



THE OFFICE OF  
**ENTERPRISE ARCHITECTURE**  
OFFICE OF THE CHIEF INFORMATION OFFICER

# **Clinical Quality Linked Data (CQLD)** on **health.data.gov**

**Health Data Initiative Forum Presentation/  
Demonstration**

**Margaret Pezeshki, CMS – George Thomas, HHS**  
**2011-06-09**

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  - A brief overview of Linked Data
  - And the Clinical Quality Linked Data project at CMS
- Part II – Demonstration
  - Screenshots of scripted interactions highlight features and functionality
    - On health.data.gov
  - Links to examples given
    - With some ‘sequence’ exceptions
      - But it gives an idea of what to click on and why ☺

# Part I - Presentation

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1. What is Linked Data?
2. Why is Linked Data Useful?
3. Linked Data Mechanics
4. CQLD Features
5. Vision and Mission
6. Acknowledgements
7. References

# [1] What is Linked Data?

- An evolution and maturation of the WWW
  - From the Web of Documents
    - Where this page <links to> that page
  - To the Web of Data
    - Where this datum <links to> that datum
- Providing global data identity resolution
  - Using ‘dereferenceable’ HTTP URI’s
    - Solves data disintegration root cause (local identity = info silo)
  - Making fine-grained data uniquely addressable
    - On the global network of computers!

# [1] Linked Data Principles

1. Use URI's as names for things
2. Use HTTP URI's so that people can look up those names
3. When someone looks up a URI, provide useful information, using the standards (RDF\*, SPARQL)
4. Include links to other URI's so that they can discover more things
  - Source
    - [Linked Data Design Issues](#), Tim Berners-Lee

# [1] Linked Data Standards

- Resource Description Framework (RDF)
  - A standard model for data interchange on the WWW
    - RDF data is a *graph of 'triples'*
      - Subject-Predicate-Object (SPO: 1-2-3)
      - aka node-arc-node, entity-attribute-value, datum1-link-datum2
- RDF Schema (RDFS)
  - A standard for describing RDF *Vocabularies*
    - classes of RDF resources and their relationships
- SPARQL Protocol and RDF Query Language (SPARQL)
  - A standard RDF query language and (HTTP) protocol
    - SPARQL is to RDF as SQL is to relational data

# [2] Why is Linked Data Useful?

- ***Turns the Web into a distributed database***
  - A ‘giant global graph’ of ‘data *in* the Web’
- Graphs are flexible, adaptable, agile
  - Integrate new data without app/infrastructure changes
- Makes it easy for mashup apps to find/merge data
  - Triples normalize conceptual and physical data models
    - Access, query, process and persist consistently across domains
- Lightweight, Standard API for all Open Gov Data!
  - TCP/IP (net), HTTP (app), RDF (data), SPARQL (query)

# [3] LD Mechanics: NIR <- Conneg -> IR

- HTTP Content Negotiation (conneg)
  - When you HTTP GET (aka *dereference*) a *Non-Information Resource* (NIR)
  - You receive a HTTP response code “303 See Other” that includes a “Location: URI”
  - You then HTTP GET an *Information Resource* (IR) at that location in some serialization format (media-type)
  - And you receive a document that contains data about the NIR

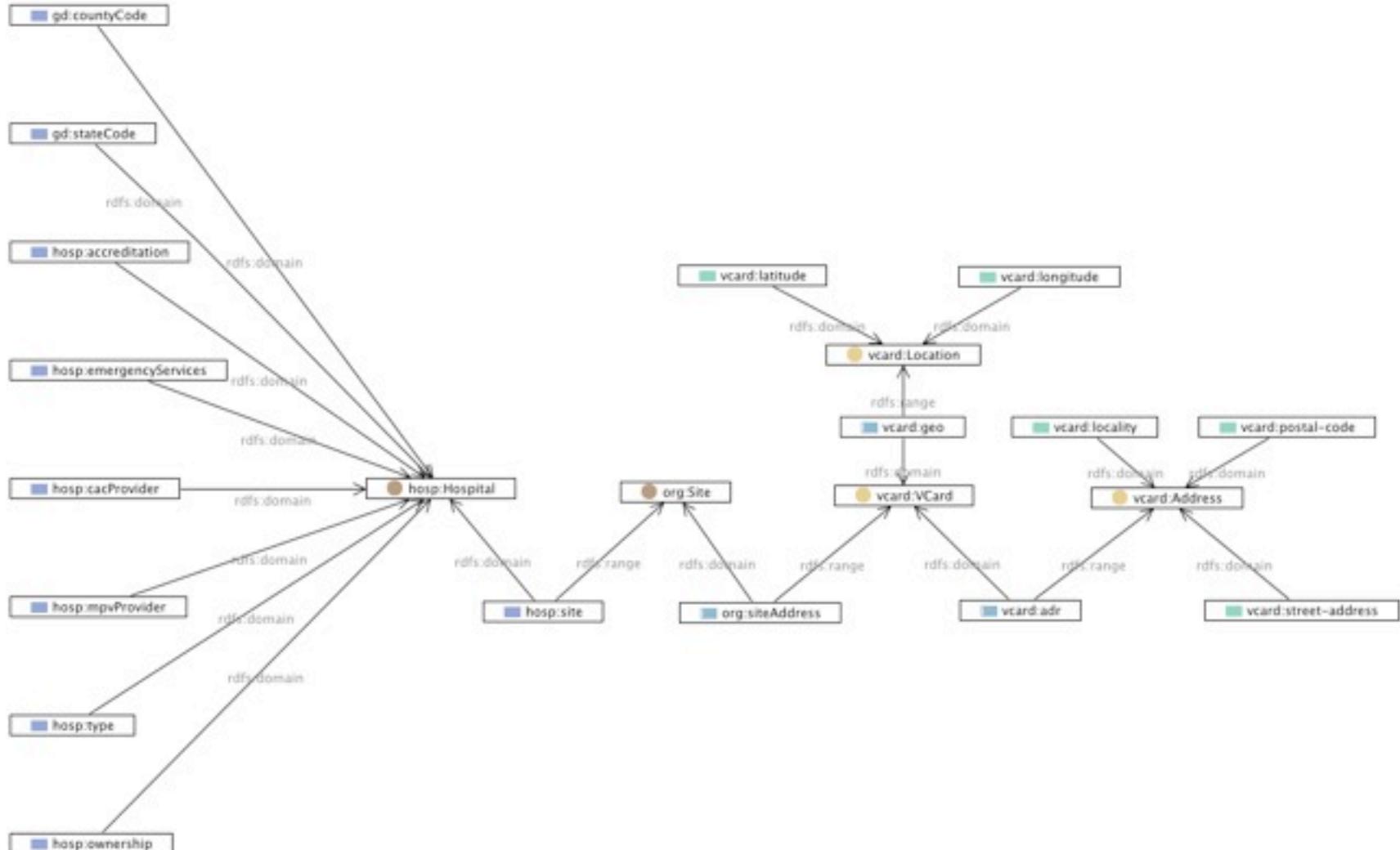
# [4] CQLD URI Scheme Conventions

- NIR's are abstract and real world things
  - The RDFS class Hospital is an abstract thing
    - <http://health.data.gov/def/hospital/Hospital>
      - Here we are **defining** a vocabulary (ontology) name **hospital** which has within it a definition for a class **Hospital**
        - » Classes use UpperCamelCase, properties use lowerCamelCase naming conventions
  - ‘Children’s Hospital of Philadelphia’ is a real world thing that is an instance of the class Hospital
    - <http://health.data.gov/id/hospital/393303>
      - Here we are specifying a globally unique **identifier** for instance **393303** of a **hospital** class of thing in the real world

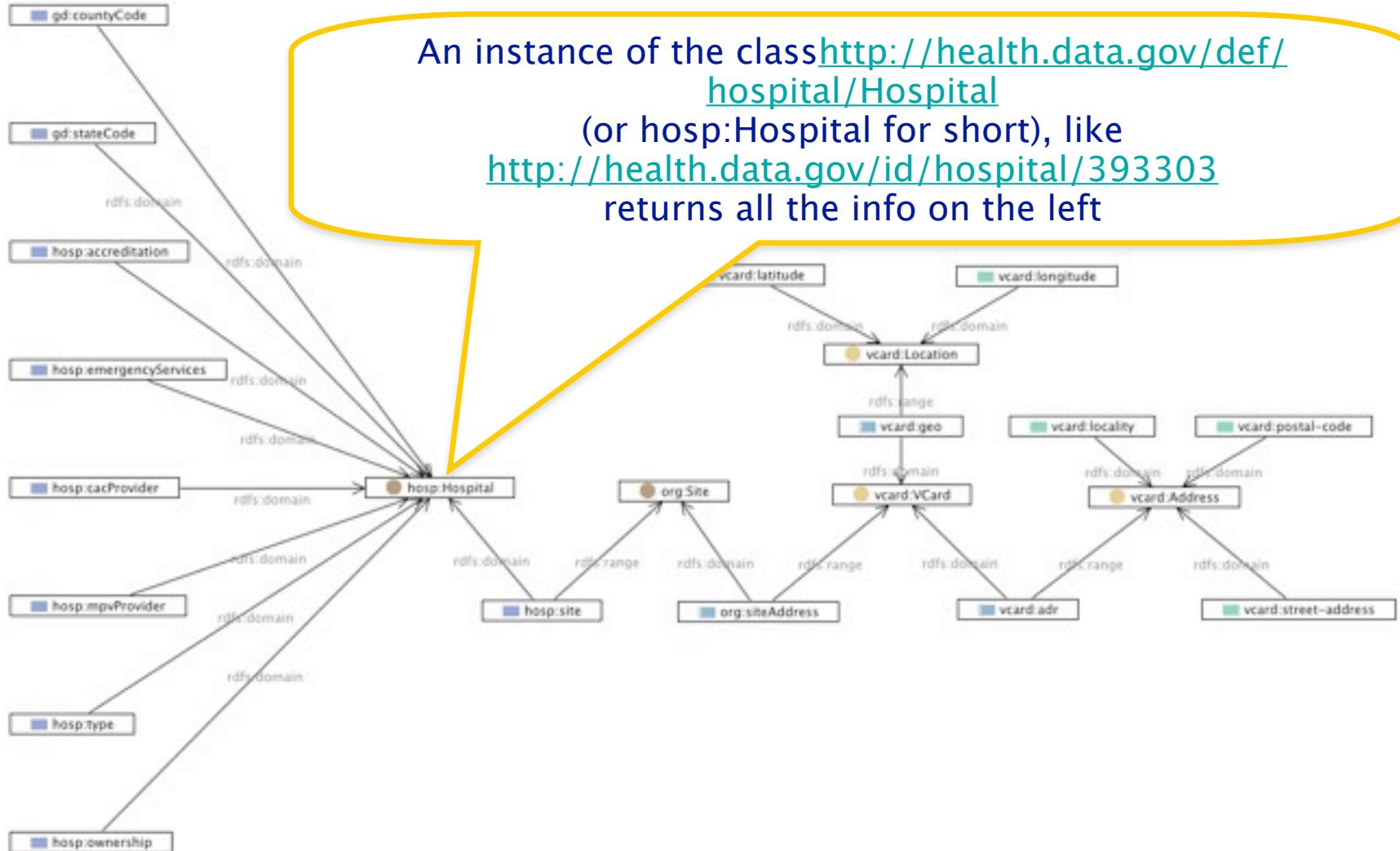
# [4] CQLD URI Scheme Conventions

- When you dereference the NIR at;
  - <http://health.data.gov/id/hospital/393303>
    - You'll get a 303 response with the location of a generic IR at;
  - <http://health.data.gov/doc/hospital/393303>
    - That will inform you of all the available representations
- If you request a specific IR representation;
  - curl –H ‘Accept: **application/json**’ http://  
health.data.gov/**id**/hospital/393303
    - You'll get a 303 response with the location of a specific IR at;
  - <http://health.data.gov/doc/hospital/393303.json>

