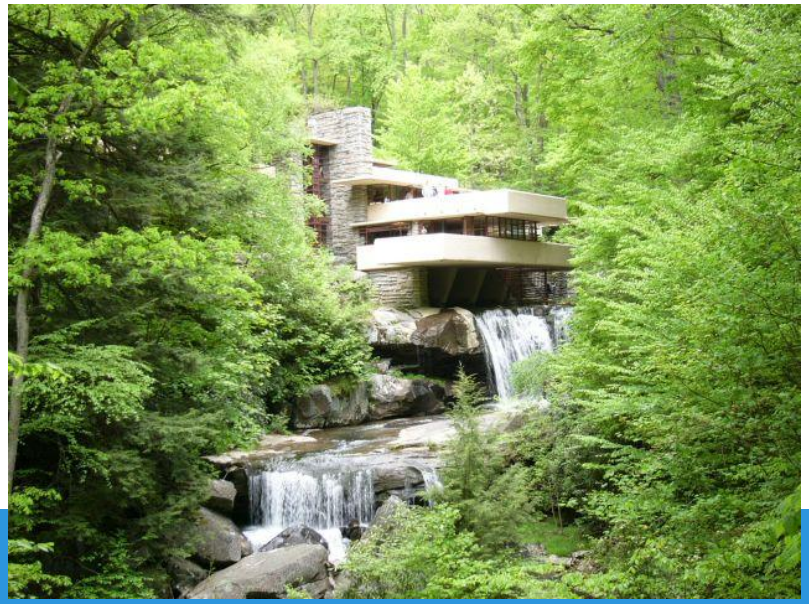
REST Principles

- REST is an architectural style that depends upon:
- Identification and addressability of resources
  - All interesting bits of information are identified with URIs and are usually accessed via URL
- The uniform interface
  - Interaction with resources through a standardized set of operations, with well understood semantics
- Manipulation of resources through representations
  - Media types
- Hypermedia as the engine of application state
  - Hyperlink your resources



How Well Do Existing REST Frameworks Do?

Feature	Java FWs (alone)	Comments
Named Resources	●	URI template support - @RequestMapping("/patients/{pid}")
Define Uniform Interface	●	@RequestMapping (method = RequestMethod.GET) *(+ PUT, POST, DELETE, PATCH, etc.)*
Handle media types	◓	Frameworks do allow bad practices; most don't fully support features like media type parameters
Link to other resources	○	nothing
Implementation		Generally happens with a bunch of java code.

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Atom Syndication Format – Primary Constructs

- Feed
  - A collection of entries
  - Includes feed metadata
  - Defines values that may be inherited by contained entries
  - Mandatory elements: ID (an IRI), Title, Updated (date) plus
    - One or more author elements if one of the contained entries does not include author
- Entry
  - Representation of a single web resource
    - Single blog post
    - Single news story
    - Single CMDB entry
    - Single document
    - …
  - Can stand alone
  - May inherit or override values from the containing feed
  - Mandatory elements: ID (an IRI), Title, Updated (date) plus
    - One or more author elements if the containing feed does not include author
    - Either ‹content› or a ‹link› to the content
    - (possibly) a ‹summary› element

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Atom Syndication Format - Elements

- All elements are defined in the atom namespace:

  http://www.w3.org/2005/Atom

- Container elements
  - atom:feed
  - atom:entry
  - atom:content
- Metadata elements
  - atom:author (person)
  - atom:category
  - atom:contributor (person)
  - atom:generator
  - atom:icon

- Metadata Elements (cont)
  - atom:id
  - atom:link
  - atom:logo
  - atom:published (date)
  - atom:rights
  - atom:source
  - atom:subtitle
  - atom:summary
  - atom:title
  - atom:updated (date)
- Person elements
  - atom:name
  - atom:uri
  - atom:email

