PhD Thesis
Progress and future work

Querying and optimising access to RDF datasets

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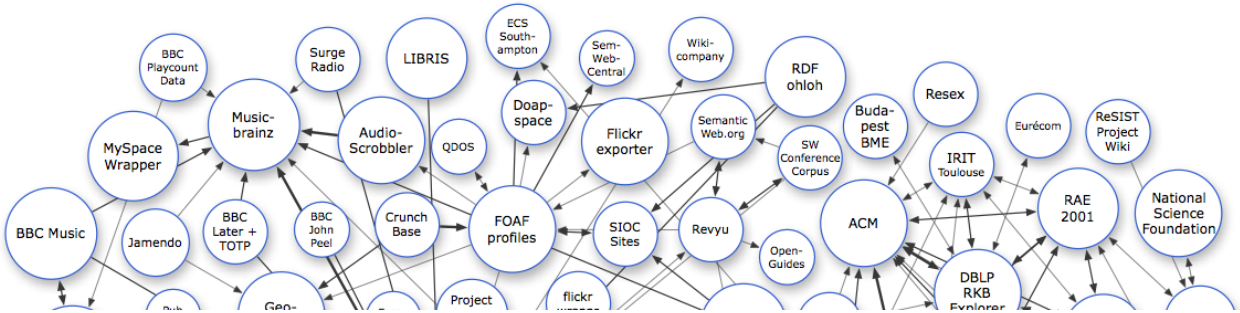
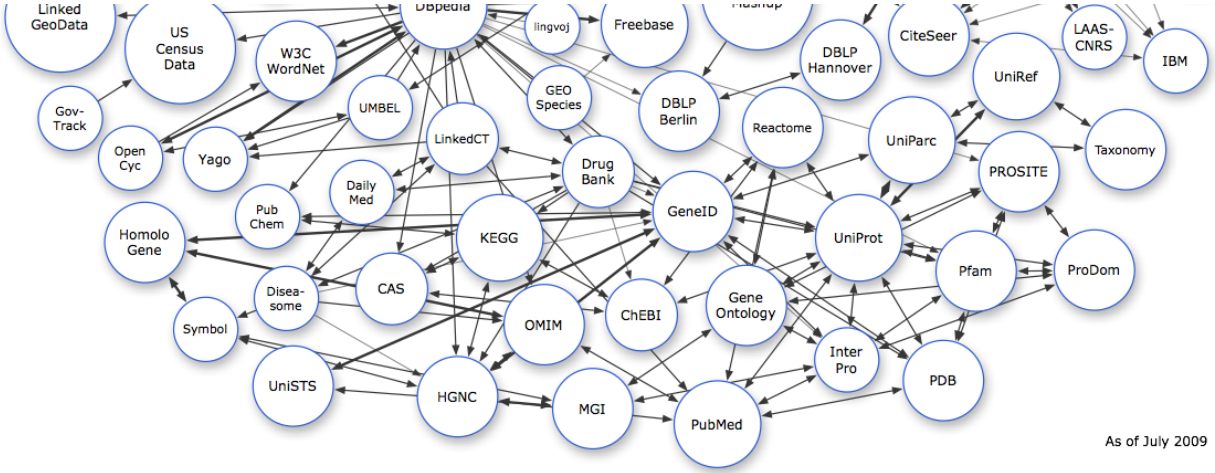
Introduction

- Everyday more RDF data is published on the Web
  - Mostly via SPARQL endpoints
  - Fc
  - Cu
  - htt
  - htt



They are not fully connected, i.e. To mash up the data it is necessary to query each of the RDF datasets



Introduction

- Currently there are only a few approaches to federate SPARQL queries
  - DARQ (Cyganiak 2006)
  - SemWIQ (Langegger, iiWAS2008)
  - Networked Graphs (Staab WWW2008)
  - Executing SPARQL Queries over the Web of Linked Data (Hartig, Bizer, Freytag, ISWC09)
- Problems from the previous approaches
  - They implement a basic system for optimising SPARQL queries
  - They do not take into account neither blank nodes nor complexity
  - They do not implement many optimisation methods

Introduction

- Can RDB2RDF Tools Feasibly Expose Large Science Archives for Data Integration?, ESWC 2009
  - No, among other reasons there is no research in SPARQL Query Optimisation (authors dixit)
- Need of query optimisation
  - A Flexible Architecture for Virtual Information Integration based on Semantic Web Concepts, A Langegger, PhD Thesis (beginning 2010)
  - Foundations of SPARQL Query Optimization, M Schmidt, M Meier, G Lausen (Tech. Report 2008)

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Working Hypotheses

Assumptions

- There is a large set of distributed RDF stores with a large amount of triples (billions of triples)
- RDF data is linked, or has links between them
- A SPARQL query can be translated into a SQL query, without losing expressivity

Restriction

- Users have a minimal knowledge of the vocabulary used in those RDF datasets

Hypotheses to test

- It is possible to use existing SQL distributed query processing techniques to process distributed SPARQL queries

Objectives

- Design, implement and evaluate a Distributed Query Processor to federate SPARQL queries
- Create new SPARQL optimisation techniques
- Validate how existing SQL optimisation techniques perform in a distributed SPARQL query environment

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PhD Progress

- First Year
  - Read, read, read
    - About Grid computing
    - About Description Logics
    - About Computational Complexity
  - Attendance to ISGC 2008 as student
  - Attendance to OGF 25
    - Which changed a little bit my research topic
  - Paper accepted in Web Semantics workshop in conjunction with DEXA2009: Robust service-based semantic querying to distributed heterogeneous databases, Buil-Aranda C, Corcho O, Krause A
  - Suficiencia investigadora (beginning of second year)

PhD Progress

- Second year
  - Extended an existing SQL Distributed Query Processing system
  - SPARQL-DQP implementation
    - Extends a well know DQP system: OGSA-DQP
  - Research visit: EPCC and NeSC in Edinburgh (July to end September)
  - Submitted paper to ER2010 conferences, waiting for an answer (an others)
  - Many contacts with international institutions, to collaborate in some way
    - Carleton Univ. (bio2rdf, Michel Dumontier, thanks to Alex), EPPC & NeSC (Uni Edinburgh), PUC (Chile, M Arenas and C Gutierrez), UCL (London), Uni Vienna, AIST (Japan)
  - Collaboration with DAIS-WG

PhD Progress

- Third year (since April)
  - Improvement of the SPARQL-DQP software
  - Research visit to Universidad Católica de Chile (Claudio Gutierrez and Marcelo Arenas)
    - Goals: Merge both theoretical and practical approaches to SPARQL query processing
    - Treat blank nodes problem?
  - Paper to ESWC: outcome from the research visit
  - Paper to ISWC? Journal of Web Semantics?
  - Write the PhD thesis
  - If there is time research visit to?
    - Vienna (with A Langegger)?
    - U. South California (with JL Ambite)?

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