

„Confined“ Linked Data for physical-cyber-social-data?

Axel Polleres

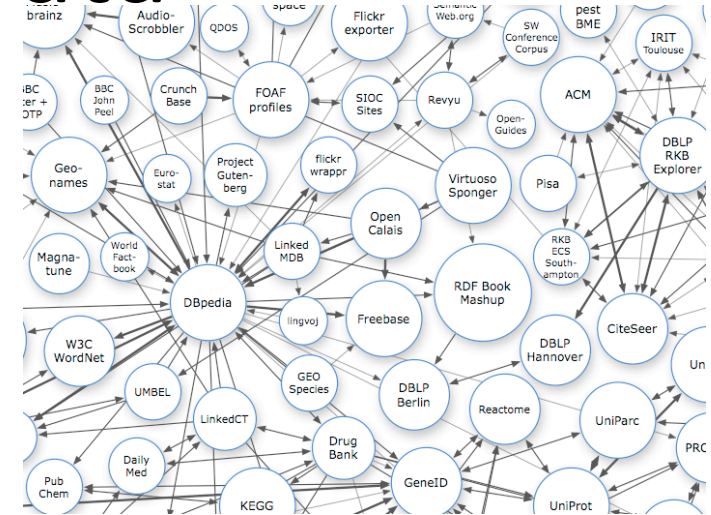
Wirtschaftsuniversität Wien (WU)

So I talk about what I don't know...

What is physical-cyber-social-data?

- Linked Open Data?
- Social Data?
- Physical data (sensing data)?

Linked Open Data








- High hopes!
 - pushed by W3C as **the** standard format for sharing and re-using **public** data:
W3C GLD, W3C LDP WGs
 - strong standards to query and integrate that data
(RDF, SPARQL, OWL)

→ powered by Open Data Movement

Recent efforts to get dynamics into the equation:

→ W3C RSP WG: RDF Stream Processing

Social Data

- Some exporters into RDF, but
- ... is still in silos     
- ... BTW, the idea of „Open Social“ seems to be partially on the decline...
 - FOAF did not really pick up as a decentral way to define social networks
 - OpenId providers like MyOpenID closing their services

myOpenID™

MYOPENID WILL BE TURNED OFF ON FEBRUARY 1, 2014

MYOPENID WILL BE TURNED OFF ON FEBRUARY 1, 2014

We have made the decision to end of life myOpenID. We will keep the service up and running until February 1, 2014.

Physical Data

- Personal sensing Data
 - On our mobiles: in silos, cf. previous slide
 - More silos: e.g. SmartMeter data, Car Data, etc.



... in fact all this data is implicitly **linked**...

- by **user identities**,
- by **location**,
- by **temporal co-occurrence**.

.. But

- neither of these contextual parts of information is natively a part of RDF,
 - **Plus:** Little incentive for the current data owners to **share** that data and/or provide open interfaces
-
- → We need to define the use cases for open interchange!

Challenges, as I see them

- Use Cases:
 - Aggregating this data has huge potential, but:
 - Who (apart from NSA) can benefit from integrating this data?
 - Energy, Sustainability use cases: monitor localized energy consumption, personal, per building, etc.
 - Personal healthcare
- How to bring data owners (us) back into the equation?
- How can **standards** support that?
 - Standards for sharing and integrating – done: RDF
 - Standards for querying data –SPARQL – done?
 - SPARQL needs to be **extended** to cope with highly dynamic data **RSP?**
 - SPARQL needs to be **restricted** to scale to dynamic use cases
 - Standard(s +) mechanisms for tracking data provenance – done?
 - **PROV** is a good start, but is it too academic? I.e. is it running into the same issues as FOAF?
 - Standard(s +) mechanisms for protecting data
 - Various extensions for adding Access rights to SPARQL, but I haven't yet seen any maturing to a standard
 - Encryption
 - Standard(s +) mechanisms for trading data
 - Advertising and declaring **pricing models**, automated charging
 - Ability to **revoke** access rights

So, do we need...