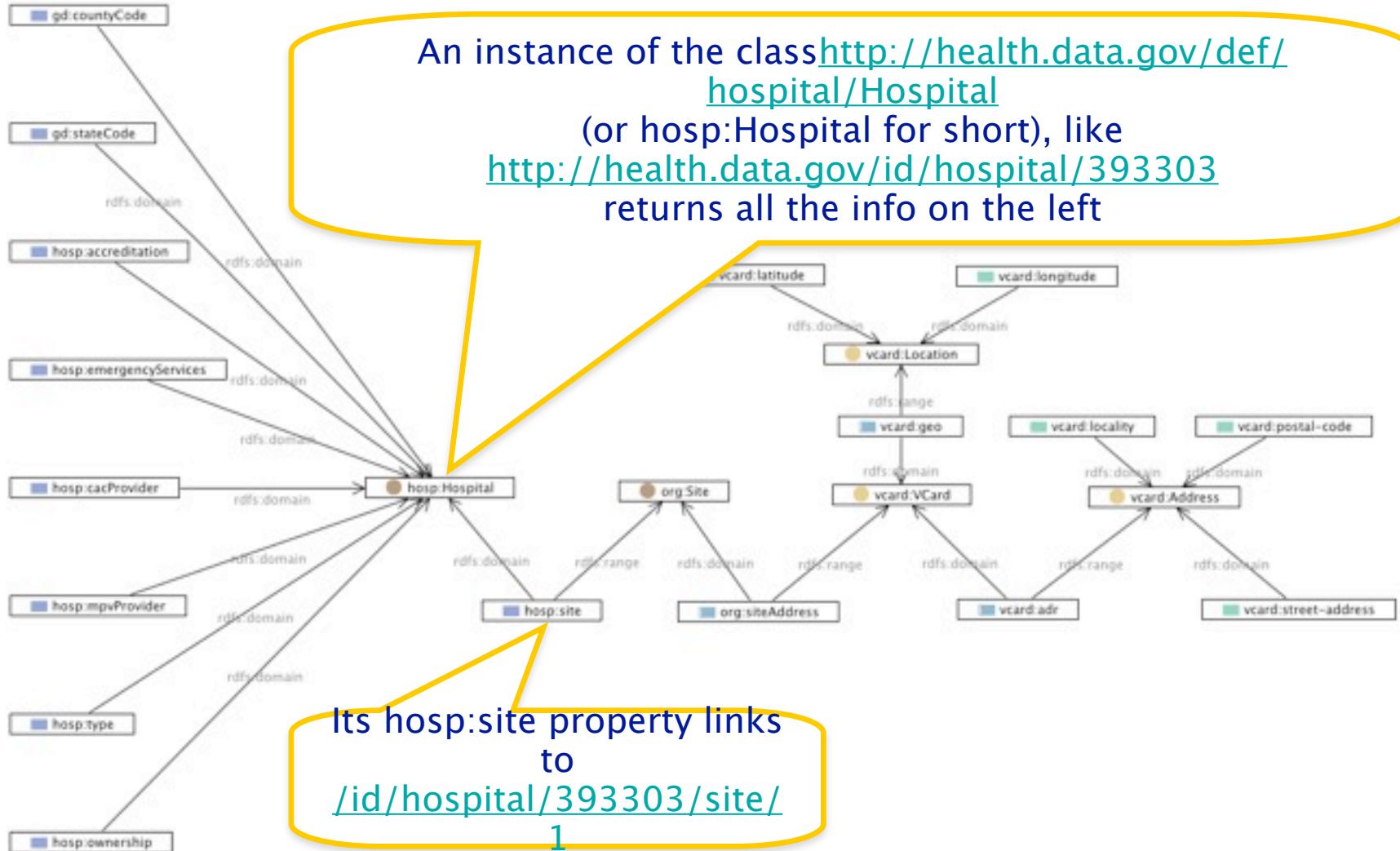
# [4] Getting all the Hospital(s) information



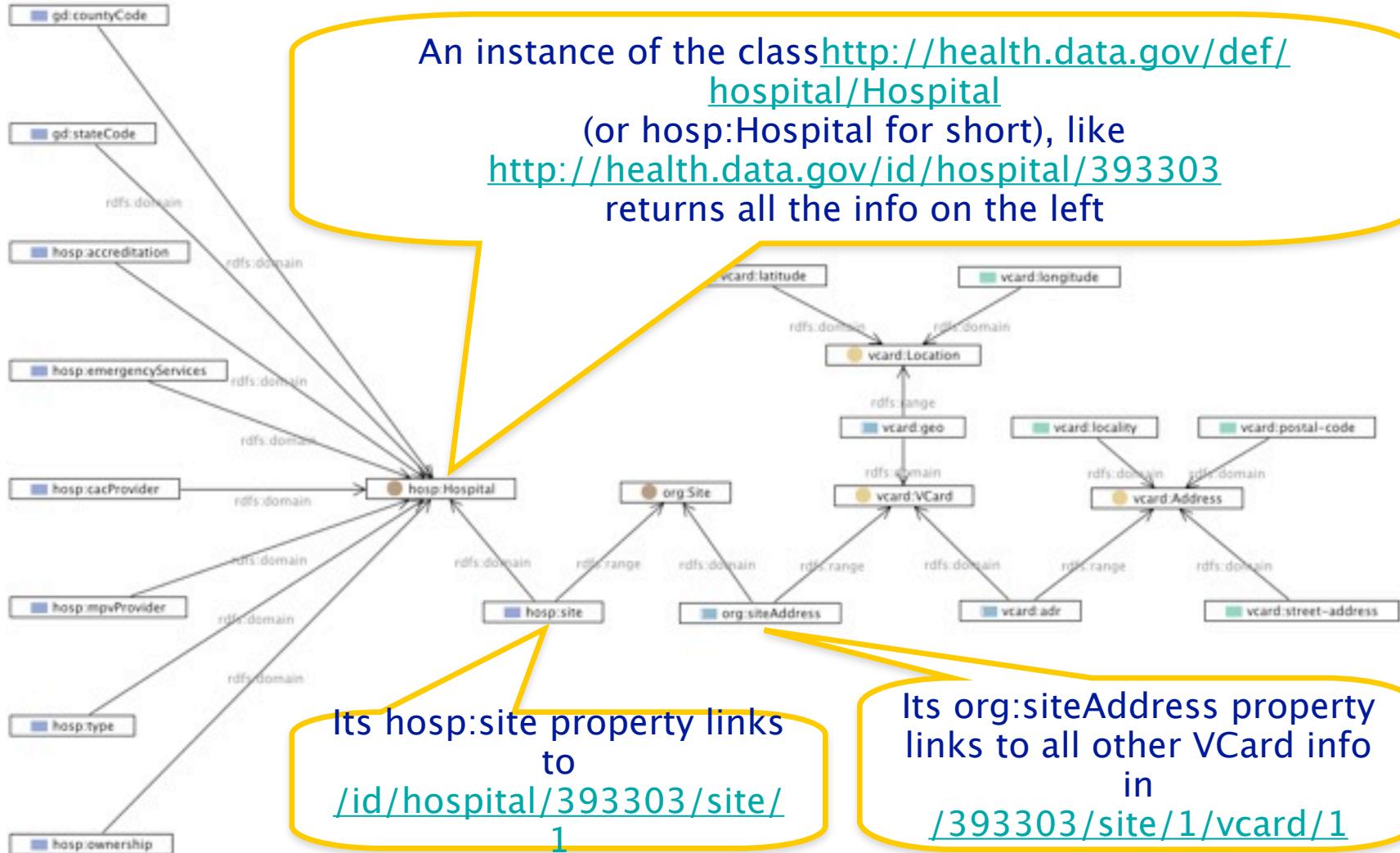
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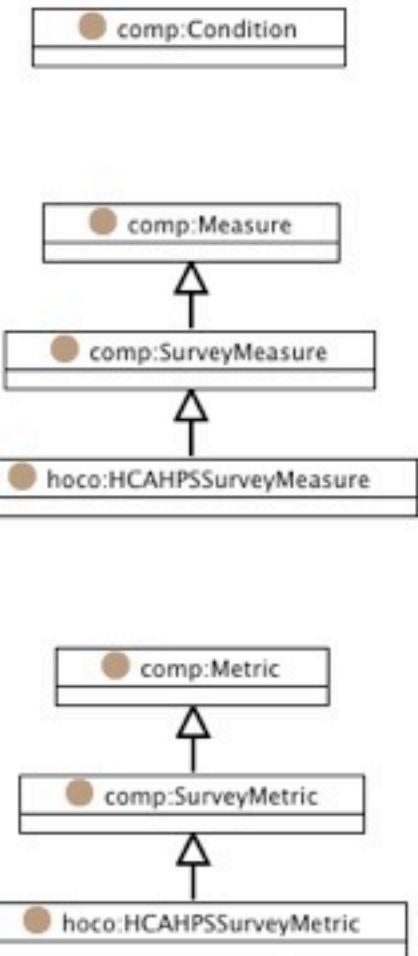


# [4] Getting all the Hospital(s) information



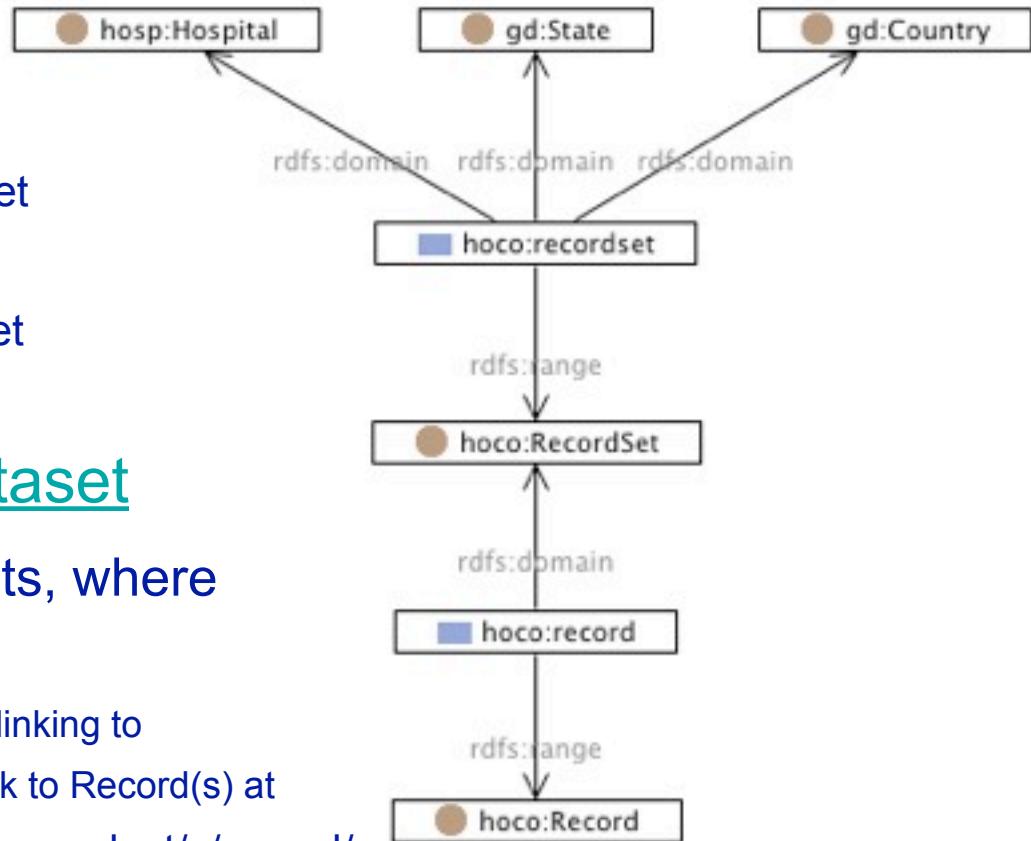
# [4] Defining Conditions, Measures, and Metrics

- A few small component vocabularies define the classes shown on the right (among others)
  - <http://health.data.gov/def/compare/Condition>
    - There are 9 unique instances of this class
    - <http://health.data.gov/id/condition/1> through [/id/condition/9](http://health.data.gov/id/condition/9)
  - <http://health.data.gov/def/compare/Measure>
    - There are 2 subclasses, one in a different vocab
    - There are 59 unique instances of these classes
    - <http://health.data.gov/id/measure/1> through [/id/measure/59](http://health.data.gov/id/measure/59)
  - <http://health.data.gov/def/compare/Metric>
    - There are 2 subclasses, one in a different vocab
    - There are 32 unique instances of these classes
    - <http://health.data.gov/id/metric/1> through [/id/metric/32](http://health.data.gov/id/metric/32)



# [4] Getting to all Hospital/State/Country Record Data

- Metadata triples (SPO)
  - ‘traversing the graph’
    - Hospital recordset RecordSet
    - State recordset RecordSet
    - Country recordset RecordSet
      - RecordSet record Record



- <http://health.data.gov/dataset>

- Returns a list of all datasets, where
  - /dataset/name/yyyy-mm-dd
    - are void:Dataset(s), each linking to
    - RecordSet(s) that each link to Record(s) at
  - /dataset/name/yyyy-mm-dd/recordset/x/record/y
- <http://health.data.gov/dataset/cacn/2011-02-25/recordset/1/record/1>

