Semantic Sitemaps

R. Cyganiak, H. Stenzhorn, R. Delbru, S. Decker, G. Tummarello
DERI Galway

A new Web (of Data)

- Old: documents for Web browsers
- New: structured data for mashups and application integration
- Key technology: RDF

Observation: Costs are shifting

- Access to RDF data was hard (DMOZ, MusicBrainz)
- Today: SPARQL protocol, Linked Data, Tabulator, …
- Today: More data (FOAF, Linking Open Data)
- Problem is no longer access but discovery

Towards a map of the new Web

- Swoogle
- SWSE
- Falcon-S
- Watson
- Sindice

3 challenges

1. Different access methods

Linked
Data

RDF
dumps

SPARQL
endpoints

- GET to http://dbpedia.org/resource/Tenerife
- Dumps from http://downloads.dbpedia.org/
- SPARQL to http://dbpedia.org/sparql
- Same data everywhere

2. Crawl performance

- Toy servers, aggressive crawlers
- 1 request per second = 2.6M per month
- Geonames has 6M+ entities
- *If a dump is available, how would a crawler know?*

3. Provenance

- Is built-in feature of the Web (DNS)
- URI ownership, authoritative information
- Delegation of URI space not visisble

Proposed solution

Semantic Sitemaps

- Publishers tell us where they have RDF data
- Based on Google's Sitemap protocol
- Put a simple XML file on your server

Google’s Sitemap protocol

http://example.com/sitemap.xml

```
<urlset>
   <url>
      <loc>http://www.example.com/</loc>
      <lastmod>2008-01-01</lastmod>
      <changefreq>monthly</changefreq>
   </url>
   ... more ...
</urlset>
```

Semantic Sitemaps

```
<urlset>
   ...
   <sc:dataset>









   </sc:dataset>
</urlset>
```

Semantic Sitemaps

```
<urlset>
   ...
   <sc:dataset>
      <sc:linkedDataPrefix>
            http://dbpedia.org/resource/
      </sc:linkedDataPrefix>




   </sc:dataset>
</urlset>
```

Semantic Sitemaps

```
<urlset>
   ...
   <sc:dataset>
      <sc:linkedDataPrefix>
            http://dbpedia.org/resource/
      </sc:linkedDataPrefix>
      <sc:dataDumpLocation>
            http://downloads.dbpedia.org/dump.nt.gz
      </sc:dataDumpLocation>




   </sc:dataset>
</urlset>
```

Semantic Sitemaps

```
<urlset>
   ...
   <sc:dataset>
      <sc:linkedDataPrefix>
            http://dbpedia.org/resource/
      </sc:linkedDataPrefix>
      <sc:dataDumpLocation>
            http://downloads.dbpedia.org/dump.nt.gz
      </sc:dataDumpLocation>
      <sc:sparqlEndpointLocation>
            http://dbpedia.org/sparql
      </sc:sparqlEndpointLocation>

   </sc:dataset>
</urlset>
```

Semantic Sitemaps

```
<urlset>
   ...
   <sc:dataset>
      <sc:linkedDataPrefix>
            http://dbpedia.org/resource/
      </sc:linkedDataPrefix>
      <sc:dataDumpLocation>
            http://downloads.dbpedia.org/dump.nt.gz
      </sc:dataDumpLocation>
      <sc:sparqlEndpointLocation>
            http://dbpedia.org/sparql
      </sc:sparqlEndpointLocation>
      <changefreq>monthly</changefreq>
   </sc:dataset>
</urlset>
```