Linked Dynamic ~~„Closed“~~ Data? „Confined“

- Linked Data & Mechanisms to deal with Dynamicity & Evolution.
- Linked Data & Provenance, Trust, Privacy & Policies.
- Linked Data & more (and less) than OWL and SPARQL.
- Linked Data & trading/pricing models

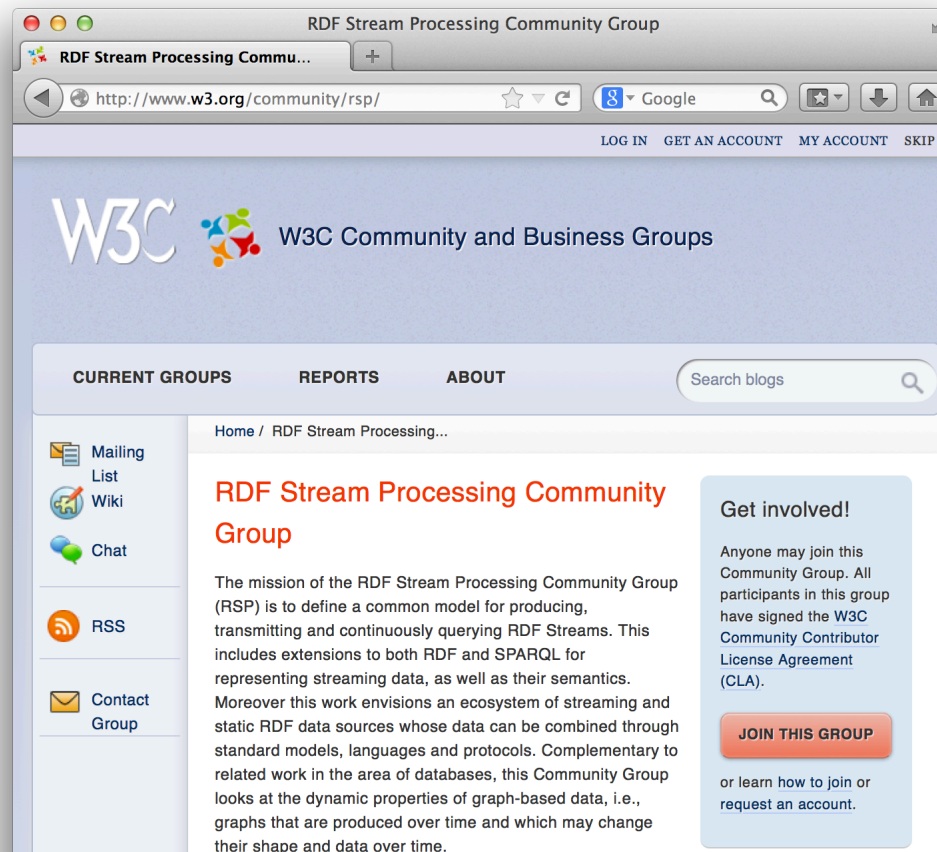
Some starting points

- Not exhaustive, of course...

Some Starting Points 1/4

- Linked Data & Mechanisms to deal with Dynamicity & Evolution.