# [4] Other Features and Services

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- Faceted search and browsing
  - Discover the data models and fine grained data *interactively*
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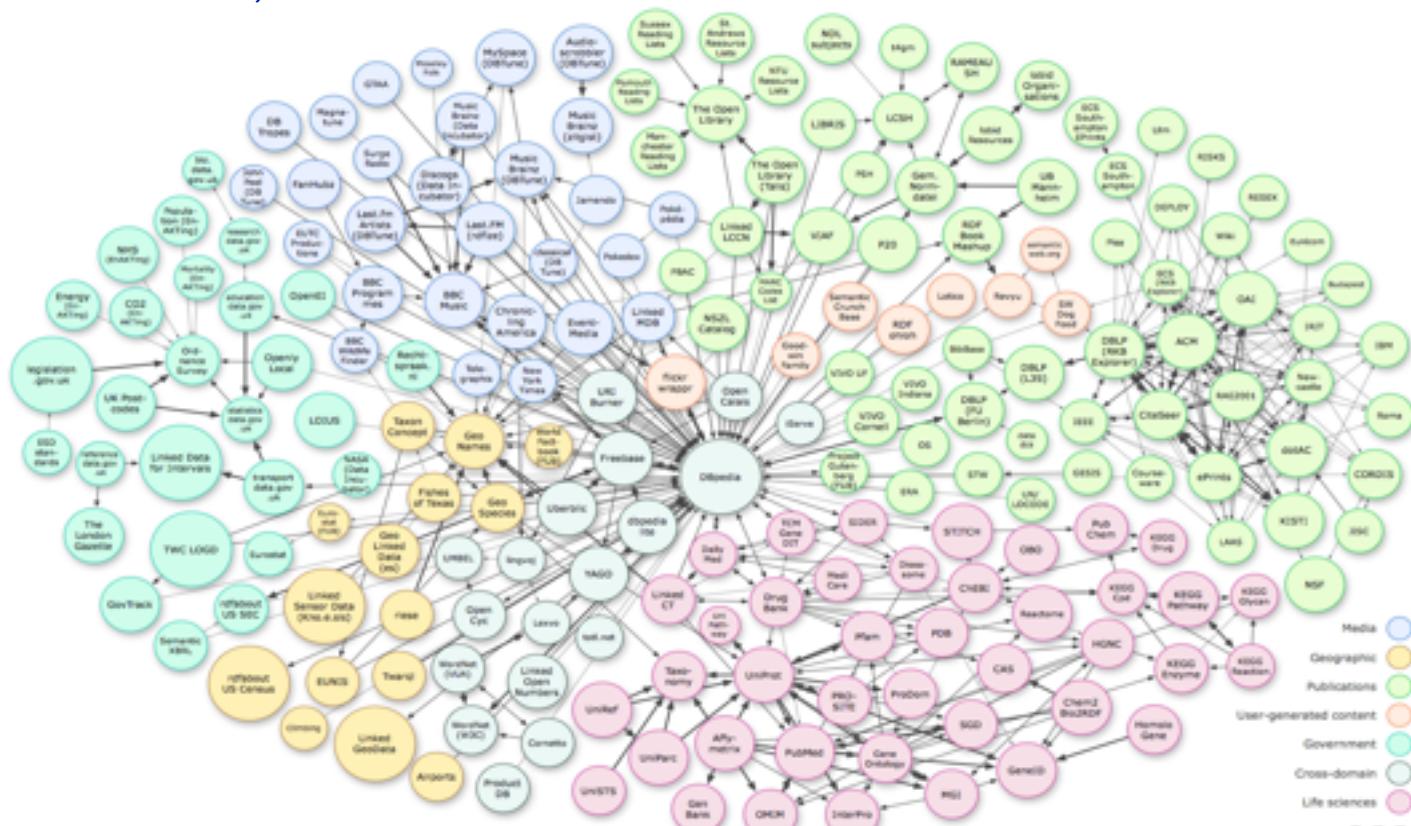
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- Feeds, other API's, and more –
- Stay for (Part II) a Demonstration!

# [5] Vision: Health Data Publisher Federation

- Imagine a Linked Health Data Cloud, that integrates;
  - Independently published data from Doctors, Hospitals, Clinics, Labs, Insurers, ...

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As of September 2010

# [5] Vision: Health Data Publisher Federation

- Imagine a Linked Health Data Cloud, that integrates;
  - Independently published data from Doctors, Hospitals, Clinics, Labs, Insurers, ...

This image is the obligatory depiction of the so-called '[Linked Data Cloud](#)' – which is just one (public) Web of Data.

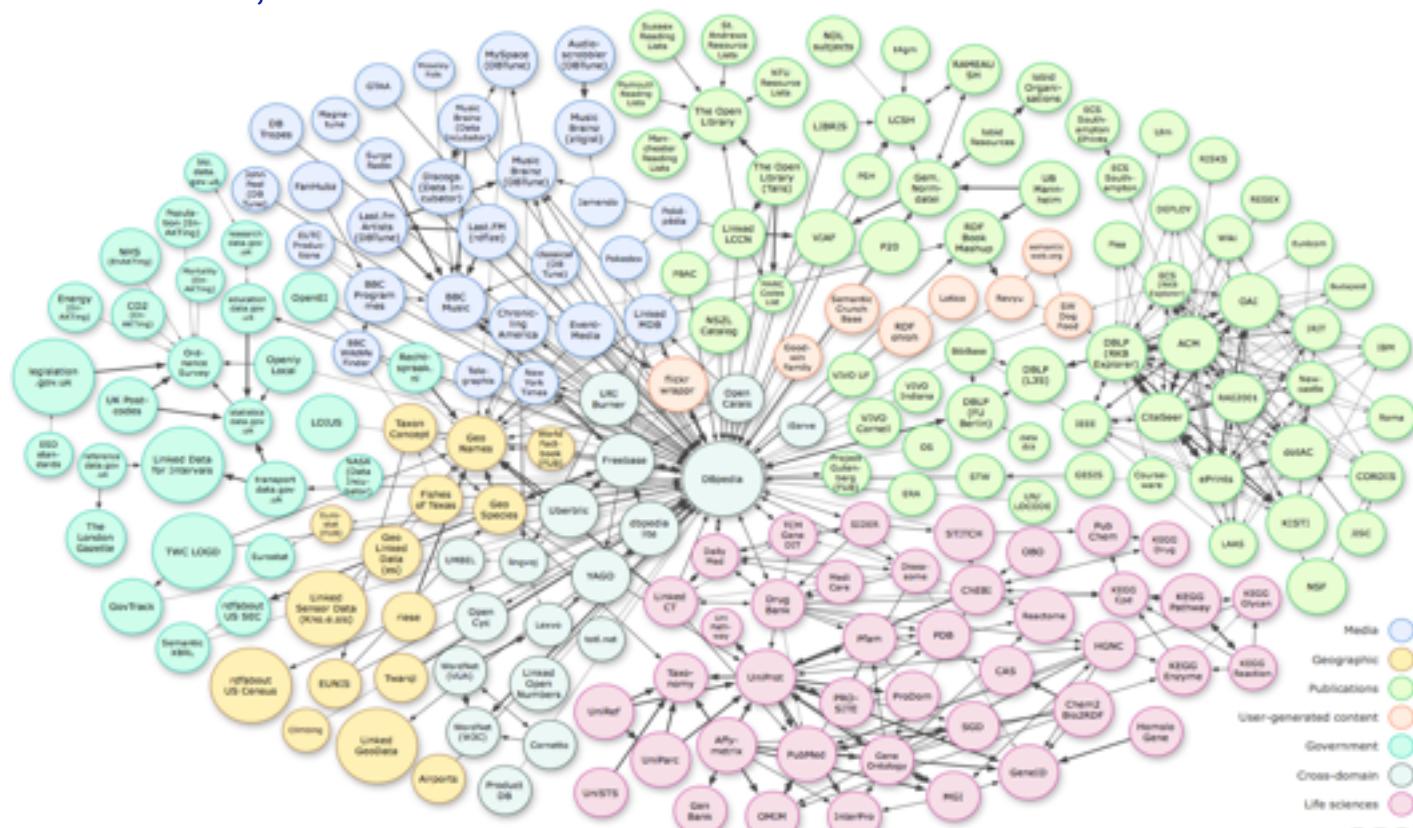
Circles are nodes (RDF subjects and objects), lines are arcs (RDF predicates). Colored nodes are different data domains (kinds of publishers).

The vision expressed here is similar technically, but would be realized as a different (public/private) Web of Data, populated by authoritative health information publishers.

As of September 2010  
domain  
Life sciences

## [5] Vision: Health Data Publisher Federation

- Imagine a Linked Health Data Cloud, that integrates;
    - Independently published data from Doctors, Hospitals, Clinics, Labs, Insurers, ...



As of September 2020

# [5] Mission: Health IT

- Linked Data implements SOA
  - As RESTful Web Services;
    - That provide access to ***resource representations*** via HTTP's ***uniform interface***, and use ***hyperlinks as the engine of application state*** (HATEOS)
    - Data as a Service (DaaS)
- Linked Data implements PCAST recommendations
  - Health IT Report
    - 'Data Element Access Services' (Faceted Browsing)
  - Universal Exchange Language
    - 'Metadata tagged' (RDF/XML and RDF Schemas)

# [6] Acknowledgements – Special Thanks to:

- HHS
  - CTO Todd Park, OCIO John Teeter, Mary Forbes
  - CMS OCSQ Glenn Sperle
- OMB and GSA
  - Vivek Kundra, Data.gov PMO
- W3C
  - Sir Tim Berners-Lee, Sandro Hawke
- RPI
  - Professor Jim Hendler and the TWC

# [6] Tools We Used – Special Thanks to:

- OpenLinkSW [Virtuoso](#)
  - [Quad store, HTTP conneg / url\\_rewrite rules](#)
  - [Faceted search and browse, REST API's](#)
- Top Quadrant [Top Braid Composer](#)
  - Vocabulary modeling (RDFS), initial (inference/query) testing
  - [Jena \(HP\) schemagen](#) .rdfs to .java, ETL .tsv to .rdf/ttl
- DERI [LiDRC](#)
  - [Google Refine + DERI RDF extension](#)
    - Graph prototyping, source.tsv lifting

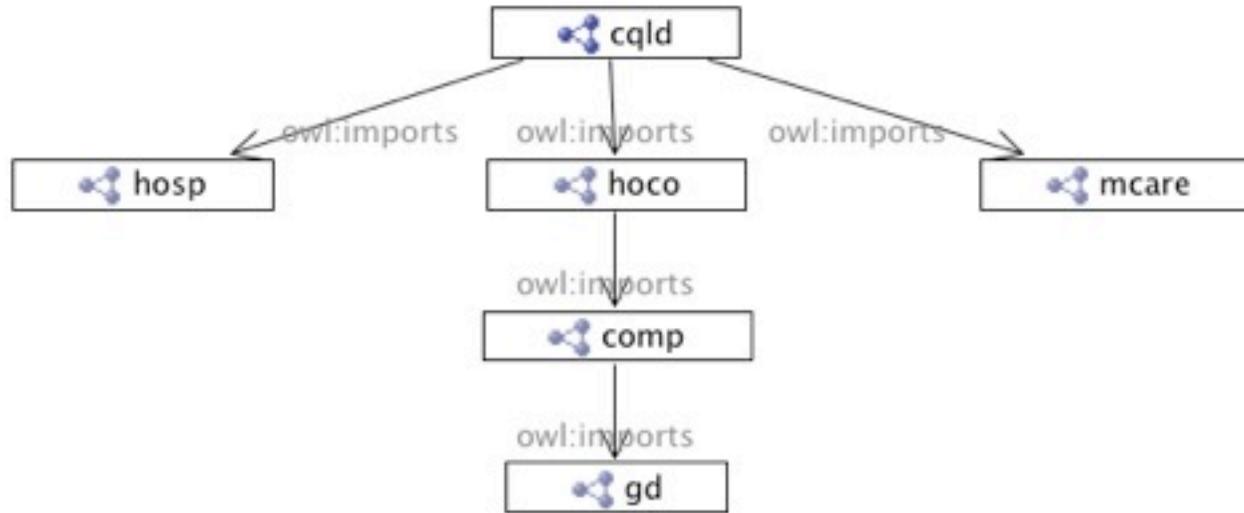
# [7] References – Learn More

- Data.gov
  - <http://www.data.gov/semantic>
  - <http://lodt.w.rpi.edu>
- W3C
  - <http://www.w3.org/wiki/LinkedData>
  - <http://www.w3.org/participate/podcastsvideo.html>
- Community sites
  - <http://linkeddata.org>
  - <http://semanticweb.com>
- Books
  - [Linking Enterprise Data](#)
  - [Evolving the Web into a Global Data Space](#)

# Part II – Demonstration

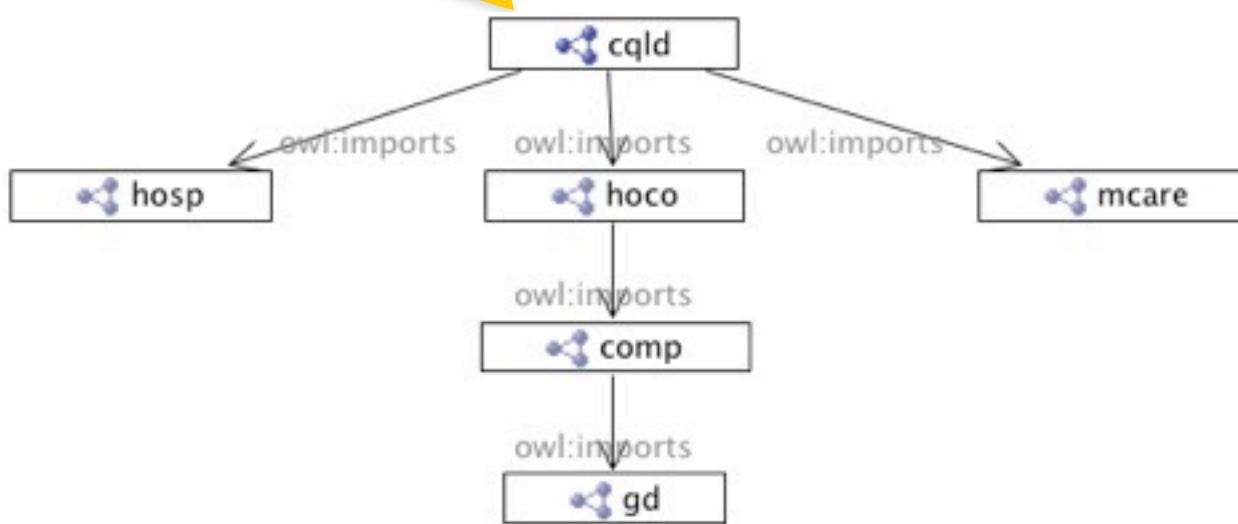
1. Exploring the Vocabularies
2. Exploring the Datasets
3. Exploring Multiple representations
4. Query Points
5. Faceted Search
6. Faceted Browsing
7. Other API's
8. Contact