Atom …

… looks a lot like linked data to me.

```
<atom:entry xmlns:atom="http://www.w3.org/2005/Atom"
                    xmlns:exp="http://www.example.com/schemas/expense">
    <atom:title>My Expense Report</atom:title>
    <atom:updated>2011-04-26T18:30:02Z</atom:updated>
    <atom:author>
        <atom:name>Cornelia Davis</atom:name>
    </atom:author>
    <atom:id>myidscheme:12345</atom:id>
    <atom:summary>Expenses from WWW conference</atom:summary>
    <atom:link rel="self"
         href="http://www.example.com/documents/expensereports/corneliadavis/12"/>
    <atom:link rel="up"
         href="http://www.example.com/documents/expensereports/corneliadavis"/>
    <atom:link rel="http://www.example.com/relations/receipts"
         href="http://www.example.com/documents/receipts/collection4752"/>
    <atom:content href="http://www.example.com/docs/corneliadavis12.pdf"/>
    <exp:status>Approved</exp:status>
</atom:entry>
```

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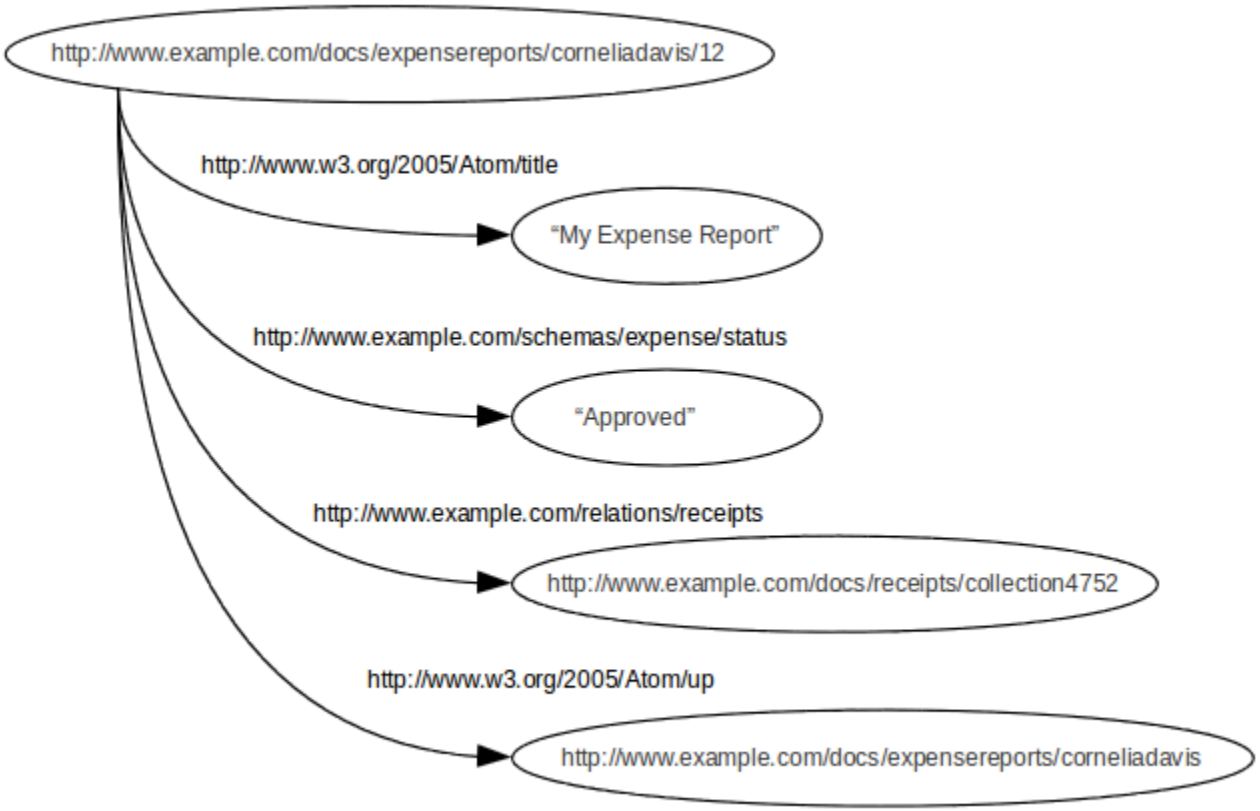
Still looking like triples



My Musings

- Pitching the Semantic Web meets with heavy resistance
- Can we leverage the success we've had with RESTful services as a back door for the semantic web?
- Are there tools that allow Atom to participate in the linked data ecosystem?
- Are there enough "standardized" ontologies to allow entrance without paying that tax?

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THANK YOU