- W3C RSP

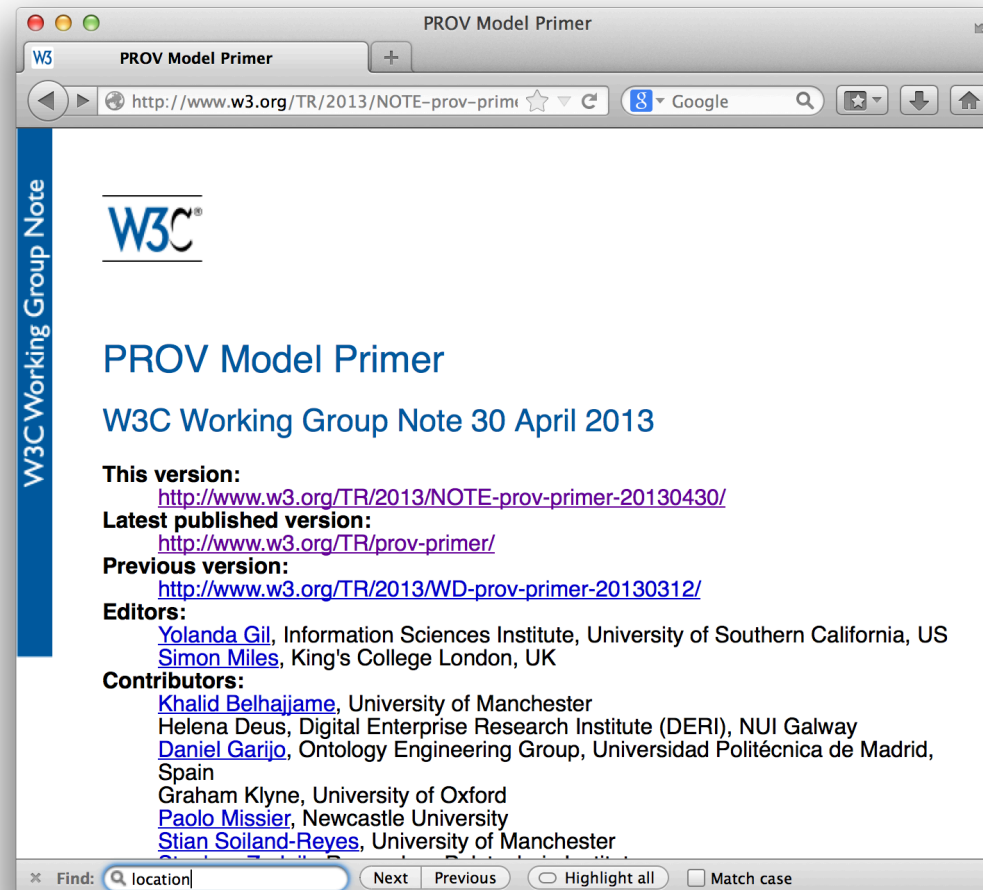


The screenshot shows a web browser window displaying the W3C RDF Stream Processing Community Group page. The browser's address bar shows the URL <http://www.w3.org/community/rsp/>. The page header includes the W3C logo and the text "W3C Community and Business Groups". Below the header, there are navigation links for "CURRENT GROUPS", "REPORTS", and "ABOUT", along with a search bar labeled "Search blogs". The main content area features the title "RDF Stream Processing Community Group" in red. The mission statement reads: "The mission of the RDF Stream Processing Community Group (RSP) is to define a common model for producing, transmitting and continuously querying RDF Streams. This includes extensions to both RDF and SPARQL for representing streaming data, as well as their semantics. Moreover this work envisions an ecosystem of streaming and static RDF data sources whose data can be combined through standard models, languages and protocols. Complementary to related work in the area of databases, this Community Group looks at the dynamic properties of graph-based data, i.e., graphs that are produced over time and which may change their shape and data over time." To the right of the mission statement, there is a "Get involved!" section with the text: "Anyone may join this Community Group. All participants in this group have signed the W3C Community Contributor License Agreement (CLA)." and a prominent orange "JOIN THIS GROUP" button. Below the button, it says "or learn how to join or request an account."

Some Starting Points 1/4

- Linked Data & Provenance, Trust, Privacy & Policies.

- W3C PROV:
 - + modeling prov and also temporal context
 - location?



Some Starting Points 1/4

- Linked Data & Provenance, Trust, Privacy & Policies.

- W3C RDF 1.1
 - + named graphs
 - how to use them?
 - E.g. how to attach prov/context to datastreams?

W3C Working Draft

W3C

RDF 1.1 Concepts and Abstract Syntax

W3C Last Call Working Draft 23 July 2013

This version:
<http://www.w3.org/TR/2013/WD-rdf11-concepts-20130723/>

Latest published version:
<http://www.w3.org/TR/rdf11-concepts/>

Latest editor's draft:
<https://dvcs.w3.org/hg/rdf/raw-file/default/rdf-concepts/index.html>

Previous version:
<http://www.w3.org/TR/2013/WD-rdf11-concepts-20130115/>

Latest recommendation:
<http://www.w3.org/TR/rdf-concepts>

Editors:
[Richard Cyganiak](#), [DERI](#), [NUI Galway](#)
[David Wood](#), [3 Round Stones](#)