# [1] Hospital Compare Vocab (RDF Schemas)

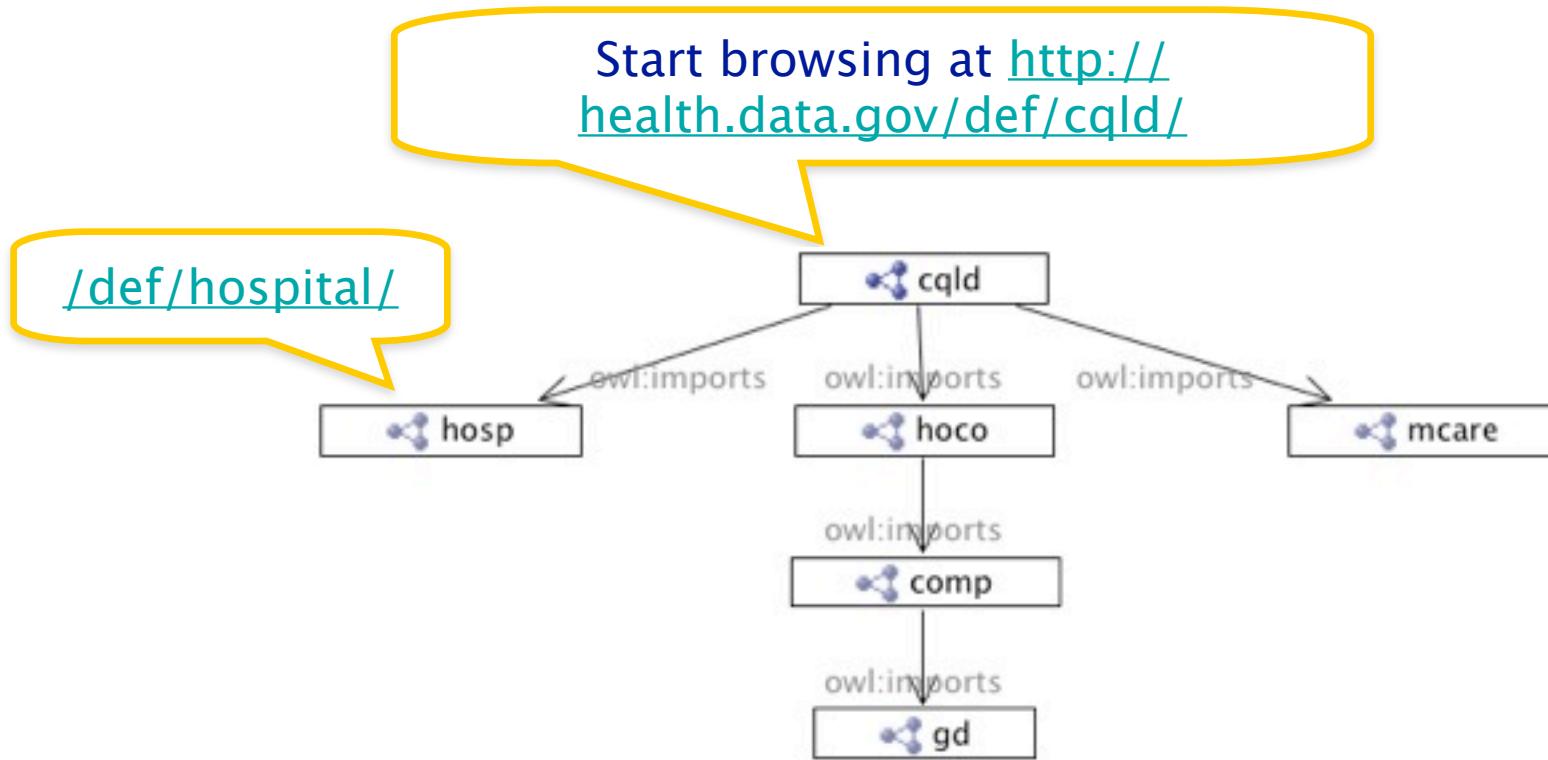


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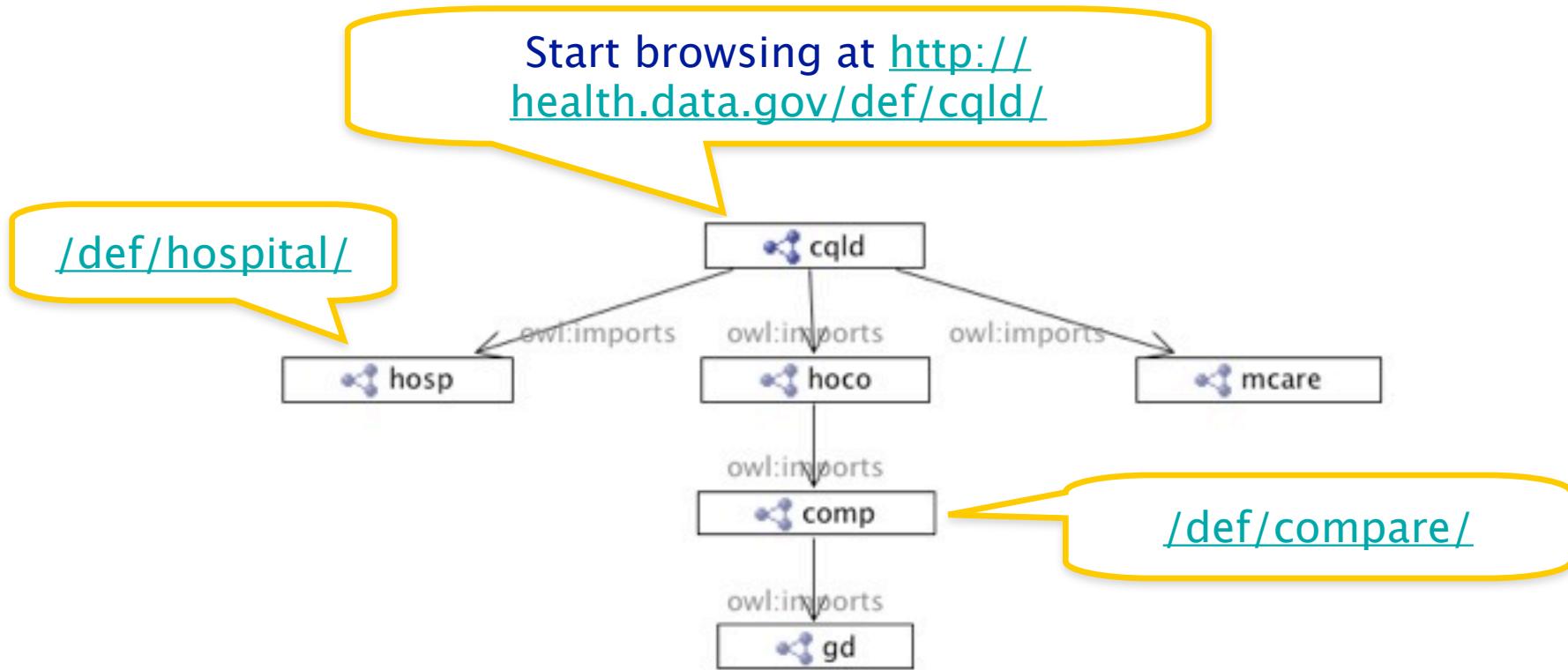
Start browsing at [http://  
health.data.gov/def/cqld/](http://health.data.gov/def/cqld/)



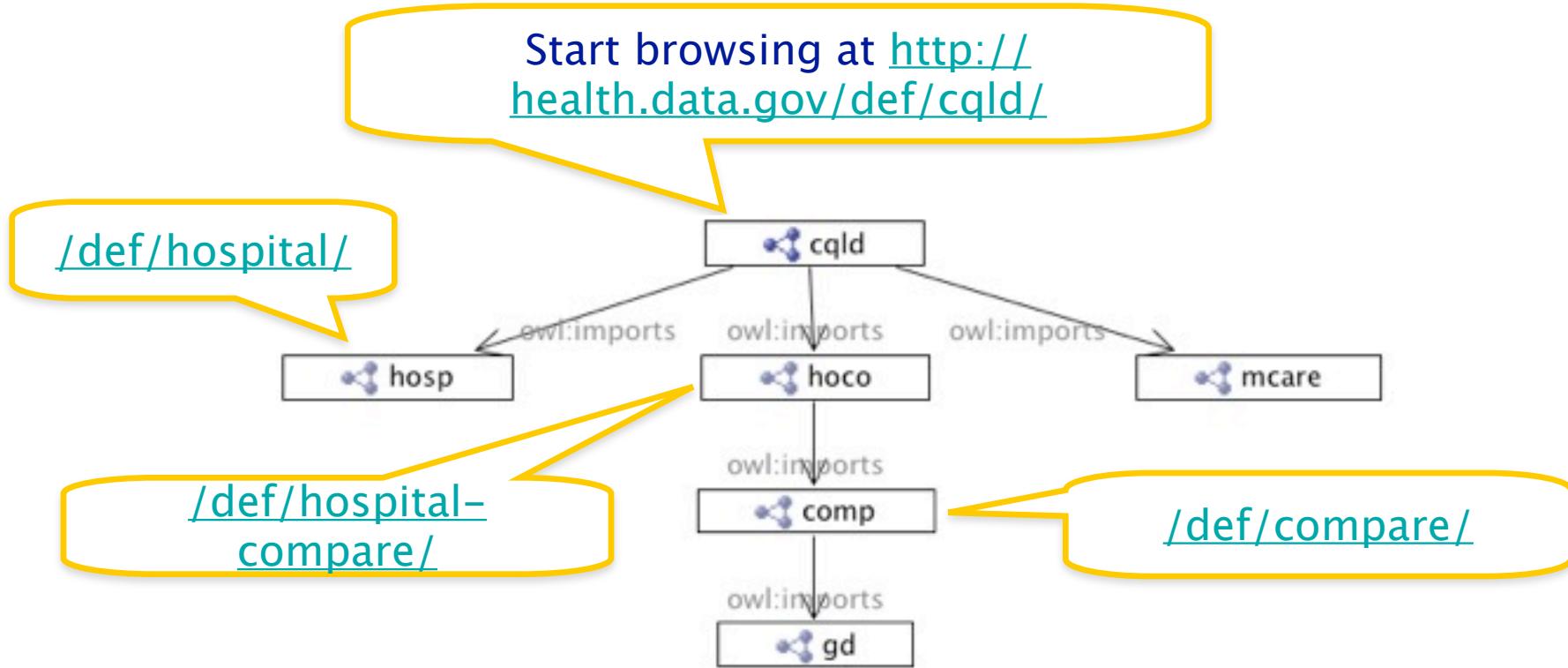
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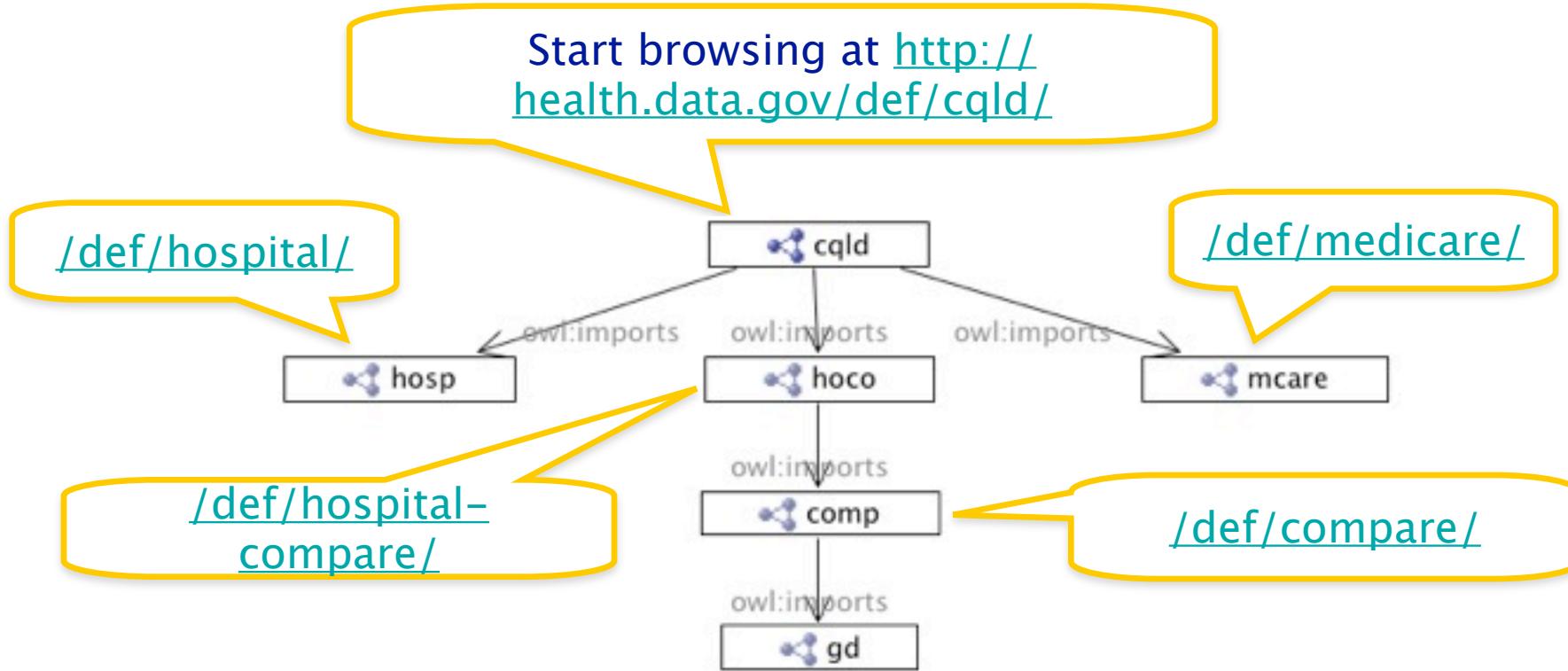
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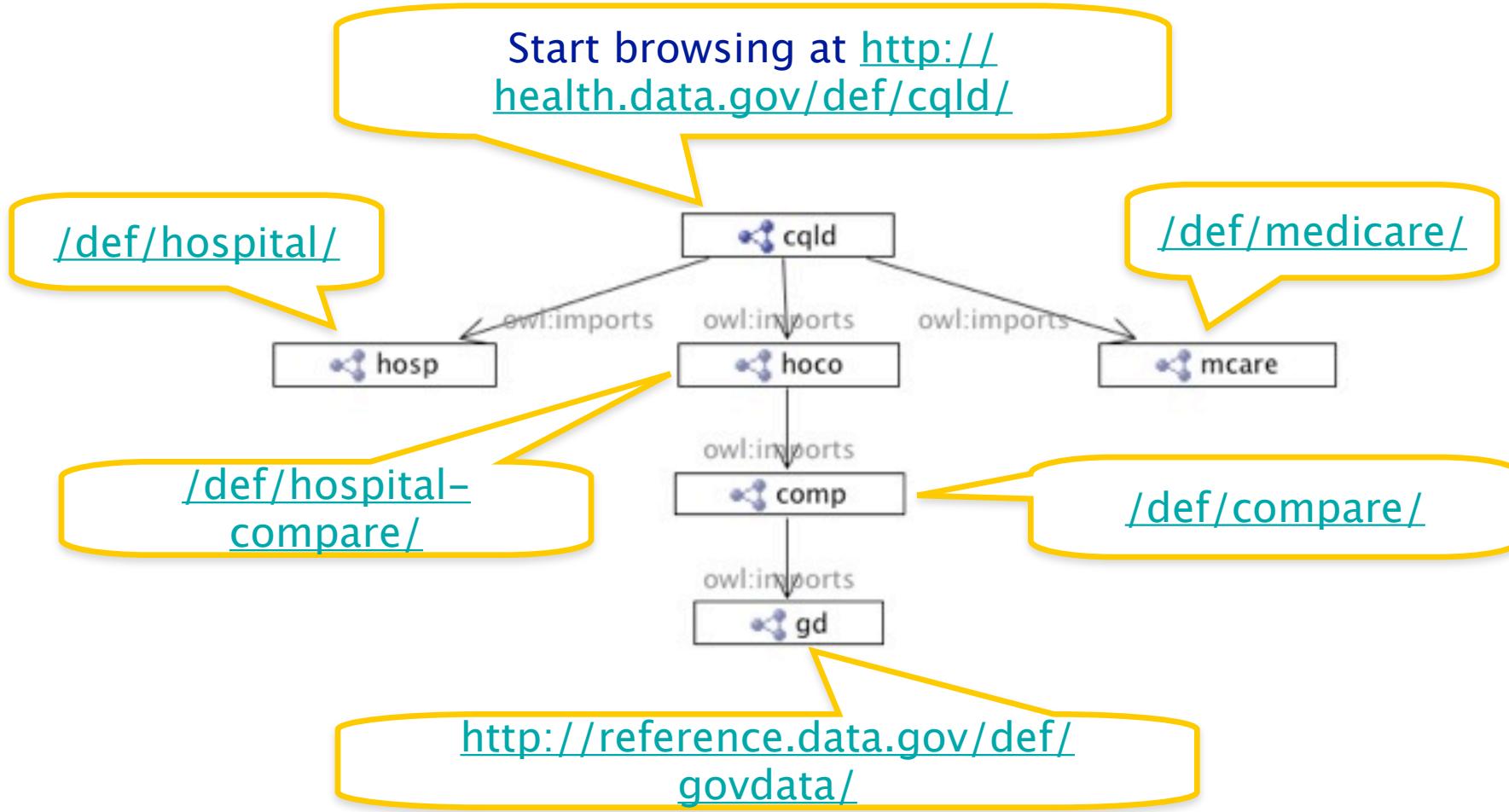
# [1] Hospital Compare Vocab (RDF Schemas)