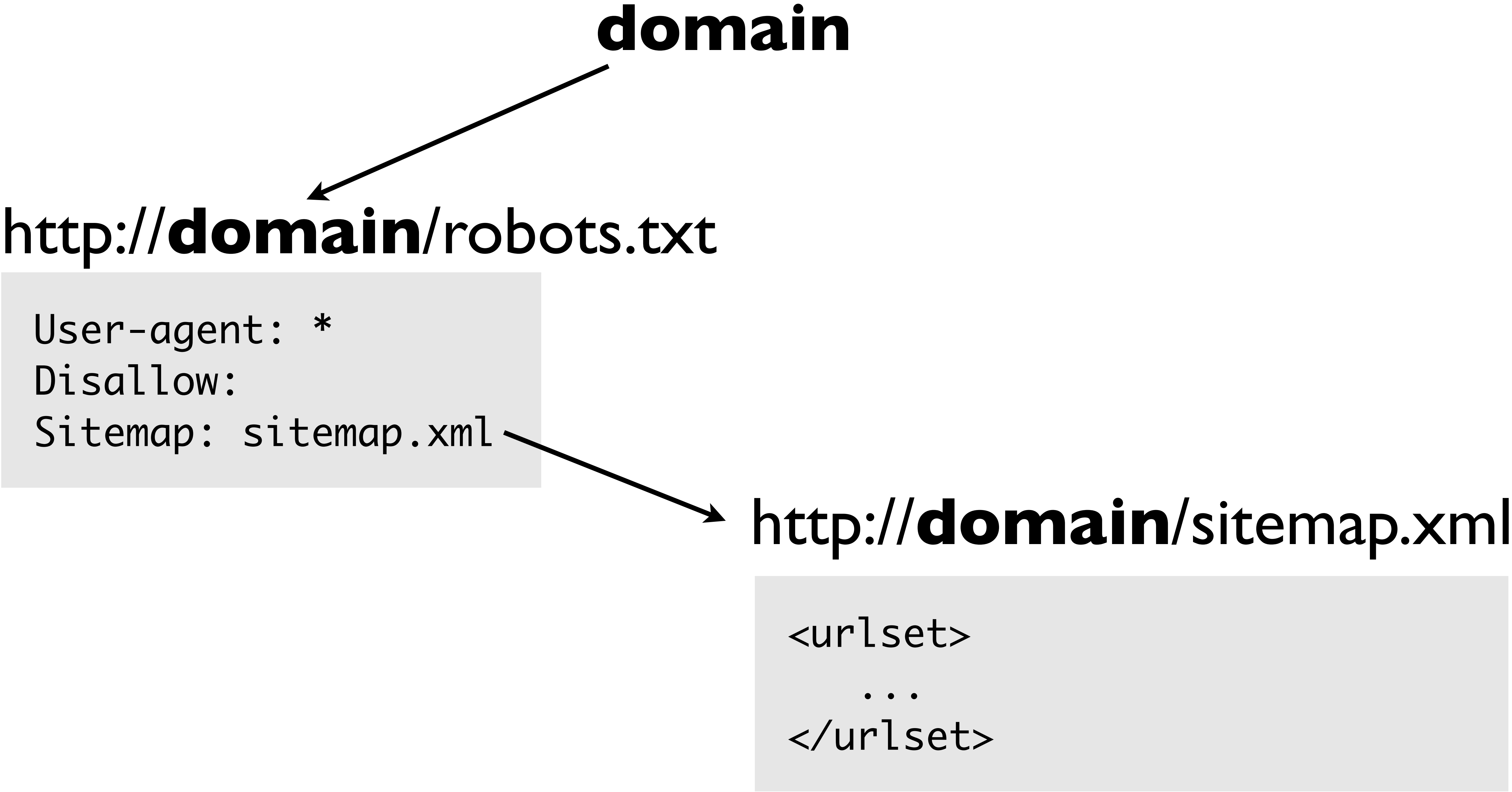
More elements

- sc:datasetLabel: Name for the dataset
- sc:datasetURI: Hook for additional metadata
- sc:authority: Hook for identifying the publisher
- sc:sampleURI: Some representative URIs from the DS
- …

Why XML?

- Conservative webmasters
- Simple

Sitemap discovery



domain

http://**domain**/robots.txt

```
User-agent: *
Disallow:
Sitemap: sitemap.xml
```

http://**domain**/sitemap.xml

```
<urlset>
   ...
</urlset>
```

1. Different access methods

- Clients can choose between
  - `sc:linkedDataPrefix`
  - `sc:dataDumpLocation`
  - `sc:sparqlEndpointLocation`

2. Crawl performance

- Crawlers can discover and use RDF dump
- Experiment: Downloading and slicing Uniprot takes ~25h and can be parallelized
- Crawling Uniprot would take ~5 months
- Bottleneck moves from retrieval to indexing

3. Provenance

- Delegating and joining URI spaces with sc:subSitemap and sc:parentSitemap
- Describing the publisher with sc:authority
- URI space can be authoritatively served from a dump or SPARQL endpoint

Community and adoption

- Most large LOD datasets have a sitemap
- Supported by Sindice and SWSE
- Publishers are receptive
- They want a validator
- public-lod@w3.org mailing list

Next steps

- Updated draft
- Sitemap creator + validator
- Work on content descriptions (VOID)

Semantic Sitemaps …

- … are a proposal for better RDF discovery
- … allow publishers to announce their data
- … allow consumers to efficiently find it
- … have hooks for describing content and authority

http://sw.deri.org/2007/07/sitemapextension/

richard@cyganiak.de