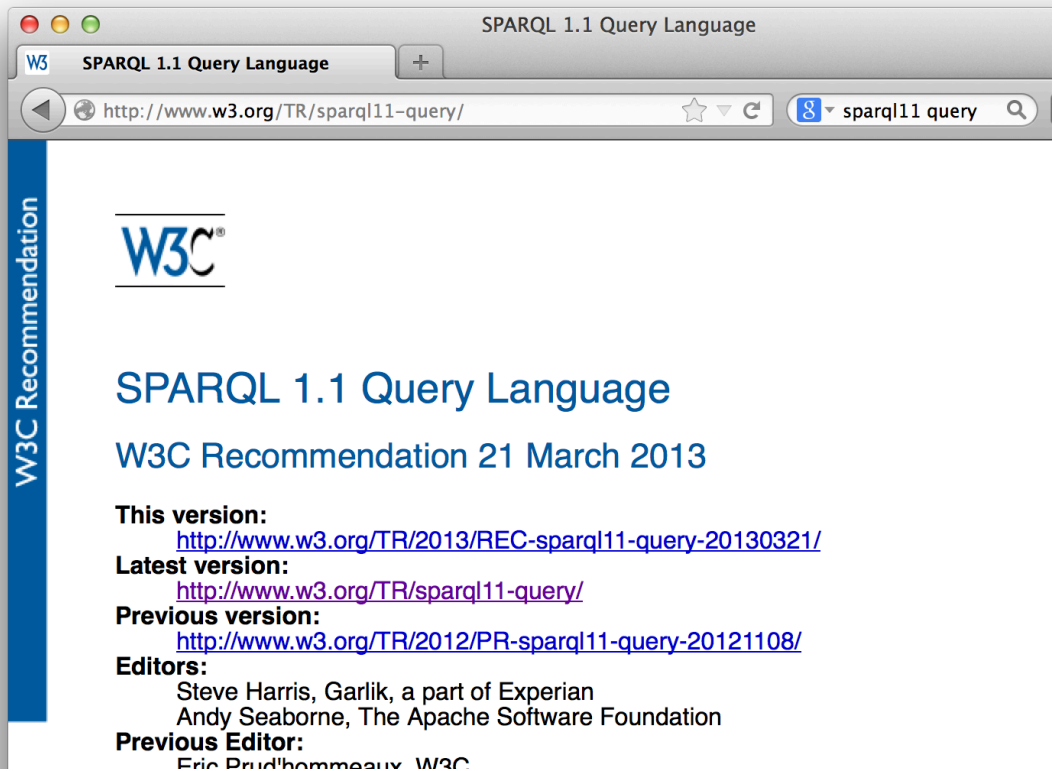
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Find: Next Previous Highlight all Match case

Some Starting Points 1/4

- Linked Data & Mechanisms to deal with Dynamicity & Evolution.
- Linked Data & Provenance, Trust, Privacy & Policies.

- W3C SPARQL 1.1
 - + querying named graphs
 - + update/dynamics
 - + federated queries
 - + service descriptions
 - Language fragments that scale to PCS use cases



The screenshot shows a web browser window with the title "SPARQL 1.1 Query Language". The address bar contains the URL "http://www.w3.org/TR/sparql11-query/". The page content includes the W3C logo, the title "SPARQL 1.1 Query Language", and the text "W3C Recommendation 21 March 2013". Below this, there are links for "This version:", "Latest version:", and "Previous version:", each followed by a URL. The "Editors:" section lists Steve Harris, Garlik, a part of Experian and Andy Seaborne, The Apache Software Foundation. The "Previous Editor:" section lists Eric Prud'hommeaux, W3C.

W3C Recommendation

W3C[®]

SPARQL 1.1 Query Language

W3C Recommendation 21 March 2013

This version:
<http://www.w3.org/TR/2013/REC-sparql11-query-20130321/>

Latest version:
<http://www.w3.org/TR/sparql11-query/>

Previous version:
<http://www.w3.org/TR/2012/PR-sparql11-query-20121108/>

Editors:
Steve Harris, Garlik, a part of Experian
Andy Seaborne, The Apache Software Foundation

Previous Editor:
Eric Prud'hommeaux, W3C

Our own attempts...

- Linked Data & Provenance, Trust, Privacy & Policies.