# [1] Hospital Compare Vocab (RDF Schemas)



# [1] Hospital Compare Vocab (RDF Schemas)



# [1] Downloading Hospital Compare Vocabs

- <http://health.data.gov/def/cqld.rdfs>
  - <http://health.data.gov/def/hospital.rdfs>
  - <http://health.data.gov/def/compare.rdfs>
  - <http://health.data.gov/def/hospital-compare.rdfs>
  - <http://health.data.gov/def/medicare.rdfs>
  - <http://reference.data.gov/def/govdata.rdfs>
- 
- Note: a common (best) practice redirects requests to any classes/properties to their respective locations above...
    - ***We've diverged from this initially to enable data model browsing***
      - ***and provided rdfs:seeAlso links to the vocab.rdfs file URL's above***

# [1] http://health.data.gov/def/cqld/

## About: Clinical Quality Linked Data Vocabulary [🔗](#)

An Entity of Type : Ontology, within Data Space : [health.data.gov](#)

Start faceted browsing from this Type

A RDF Schema that imports and augments concepts and relationships from other Clinical Quality Linked Data vocabularies.

### Attributes

### Values

`rdftype` [owl:Ontology](#)

`rdfslabel` cqld

`imports` [http://www.w3.org/2003/01/geo/wgs84\\_pos](http://www.w3.org/2003/01/geo/wgs84_pos)  
<http://purl.org/dc/terms/>  
<http://rdfs.org/ns/void>  
<http://xmlns.com/foaf/0.1/>  
<http://health.data.gov/def/hospital/>  
xmores

`rdfsIsDefinedBy` [http://health.data.gov/def/cqld/](#)

`rdfscomment` A RDF Schema that imports and augments concepts and relationships from other Clinical Quality Linked Data vocabularies.

`versionInfo` 1.0

`dccontributor` Centers for Medicare and Medicaid Services  
US Department of Health and Human Services

`dctitle` Clinical Quality Linked Data Vocabulary

`dcdescription` A RDF Schema that imports and augments concepts and relationships from other Clinical Quality Linked Data vocabularies.

`is rdfsIsDefinedBy of` [http://health.data.gov/def/cqld/](#)

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## About: Clinical Quality Linked Data Vocabulary

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Attributes	Values
rdf:type	<a href="#">owl:Ontology</a>
rdfs:label	cqld
imports	<a href="http://www.w3.org/2003/01/geo/wgs84_pos">http://www.w3.org/2003/01/geo/wgs84_pos</a> <a href="http://purl.org/dc/terms/">http://purl.org/dc/terms/</a> <a href="http://rdfs.org/ns/void">http://rdfs.org/ns/void</a> <a href="http://xmlns.com/foaf/0.1/">http://xmlns.com/foaf/0.1/</a> <a href="http://health.data.gov/def/hospital/">http://health.data.gov/def/hospital/</a> <a href="#">xmores</a>
rdfs:isDefinedBy	<a href="#">http://health.data.gov/def/cqld/</a>
rdfs:comment	A RDF Schema that imports and augments concepts and relationships from other Clinical Quality Linked Data vocabularies.
versionInfo	1.0
dc:contributor	Centers for Medicare and Medicaid Services US Department of Health and Human Services
dc:title	Clinical Quality Linked Data Vocabulary
dc:description	A RDF Schema that imports and augments concepts and relationships from other Clinical Quality Linked Data vocabularies.
is rdfs:isDefinedBy of	<a href="#">http://health.data.gov/def/cqld/</a>

The [/cqld/](#) vocab is intended as a ‘bridge’ vocabulary – things that relate concepts in other vocabularies are (or will be) specified here as we add more vocabs for other Clinical Quality domains.

At the moment, it mostly just imports the other vocabularies, including those we created and reused, which makes it a convenient starting place when using an ontology editing tool.

# [1] <http://health.data.gov/def/hospital/>

## About: Hospital Vocabulary

An Entity of Type : Ontology, within Data Space : [health.data.gov](http://health.data.gov)  
Start faceted browsing from this Type

A RDF Schema that defines concepts and relationships used for Hospital data.

### Attributes

`rdf:type` [owl:Ontology](#)

`rdfs:label` hospital

`imports` <http://purl.org/dc/elements/1.1/>  
<http://www.w3.org/2006/vcard/ns>  
<http://www.w3.org/ns/org>

`rdfs:isDefinedBy` <http://health.data.gov/def/hospital/>

`rdfs:comment` A RDF Schema that defines concepts and relationships used for Hospital data.

`versionInfo` 1.0

`dc:contributor` Centers for Medicare and Medicaid Services  
US Department of Health and Human Services

`dc:title` Hospital Vocabulary

`dc:description` A RDF Schema that defines concepts and relationships used for Hospital data.

`is imports of` <http://health.data.gov/def/cqld/>

`is rdfs:isDefinedBy of` [hosp:cacProvider](#)

[hosp:Hospital](#)  
<http://health.data.gov/def/hospital/>  
[hosp:accreditation](#)  
[hosp:site](#)  
[xmorex](#)

# [1] http://health.data.gov/def/hospital/

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Attributes	Values
rdf:type	<a href="#">owl:Ontology</a>
rdfs:label	hospital
imports	<a href="http://purl.org/dc/elements/1.1/">http://purl.org/dc/elements/1.1/</a> <a href="http://www.w3.org/2006/vcard/ns">http://www.w3.org/2006/vcard/ns</a> <a href="http://www.w3.org/ns/org">http://www.w3.org/ns/org</a>
rdfs:isDefinedBy	<a href="#">http://health.data.gov/def/hospital/</a>
rdfs:comment	A RDF Schema that defines concepts and relationships used for Hos
versionInfo	1.0
dc:contributor	Centers for Medicare and Medicaid Services US Department of Health and Human Services
dc:title	Hospital Vocabulary
dc:description	A RDF Schema that defines concepts and relationships used for Hospital data.
is imports of	<a href="#">http://health.data.gov/def/cqld/</a>
is rdfs:isDefinedBy of	<a href="#">hosp:cacProvider</a> <a href="#">hosp:Hospital</a> <a href="#">http://health.data.gov/def/hospital/</a> <a href="#">hosp:accreditation</a> <a href="#">hosp:site</a> <a href="#">xmorex</a>

The [/hospital/](#) vocab contains mostly properties that capture values for general hospital information, and categorize the kind of ownership and types of services a hospital provides.

# [1] http://health.data.gov/def/compare/

## About: Compare Vocabulary

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A RDF Schema that defines concepts and relationships used for comparing Clinical Quality Linked Data.

Attributes	Values
rdf:type	<a href="#">owl:Ontology</a>
rdfs:label	compare
imports	<a href="#">http://reference.data.gov/def/govdata/</a>
rdfs:isDefinedBy	<a href="#">http://health.data.gov/def/compare/</a>
rdfs:comment	A RDF Schema that defines concepts and relationships used for comparing Clinical Quality Linked Data.
versionInfo	1.0
dc:contributor	Centers for Medicare and Medicaid Services US Department of Health and Human Services
dc:title	Compare Vocabulary
dc:description	A RDF Schema that defines concepts and relationships used for comparing Clinical Quality Linked Data.
is imports of	<a href="#">http://health.data.gov/def/hospital-compare/</a>
is rdfs:isDefinedBy of	<a href="#">http://health.data.gov/def/compare/</a> <a href="#">comp:CACMeasure</a> <a href="#">comp:condition</a> <a href="#">comp:metric</a> <a href="#">comp:measure</a> <a href="#">comp:Metric</a> <a href="#">comp:Condition</a> <a href="#">comp:footnote</a> <a href="#">comp:Footnote</a> <a href="#">comp:ProcessMeasure</a> <a href="#">comp:SurveyMetric</a> <a href="#">comp:SurveyMeasure</a> <a href="#">comp:Measure</a> <a href="#">comp:EfficiencyMeasure</a> <a href="#">comp:StructuralMeasure</a> <a href="#">comp:OutcomeMeasure</a> <a href="#">comp:performance</a> <a href="#">comp:rate</a>

# [1] http://health.data.gov/def/compare/

## About: Compare Vocabulary

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Attributes	Values
rdf:type	<a href="#">owl:Ontology</a>
rdfs:label	compare
imports	<a href="#">http://reference.data.gov/def/govdata/</a>
rdfs:isDefinedBy	<a href="#">http://health.data.gov/def/compare/</a>
rdfs:comment	A RDF Schema that defines concepts and relationships used for comparing Clinical Quality Linked Data.
versionInfo	1.0
dc:contributor	Centers for Medicare and Medicaid Services US Department of Health and Human Services
dc:title	Compare Vocabulary
dc:description	A RDF Schema that defines concepts and relationships used for comparing Clinical Quality Linked
is imports of	<a href="#">http://health.data.gov/def/hospital-compare/</a>
is rdfs:isDefinedBy of	<a href="#">http://health.data.gov/def/compare/</a> <a href="#">comp:CACTMeasure</a> <a href="#">comp:condition</a> <a href="#">comp:metric</a> <a href="#">comp:measure</a> <a href="#">comp:Metric</a> <a href="#">comp:Condition</a> <a href="#">comp:footnote</a> <a href="#">comp:Footnote</a> <a href="#">comp:ProcessMeasure</a> <a href="#">comp:SurveyMetric</a> <a href="#">comp:SurveyMeasure</a> <a href="#">comp:Measure</a> <a href="#">comp:EfficiencyMeasure</a> <a href="#">comp:StructuralMeasure</a> <a href="#">comp:OutcomeMeasure</a> <a href="#">comp:performance</a> <a href="#">comp:rate</a>

The [/compare/](#) vocab contains general classes that are relevant to any Clinical Quality domain, not just hospitals – such as [Conditions](#), [Measures](#), and [Metrics](#).

These concepts get subclassed in the [/hospital-compare/](#) vocab, where they're specialized for the Hospital domain.

# [1] http://health.data.gov/def/compare/

## About: Compare Vocabulary

An Entity of Type : [Ontology](#), within Data Space : [health.data.gov](#)  
Start faceted browsing from this Type

A RDF Schema that defines concepts and relationships used for comparing Clinical Quality Linked

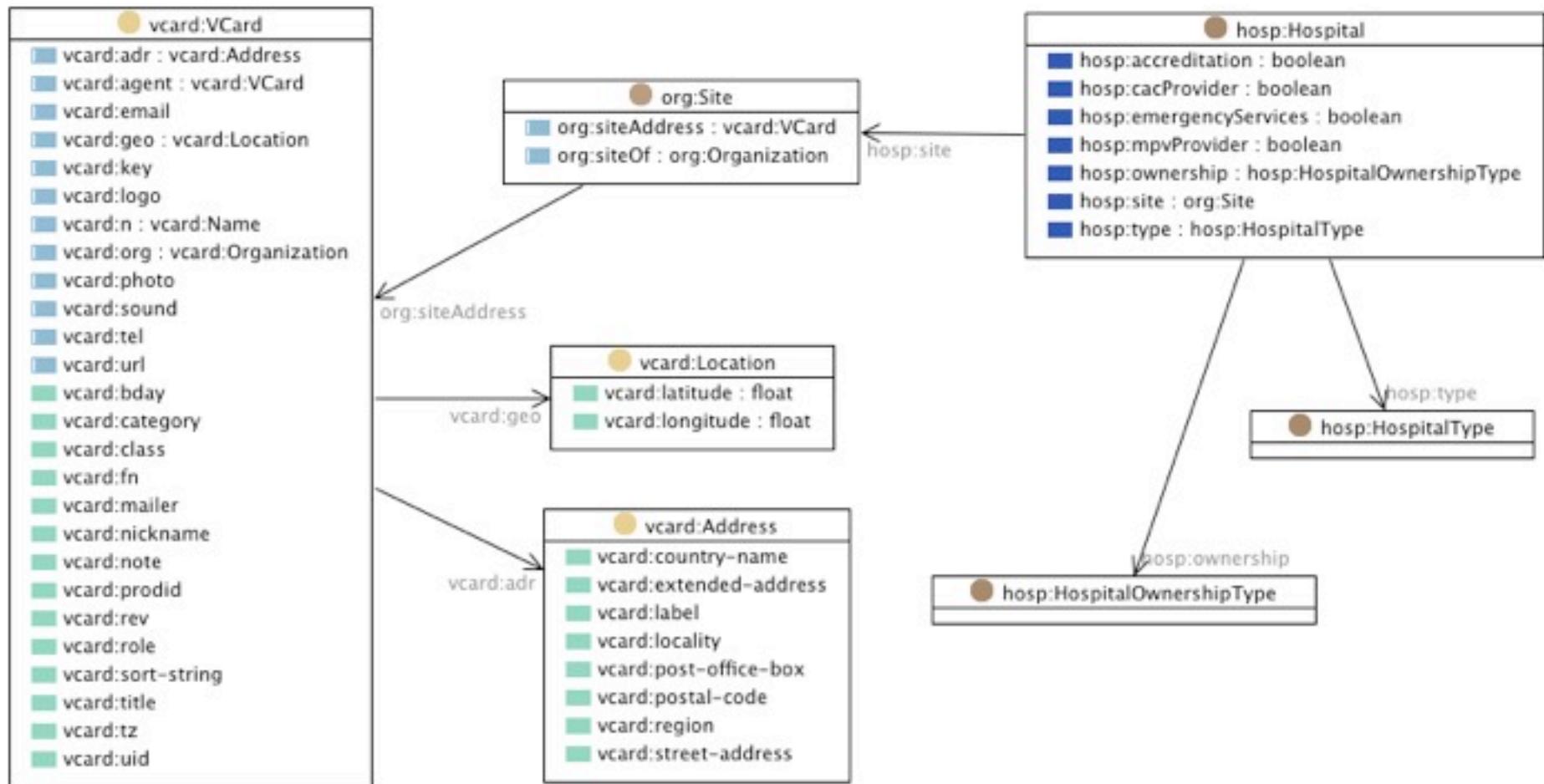
Attributes	Values
rdf:type	<a href="#">owl:Ontology</a>
rdfs:label	compare
imports	<a href="#">http://reference.data.gov/def/govdata/</a>
rdfs:isDefinedBy	<a href="#">http://health.data.gov/def/compare/</a>
rdfs:comment	A RDF Schema that defines concepts and relationships used for comparing Clinical Quality Linked Data.
versionInfo	1.0
dc:contributor	Centers for Medicare and Medicaid Services US Department of Health and Human Services
dc:title	Compare Vocabulary
dc:description	A RDF Schema that defines concepts and relationships used for comparing Clinical Quality Linked
is imports of	<a href="#">http://health.data.gov/def/hospital-compare/</a>
is rdfs:isDefinedBy of	<a href="#">http://health.data.gov/def/compare/</a> <a href="#">comp:CACMeasure</a> <a href="#">comp:condition</a> <a href="#">comp:metric</a> <a href="#">comp:measure</a> <a href="#">comp:Metric</a> <a href="#">comp:Condition</a> <a href="#">comp:footnote</a> <a href="#">comp:Footnote</a> <a href="#">comp:ProcessMeasure</a> <a href="#">comp:SurveyMetric</a> <a href="#">comp:SurveyMeasure</a> <a href="#">comp:Measure</a> <a href="#">comp:EfficiencyMeasure</a> <a href="#">comp:StructuralMeasure</a> <a href="#">comp:OutcomeMeasure</a> <a href="#">comp:performance</a> <a href="#">comp:rate</a>

A general purpose vocabulary called [/govdata/](#) captures classes that are common to all open government data.

The [/compare/](#) vocab contains general classes that are relevant to any Clinical Quality domain, not just hospitals – such as [Conditions](#), [Measures](#), and [Metrics](#).

These concepts get subclassed in the [/hospital-compare/](#) vocab, where they're specialized for the Hospital domain.

# [1] A Class View of Hospital Information



# [1] <http://health.data.gov/def/hospital/Hospital>

## About: Hospital

An Entity of Type : Class, within Data Space : [health.data.gov](#)  
Start faceted browsing from this Type

### Attributes    Values

`rdf:type` [rdfs:Class](#)

`rdfs:label` Hospital

`rdfs:isDefinedBy` <http://health.data.gov/def/hospital/>

`rdfs:subClassOf` [rdfs:Resource](#)

`disjointWith` [gd:Country](#)  
[hoco:Record](#)  
[hoco:RecordSet](#)  
[gd:State](#)  
<http://www.w3.org/ns/org#Organization>

`is rdf:type of` <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[+more»](#)

[« First](#)

[« Prev](#)

[Next »](#)

[Last »»](#)

Page 1 of 48

1

[Go](#)

Explore alternative Linked Data Views & Meshups using: [OpenLink Data Explorer](#) | Raw Data in: [CXML](#) | [CSV](#) | [RDF \( N-Triples N3/Turtle JSON XML \)](#) | [OData \( Atom JSON \)](#) | [About](#)



# [1] <http://health.data.gov/def/hospital/Hospital>

## About: Hospital

An Entity of Type : Class, within Data Space : [health.data.gov](#)  
Start faceted browsing from this Type

### Attributes    Values

rdf:type rdfs:Class

rdfs:label Hospital

rdfs:isDefinedBy <http://health.data.gov/def/hospital/>

rdfs:subClassOf rdfs:Resource

disjointWith gd:Country  
hoco:Record  
hoco:RecordSet  
gd:State  
<http://www.w3.org/ns/org#Organization>

is rdf:type of <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[+more»](#)

The default html view of any class within any vocabulary, (like [hosp:Hospital](#) shown here) will provide some metadata about the class (like what vocab it's defined by), and will also provide a list of instances you can page through or click to access.

« First    « Prev    [Next](#) »    Last »    Page 1 of 48    1    Go

Explore alternative Linked Data Views & Meshups using: [OpenLink Data Explorer](#)    Raw Data in: CXML | CSV | RDF ( N-Triples N3/Turtle JSON XML ) | OData ( Atom JSON )    About

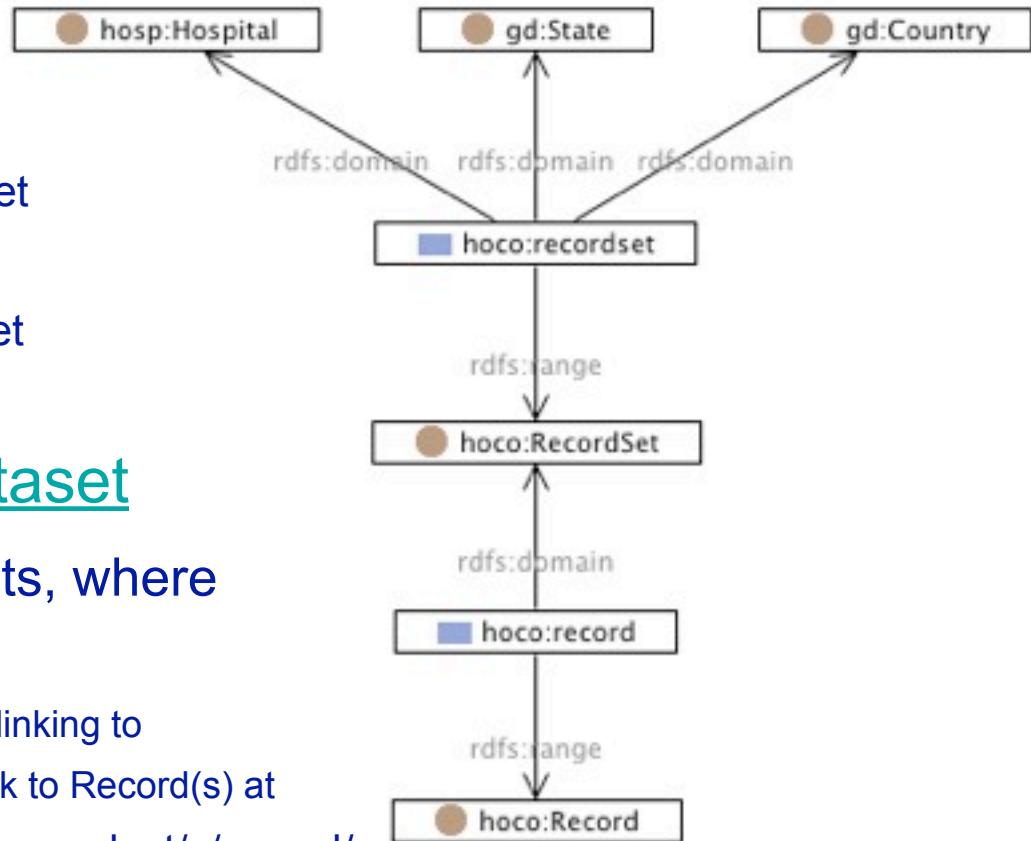


# [2] Exploring Datasets Over Time

- Get a list of all the source RDF/XML files
  - <http://health.data.gov/dataset>
- Click on one
  - To see its foaf:homepage, like
    - <http://health.data.gov/dataset/cacp>
  - Then select a void:Dataset with any dcterms:issued date
    - <http://health.data.gov/dataset/cacp/2010-11-16>
  - Then follow the void:exampleResource link to
    - <http://health.data.gov/dataset/cacp/2010-11-16/recordset/1/record/1>
  - To look at the data in one of its hoco:Record(s)

## [2] Getting to all Hospital/State/Country Record Data

- Metadata triples (SPO)
  - ‘traversing the graph’
    - Hospital recordset RecordSet
    - State recordset RecordSet
    - Country recordset RecordSet
      - RecordSet record Record



- <http://health.data.gov/dataset>

- Returns a list of all datasets, where
  - /dataset/name/yyyy-mm-dd
    - are void:Dataset(s), each linking to
    - RecordSet(s) that each link to Record(s) at
  - /dataset/name/yyyy-mm-dd/recordset/x/record/y
- <http://health.data.gov/dataset/cacp/2010-11-16/recordset/1/record/1>