+ SPARQL on „annotated RDFS“

query RDF data
along with time,
provenance,
also access rights,
modeled

Web Semantics: Science, Services and Agents on the World Wide Web 11 (2012) 72–95



Contents lists available at SciVerse ScienceDirect

Web Semantics: Science, Services and Agents
on the World Wide Web

journal homepage: <http://www.elsevier.com/locate/websem>



A general framework for representing, reasoning and querying with annotated Semantic Web data

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ABSTRACT

We describe a generic framework for representing and reasoning with annotated Semantic Web data, a task becoming more important with the recent increased amount of inconsistent and non-reliable meta-data on the Web. We formalise the annotated language, the corresponding deductive system and address the query answering problem. Previous contributions on specific RDF annotation domains are encompassed by our unified reasoning formalism as we show by instantiating it on (i) temporal, (ii) fuzzy, and (iii) provenance annotations. Moreover, we provide a generic method for combining multiple annotation domains allowing to represent, e.g., temporally-annotated fuzzy RDF. Furthermore, we address the development of a query language – AnQL – that is inspired by SPARQL, including several features of

Are our technologies+standards fit for PCS?

- Linked Data & more **and less** than OWL and SPARQL.

- There is no black magic!

OWL: Yet to arrive on the Web of Data?

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ABSTRACT

Seven years on from OWL becoming a W3C recommendation and two years on from the more recent OWL 2 W3C Recommendation, OWL has still experienced only patchy uptake though certain OWL features (like owl:sameAs) are widely used. Other features of OWL are largely neglected by implementers in the Linked Data world. This may suggest that despite the easy implementations and the proposal of a new version, OWL is still a fragment for the Linked Data community. In this paper we analyse uptake of OWL on the Web of Data, (2) we propose a profile of the OWL fragment that is actually used/usable and (3) we arrive at the conclusion that this fragment is a simplified profile based on OWL RL, (3) propose a new fragment, which we call OWL LD (for Linked Data).

SPARQL Web-Querying Infrastructure: Ready for Action?

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² Digital Enterprise Research Institute, National University of Ireland, Galway
³ Fujitsu (Ireland) Limited, Swords, Co. Dublin, Ireland

Abstract. Hundreds of public SPARQL endpoints have been deployed on the Web, forming a novel decentralised infrastructure for querying billions of structured facts from a variety of sources on a plethora of topics. But is this infrastructure mature enough to support applications? For 427 public SPARQL endpoints registered on the DataHub, we conduct various experiments to test their maturity. Regarding *discoverability*, we find that only one-third of endpoints make descriptive meta-data available, making it difficult to locate or learn about their content and capabilities. Regarding *interoperability*, we find patchy support for established SPARQL features like ORDER BY as well as (understandably) for new SPARQL 1.1 features. Regarding *efficiency*, we show that the perfor-



http://www.youtube.com/watch?v=K8_lucR0I7Q

Looking beyond our noses...

- Linked Data & Provenance, Trust, Privacy & Policies
- Linked Data & trading/pricing models
- How can standards support privacy?
- Legal frameworks need to interplay with those standard?
- How can we enforce privacy policies make them accountable?

Personal Information Markets and Privacy: A New Model to Solve the Controversy

[Alexander Novotny](#)

Vienna University of Economics and Business

[Sarah Spiekermann](#)

Vienna University of Economics and Business

August 15, 2012

WI'2013, Leipzig

Abstract:

From the early days of protection laws, companies and consumers become more interconnected in digital environments. Technology and data demand for more personal insight. A vision of how information can be shared in a cycle and propose a 3-part model of rights and obligations for consumers and visible business partners. This model is based on relationships with distributed, anonymized personal information and non-identified data with technologies and legal

'I've Got Nothing to Hide' and Other Misunderstandings of Privacy

[Daniel J. Solove](#)

George Washington University Law School

[San Diego Law Review, Vol. 44, p. 745, 2007](#)
[GWU Law School Public Law Research Paper No. 289](#)

Abstract:

In this short essay, written for a symposium in the San Diego Law Review, Professor Solove examines the nothing to hide argument. When asked about government surveillance and data mining, many people respond by declaring, "I've got nothing to hide."

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- Linked Data & Provenance, Trust, Privacy & Policies.
- Linked Data & more (and less) than OWL and SPARQL.
- Linked Data & pricing models