# [2] <http://health.data.gov/dataset>

## Attributes Values

rdf:type	foaf:Document
foaf:homepage	<a href="http://health.data.gov/dataset/cacn">http://health.data.gov/dataset/cacn</a> <a href="http://health.data.gov/dataset/cacop">http://health.data.gov/dataset/cacop</a> <a href="http://health.data.gov/dataset/cacp">http://health.data.gov/dataset/cacp</a> <a href="http://health.data.gov/dataset/cacs">http://health.data.gov/dataset/cacs</a> <a href="http://health.data.gov/dataset/cn">http://health.data.gov/dataset/cn</a> <a href="http://health.data.gov/dataset/cp">http://health.data.gov/dataset/cp</a> <a href="http://health.data.gov/dataset/cs">http://health.data.gov/dataset/cs</a> <a href="http://health.data.gov/dataset/hn">http://health.data.gov/dataset/hn</a> <a href="http://health.data.gov/dataset/hophc">http://health.data.gov/dataset/hophc</a> <a href="http://health.data.gov/dataset/hophp">http://health.data.gov/dataset/hophp</a> <a href="http://health.data.gov/dataset/hopnp">http://health.data.gov/dataset/hopnp</a> <a href="http://health.data.gov/dataset/hopqdrpq">http://health.data.gov/dataset/hopqdrpq</a> <a href="http://health.data.gov/dataset/hopsp">http://health.data.gov/dataset/hopsp</a> <a href="http://health.data.gov/dataset/hosp">http://health.data.gov/dataset/hosp</a> <a href="http://health.data.gov/dataset/hp">http://health.data.gov/dataset/hp</a> <a href="http://health.data.gov/dataset/hpv">http://health.data.gov/dataset/hpv</a> <a href="http://health.data.gov/dataset/hs">http://health.data.gov/dataset/hs</a> <a href="http://health.data.gov/dataset/mpvop">http://health.data.gov/dataset/mpvop</a> <a href="http://health.data.gov/dataset/npy">http://health.data.gov/dataset/npy</a> <a href="http://health.data.gov/dataset/on">http://health.data.gov/dataset/on</a> <a href="http://health.data.gov/dataset/op">http://health.data.gov/dataset/op</a> <a href="http://health.data.gov/dataset/os">http://health.data.gov/dataset/os</a> <a href="http://health.data.gov/dataset/ppv">http://health.data.gov/dataset/ppv</a> <a href="http://health.data.gov/dataset/q">http://health.data.gov/dataset/q</a> <a href="http://health.data.gov/dataset/sm">http://health.data.gov/dataset/sm</a> <a href="http://health.data.gov/dataset/spv">http://health.data.gov/dataset/spv</a>

## [2] <http://health.data.gov/dataset>

### Attributes Values

rdf:type foaf:Document

foaf:homepage <http://health.data.gov/dataset/cacn>  
<http://health.data.gov/dataset/cacop>  
<http://health.data.gov/dataset/cacp>  
<http://health.data.gov/dataset/cacs>  
<http://health.data.gov/dataset/cn>  
<http://health.data.gov/dataset/cp>  
<http://health.data.gov/dataset/cs>  
<http://health.data.gov/dataset/hn>  
<http://health.data.gov/dataset/hophc>  
<http://health.data.gov/dataset/hophp>  
<http://health.data.gov/dataset/hopnp>  
<http://health.data.gov/dataset/hopqdrpq>  
<http://health.data.gov/dataset/hopsp>  
<http://health.data.gov/dataset/hosp>  
<http://health.data.gov/dataset/hp>  
<http://health.data.gov/dataset/hpv>  
<http://health.data.gov/dataset/hs>  
<http://health.data.gov/dataset/mpvop>  
<http://health.data.gov/dataset/npy>  
<http://health.data.gov/dataset/on>  
<http://health.data.gov/dataset/op>  
<http://health.data.gov/dataset/os>  
<http://health.data.gov/dataset/ppv>  
<http://health.data.gov/dataset/q>  
<http://health.data.gov/dataset/sm>  
<http://health.data.gov/dataset/spv>

Go to:

<http://health.data.gov/dataset>

to get a list of all the available  
source data files

# [2] <http://health.data.gov/dataset>

## Attributes Values

rdf:type foaf:Document

foaf:homepage <http://health.data.gov/dataset/cacn>  
<http://health.data.gov/dataset/cacop>  
<http://health.data.gov/dataset/cacp> Let's check out /cacp  
<http://health.data.gov/dataset/cacs>  
<http://health.data.gov/dataset/cn>  
<http://health.data.gov/dataset/cp>  
<http://health.data.gov/dataset/cs>  
<http://health.data.gov/dataset/hn>  
<http://health.data.gov/dataset/hophc>  
<http://health.data.gov/dataset/hophp>  
<http://health.data.gov/dataset/hopnp>  
<http://health.data.gov/dataset/hopqdrpq>  
<http://health.data.gov/dataset/hopsp>  
<http://health.data.gov/dataset/hosp>  
<http://health.data.gov/dataset/hp>  
<http://health.data.gov/dataset/hpv>  
<http://health.data.gov/dataset/hs>  
<http://health.data.gov/dataset/mpvop>  
<http://health.data.gov/dataset/npy>  
<http://health.data.gov/dataset/on>  
<http://health.data.gov/dataset/op>  
<http://health.data.gov/dataset/os>  
<http://health.data.gov/dataset/ppv>  
<http://health.data.gov/dataset/q>  
<http://health.data.gov/dataset/sm>  
<http://health.data.gov/dataset/spv>

Let's check out /cacp

Go to:

<http://health.data.gov/dataset>

to get a list of all the available  
source data files

# [2] http://health.data.gov/dataset/cacp

[Description](#)[Usage Statistics](#)[Settings](#)

## About: Childrens Asthma Care Providers (CACP)

An Entity of Type : Document, within Data Space : [health.data.gov](#)

Start faceted browsing from this Type

### Attributes

`rdf:type` [foaf:Document](#)

`rdfs:label` CACP

`foaf:primaryTopic` [hosp:Hospital](#)

`dcterms:title` Childrens Asthma Care Providers (CACP)

`dcterms:description` Information about hospitals that provide care for children's asthma.

`void:vocabulary` [http://health.data.gov/def/compare\\_rdfs](#)

`void:dataset` [http://health.data.gov/dataset/cacp/2010-11-16](#)  
[http://health.data.gov/dataset/cacp/2011-02-15](#)

`is foaf:homepage of` [http://health.data.gov/dataset](#)  
[http://health.data.gov/dataset/cacp/2010-11-16](#)  
[http://health.data.gov/dataset/cacp/2011-02-15](#)

Alternative Linked Data View: [iSPARQL](#) | Raw Data in: [CSV](#) | [RDF \( N-Triples N3/Turtle JSON XML \)](#) | [ODATA \( Atom JSON \)](#) | [About](#)



# [2] http://health.data.gov/dataset/cacp

[Description](#)[Usage Statistics](#)[Settings](#)

## About: Childrens Asthma Care Providers (CACP)

An Entity of Type : Document, within Data Space : [health.data.gov](#)

Start faceted browsing from this Type

Attributes	Values
rdf:type	foaf:Document
rdfs:label	CACP
foaf:primaryTopic	<a href="#">hosp:Hospital</a>
dcterms:title	Childrens Asthma Care Providers (CACP)
dcterms:description	Information about hospitals that provide care for children's asthma.
void:vocabulary	<a href="#">http://health.data.gov/def/compare.rdf</a>
void:dataset	<a href="#">http://health.data.gov/dataset/cacp/2010-11-16</a> <a href="#">http://health.data.gov/dataset/cacp/2011-02-15</a>
is foaf:homepage of	<a href="#">http://health.data.gov/dataset</a> <a href="#">http://health.data.gov/dataset/cacp/2010-11-16</a> <a href="#">http://health.data.gov/dataset/cacp/2011-02-15</a>

Follow the link from the /cacp homepage to a dataset issued on a particular /yyyy-mm-dd date – these will accumulate over time...

Alternative Linked Data View: [iSPARQL](#) Raw Data in: [CSV](#) | [RDF \( N-Triples N3/Turtle JSON XML \)](#) | [OData \( Atom JSON \)](#) | [About](#)



## [2] <http://health.data.gov/dataset/cacp/2011-02-15>

### About: Childrens Asthma Care Providers (CACP)

An Entity of Type : Dataset, within Data Space : [health.data.gov](http://health.data.gov)

[Start faceted browsing from this Type](#)

*Information about hospitals that provide care for children's asthma.*

Attributes	Values
rdf:type	<a href="#">void:Dataset</a>
rdfs:label	CACP
rdfs:comment	Information about hospitals that provide care for children's asthma.
foaf:homepage	<a href="http://health.data.gov/dataset/cacp">http://health.data.gov/dataset/cacp</a>
foaf:primaryTopic	<a href="#">hosp:Hospital</a>
dcterms:title	Childrens Asthma Care Providers (CACP)
dcterms:description	Information about hospitals that provide care for children's asthma.
dcterms:issued	2011-02-15(xsd:date)
dcterms:source	<a href="http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.txt">http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.txt</a>
void:sparqlEndpoint	<a href="http://health.data.gov/sparql">http://health.data.gov/sparql</a>
void:dataDump	<a href="http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.rdf">http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.rdf</a>
void:vocabulary	<a href="http://health.data.gov/def/compare.rdfs">http://health.data.gov/def/compare.rdfs</a>
void:exampleResource	<a href="http://health.data.gov/dataset/cacp/2011-02-15/recordses/20/record/3">http://health.data.gov/dataset/cacp/2011-02-15/recordses/20/record/3</a>
void:triples	3682(xsd:integer)
void:entities	822(xsd:integer)
void:classes	6(xsd:integer)

## [2] <http://health.data.gov/dataset/cacp/2011-02-15>

### About: Childrens Asthma Care Providers (CACP)

An Entity of Type : Dataset, within Data Space : [health.data.gov](http://health.data.gov)

[Start faceted browsing from this Type](#)

Information about hospitals that provide care for children's asthma.

Attributes	Values
rdf:type	<a href="#">void:Dataset</a>
rdfs:label	CACP
rdfs:comment	Information about hospitals that provide care for children's asthma.
foaf:homepage	<a href="http://health.data.gov/dataset/cacp">http://health.data.gov/dataset/cacp</a>
foaf:primaryTopic	<a href="#">hosp:Hospital</a>
dcterms:title	Childrens Asthma Care Providers (CACP)
dcterms:description	Information about hospitals that provide care for children's asthma.
dcterms:issued	2011-02-15(xsd:date)
dcterms:source	<a href="http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.txt">http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.txt</a>
void:sparqlEndpoint	<a href="http://health.data.gov/sparql">http://health.data.gov/sparql</a>
void:dataDump	<a href="http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.rdf">http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.rdf</a>
void:vocabulary	<a href="http://health.data.gov/def/compare.rdfs">http://health.data.gov/def/compare.rdfs</a>
void:exampleResource	<a href="http://health.data.gov/dataset/cacp/2011-02-15/recordses/20/record/3">http://health.data.gov/dataset/cacp/2011-02-15/recordses/20/record/3</a>
void:triples	3682(xsd:integer)
void:entities	822(xsd:integer)
void:classes	6(xsd:integer)

There's lots of metadata about this /cacp/yyyy-mm-dd dataset release

## [2] <http://health.data.gov/dataset/cacp/2011-02-15>

### About: Childrens Asthma Care Providers (CACP)

An Entity of Type : Dataset, within Data Space : [health.data.gov](http://health.data.gov)

[Start faceted browsing from this Type](#)

Information about hospitals that provide care for children's asthma.

Attributes	Values
rdf:type	<a href="#">void:Dataset</a>
rdfs:label	CACP
rdfs:comment	Information about hospitals that provide care for children's asthma.
foaf:homepage	<a href="http://health.data.gov/dataset/cacp">http://health.data.gov/dataset/cacp</a>
foaf:primaryTopic	<a href="#">hosp:Hospital</a>
dcterms:title	Childrens Asthma Care Providers (CACP)
dcterms:description	Information about hospitals that provide care for children's asthma.
dcterms:issued	2011-02-15(xsd:date)
dcterms:source	<a href="http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.txt">http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.txt</a>
void:sparqlEndpoint	<a href="http://health.data.gov/sparql">http://health.data.gov/sparql</a>
void:dataDump	<a href="http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.rdf">http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.rdf</a>
void:vocabulary	<a href="http://health.data.gov/def/compare.rdfs">http://health.data.gov/def/compare.rdfs</a>
void:exampleResource	<a href="http://health.data.gov/dataset/cacp/2011-02-15/recordses/20/record/3">http://health.data.gov/dataset/cacp/2011-02-15/recordses/20/record/3</a>
void:triples	3682(xsd:integer)
void:entities	822(xsd:integer)
void:classes	6(xsd:integer)

There's lots of  
metadata about this  
`/cacp/yyyy-mm-dd`  
dataset release

Download the full  
dataset

## [2] <http://health.data.gov/dataset/cacp/2011-02-15>

### About: Childrens Asthma Care Providers (CACP)

An Entity of Type : Dataset, within Data Space : [health.data.gov](http://health.data.gov)

[Start faceted browsing from this Type](#)

Information about hospitals that provide care for children's asthma.

Attributes	Values
rdf:type	<a href="#">void:Dataset</a>
rdfs:label	CACP
rdfs:comment	Information about hospitals that provide care for children's asthma.
foaf:homepage	<a href="http://health.data.gov/dataset/cacp">http://health.data.gov/dataset/cacp</a>
foaf:primaryTopic	<a href="#">hosp:Hospital</a>
dcterms:title	Childrens Asthma Care Providers (CACP)
dcterms:description	Information about hospitals that provide care for children's asthma.
dcterms:issued	2011-02-15(xsd:date)
dcterms:source	<a href="http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.txt">http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.txt</a>
void:sparqlEndpoint	<a href="http://health.data.gov/sparql">http://health.data.gov/sparql</a>
void:dataDump	<a href="http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.rdf">http://health.data.gov/dataset/cacp/2011-02-15/Final_CAC_Provider_File_2011_02_15.rdf</a>
void:vocabulary	<a href="http://health.data.gov/def/compare.rdfs">http://health.data.gov/def/compare.rdfs</a>
void:exampleResource	<a href="http://health.data.gov/dataset/cacp/2011-02-15/recordses/20/record/3">http://health.data.gov/dataset/cacp/2011-02-15/recordses/20/record/3</a>
void:triples	3682(xsd:integer)
void:entities	822(xsd:integer)
void:classes	6(xsd:integer)

There's lots of metadata about this /cacp/yyyy-mm-dd dataset release

Download the full dataset

Let's go to an example resource it contains...

## [2] http://health.data.gov/dataset/cacp/2011-02-15/recordset/20/record/3



Description Usage Statistics Settings

### About: http://health.data.gov/dataset/cacp/2011-02-15/recordset/20/record/3

An Entity of Type : Record, within Data Space : health.data.gov

Start faceted browsing from this Type

#### Attributes

	Values
rdf:type	hoco:Record
percentage	39(xsd:double)
condition	<a href="http://health.data.gov/id/condition/5">http://health.data.gov/id/condition/5</a>
measure	<a href="http://health.data.gov/id/measure/35">http://health.data.gov/id/measure/35</a>
denominator	131(xsd:double)
is record of	<a href="http://health.data.gov/dataset/cacp/2011-02-15/recordset/20">http://health.data.gov/dataset/cacp/2011-02-15/recordset/20</a>
is void:exampleResource of	<a href="http://health.data.gov/dataset/cacp/2011-02-15">http://health.data.gov/dataset/cacp/2011-02-15</a>

Alternative Linked Data View: [SPARQL](#) Raw Data in: [CSV](#) | [RDF](#) ( [N-Triples](#) [N3/Turtle](#) [JSON](#) [XML](#) ) | [OData](#) ( [Atom](#) [JSON](#) ) | [About](#)

## [2] http://health.data.gov/dataset/cacp/2011-02-15/recordset/20/record/3

[Description](#)[Usage Statistics](#)[Settings](#)

### About: http://health.data.gov/dataset/cacp/2011-02-15/recordset/20/record/3

An Entity of Type : Record, within Data Space : health.data.gov

Start faceted browsing from this Type

#### Attributes

	Values
rdf:type	hoco:Record
percentage	39(xsd:double)
condition	<a href="http://health.data.gov/id/condition/5">http://health.data.gov/id/condition/5</a>
measure	<a href="http://health.data.gov/id/measure/35">http://health.data.gov/id/measure/35</a>
denominator	131(xsd:double)
is record of	<a href="http://health.data.gov/dataset/cacp/2011-02-15/recordset/20">http://health.data.gov/dataset/cacp/2011-02-15/recordset/20</a>
is void:exampleResource of	<a href="http://health.data.gov/dataset/cacp/2011-02-15">http://health.data.gov/dataset/cacp/2011-02-15</a>

National, State, and Hospital Records group data values around specific Measures and Metrics for specific Conditions

# [3] http://health.data.gov/doc/hospital/393303

## About: CHILDREN'S HOSPITAL OF PHILADELPHIA

An Entity of Type : Hospital, within Data Space : health.data.gov

Start faceted browsing from this Type

---

Attributes	Values
rdf:type	hosp:Hospital
rdfs:label	CHILDREN'S HOSPITAL OF PHILADELPHIA
recordset	<a href="http://health.data.gov/dataset/cacp/2010-11-24/recordset/119">http://health.data.gov/dataset/cacp/2010-11-24/recordset/119</a> <a href="http://health.data.gov/dataset/cacp/2011-02-25/recordset/123">http://health.data.gov/dataset/cacp/2011-02-25/recordset/123</a> <a href="http://health.data.gov/dataset/cacp/2010-11-16/recordset/119">http://health.data.gov/dataset/cacp/2010-11-16/recordset/119</a> <a href="http://health.data.gov/dataset/cacp/2011-02-15/recordset/123">http://health.data.gov/dataset/cacp/2011-02-15/recordset/123</a>
cacProvider	1 (xsd:integer)
site	<a href="http://health.data.gov/id/hospital/393303/site/1">http://health.data.gov/id/hospital/393303/site/1</a>
stateCode	<a href="http://reference.data.gov/id/state/PA">http://reference.data.gov/id/state/PA</a>
countyCode	<a href="http://reference.data.gov/id/state/PA/county/620">http://reference.data.gov/id/state/PA/county/620</a>
ownership	<a href="http://health.data.gov/id/hospital/ownership/type/8">http://health.data.gov/id/hospital/ownership/type/8</a>
type	<a href="http://health.data.gov/id/hospital/type/1">http://health.data.gov/id/hospital/type/1</a>
emergencyServices	1 (xsd:integer)

# [3] <http://health.data.gov/doc/hospital/393303>

## About: CHILDREN'S HOSPITAL OF PHILADELPHIA

An Entity of Type : Hospital, within Data Space : health.data.gov

Start faceted browsing from this Type

### Attributes

[rdf:type](#)

hosp:Hospital

[rdfs:label](#)

CHILDREN'S HOSPITAL OF PHILADELPHIA

[recordset](#)

<http://health.data.gov/dataset/cacp/2010-11-24/recordset/119>  
<http://health.data.gov/dataset/cacp/2011-02-25/recordset/123>  
<http://health.data.gov/dataset/cacp/2010-11-16/recordset/119>  
<http://health.data.gov/dataset/cacp/2011-02-15/recordset/123>

[cacProvider](#)

1 (xsd:integer)

[site](#)

<http://health.data.gov/id/hospital/393303/site/1>

[stateCode](#)

<http://reference.data.gov/id/state/PA>

[countyCode](#)

<http://reference.data.gov/id/state/PA/county/620>

[ownership](#)

<http://health.data.gov/id/hospital/ownership/type/8>

[type](#)

<http://health.data.gov/id/hospital/type/1>

[emergencyServices](#) 1 (xsd:integer)

The default representation for any resource is HTML (more specifically XHTML+RDFa), where data linked to and from various properties will be given.

A number of other resource representations are also available – see below.

But first, let's take a closer look at this representation – by hitting 'view source' (see next slide):

# [3] http://health.data.gov/doc/hospital/393303.html

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN" "http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" version="XHTML+RDFa 1.0">

<head>
<title>About: CHILDREN'S HOSPITAL OF PHILADELPHIA</title>
    [snip other header stuff]
</head>

<body about="http://health.data.gov/id/hospital/393303">

    [snip table-row-display-unnumbered-list-list-item stuff]

<span property="rdfs:label" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#>CHILDREN'S HOSPITAL OF PHILADELPHIA</span>
<span property="ns5:cacProvider" xmlns:ns5="http://health.data.gov/def/hospital/">1</span>(xsd:integer)</span>
<span property="ns6:emergencyServices" xmlns:ns6="http://health.data.gov/def/hospital/">1</span>(xsd:integer)</span>

    [snip]

</body>
</html>
```

# [3] http://health.data.gov/doc/hospital/393303.html

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN" "http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" version="XHTML+RDFa 1.0">

<head>
<title>About: CHILDREN'S HOSPITAL OF PHILADELPHIA</title>
    [snip other header stuff]
</head>

<body about="http://health.data.gov/id/hospital/393303">

    [snip table-row-display-unnumbered-list-list-item stuff]

    <span property="rdfs:label" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">CHILDREN'S HOSPITAL OF PHILADELPHIA</span>
    <span property="ns5:cacProvider" xmlns:ns5="http://health.data.gov/def/hospital/">1</span>(xsd:integer)</span>
    <span property="ns6:emergencyServices" xmlns:ns6="http://health.data.gov/def/hospital/">1</span>(xsd:integer)</span>

    [snip]

</body>
</html>
```

This XHTML+RDFa representation is human and machine readable!

# [3] http://health.data.gov/doc/hospital/393303.html

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN" "http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" version="XHTML+RDFa 1.0">

<head>
<title>About: CHILDREN'S HOSPITAL OF PHILADELPHIA</title>
    [snip other header stuff]
</head>

<body about="http://health.data.gov/id/hospital/393303">

    [snip table-row-display-unnumbered-list-list-item stuff]

    <span property="rdfs:label" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">CHILDREN'S HOSPITAL OF PHILADELPHIA</span>
    <span property="ns5:cacProvider" xmlns:ns5="http://health.data.gov/def/hospital/">1</span>(xsd:integer)</span>
    <span property="ns6:emergencyServices" xmlns:ns6="http://health.data.gov/def/hospital/">1</span>(xsd:integer)</span>

    [snip]

</body>
</html>
```

# [3] http://health.data.gov/doc/hospital/393303.html

```
<?xml version="1.0" encoding="utf-8"?>  
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN" "http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">  
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" version="XHTML+RDFa 1.0">
```

```
<head>  
  <title>About: CHILDREN'S HOSPITAL OF PHILADELPHIA</title>  
  [snip other header stuff]  
</head>
```



```
<body about="http://health.data.gov/id/hospital/393303">
```

```
  [snip table-row-display-unnumbered-list-list-item stuff]
```

```
<span property="rdfs:label" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#>CHILDREN'S HOSPITAL OF PHILADELPHIA</span>  
<span property="ns5:cacProvider" xmlns:ns5="http://health.data.gov/def/hospital/">1</span>(xsd:integer)</span>  
<span property="ns6:emergencyServices" xmlns:ns6="http://health.data.gov/def/hospital/">1</span>(xsd:integer)</span>
```

```
  [snip]
```

```
</body>
```

# [3] http://health.data.gov/doc/hospital/393303.html

```
<?xml version="1.0" encoding="utf-8"?>  
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN" "http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">  
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" version="XHTML+RDFa 1.0">
```

 **Markup Validation Service**  
Check the markup (HTML, XHTML, ...) of Web documents

Jump To: Congratulations · Icons

This document was successfully checked as XHTML + RDFa!

Result:	Passed
Address:	<input type="text" value="http://health.data.gov/doc/hospital/393303.html"/>
Encoding:	utf-8 <input type="button" value="Detect automatically"/>
Doctype:	XHTML + RDFa <input type="button" value="Detect automatically"/>
Root Element:	html
Root Namespace:	<a href="http://www.w3.org/1999/xhtml">http://www.w3.org/1999/xhtml</a>

The W3C validators are hosted on server technology donated by HP, and supported by community donations.  
[Donate](#) and help us build better tools for a better web.

**Options**

Show Source  Show Outline  List Messages Sequentially  Group Error Messages by Type  
 Validate error pages  Verbose Output  Clean up Markup with HTML-Tidy

[Help on the options is available.](#) [Revalidate](#)

Congratulations

# [3] http://health.data.gov/doc/hospital/393303.atom

```
<feed xmlns="http://www.w3.org/2005/Atom" xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
      xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata" xmlns:ns0pred="http://health.data.gov/def/hospital/"
      xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
  <id>http://health.data.gov/doc/hospital/393303.atom</id>
  <updated>2011-05-12T14:34:23Z</updated>
  <author>
    <name/>
  </author>
  <title type="text">OData Service and Descriptor Document</title>
  <entry>
    <id>http://health.data.gov/id/hospital/393303</id>
    <link rel="http://health.data.gov/def/hospital/site" href="http://health.data.gov/id/hospital/393303/site/1"/>
    <link rel="http://health.data.gov/def/hospital-compare/recordset" href="http://health.data.gov/dataset/cacp/2010-11-24/recordset/119"/>
    <link rel="http://www.w3.org/1999/02/22-rdf-syntax-ns#type" href="http://health.data.gov/def/hospital/Hospital"/>
    <link rel="http://health.data.gov/def/hospital/type" href="http://health.data.gov/id/hospital/type/1"/>
    <link rel="http://health.data.gov/def/hospital/ownership" href="http://health.data.gov/id/hospital/ownership/type/8"/>
    <link rel="http://health.data.gov/def/hospital-compare/recordset" href="http://health.data.gov/dataset/cacp/2011-02-25/recordset/123"/>
    <link rel="http://reference.data.gov/def/govdata/countyCode" href="http://reference.data.gov/id/state/PA/county/620"/>
    <link rel="http://reference.data.gov/def/govdata/stateCode" href="http://reference.data.gov/id/state/PA"/>
    <title>CHILDREN'S HOSPITAL OF PHILADELPHIA</title>
    <updated>2011-05-12T14:34:23Z</updated>
    <author>
      <name/>
    </author>
    <content type="application/xml">
      <m:properties>
        <ns0pred:cacProvider m:type="Edm.Int32">1</ns0pred:cacProvider>
        <ns0pred:emergencyServices m:type="Edm.Int32">1</ns0pred:emergencyServices>
        <rdfs:label>CHILDREN'S HOSPITAL OF PHILADELPHIA</rdfs:label>
      </m:properties>
    </content>
  </entry>
</feed>
```

[3] <http://health.data.gov/doc/hospital/393303.atom>

```
<feed xmlns="http://www.w3.org/2005/Atom" xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
      xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata" xmlns:ns0pred="http://health.data.gov/def/hospital/"
      xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
    <id>http://health.data.gov//doc/hospital/393303.atom</id>
```

New hoco:RecordSet(s) will accumulate over time about/around each hosp:Hospital instance, accessed at their respective feed URLs.

This will also occur for feeds of other type instances, like `void:Dataset`(s), and for lists of class instances, providing an easy way to be notified as new `comp:Measure`(s) and `comp:Metric`(s) get introduced (for example).

{Note: this last part is only partially implemented – we're still tweaking configs and queries! ☺}

```
</content>  
</entry>  
</feed>
```

```
al/393303/site/1"/>  
n/dataset/cacp/2010-11-24/recordset/119"/>  
f/hospital/Hospital"/>  
tal/type/1"/>  
/hospital/ownership/type/8"/>  
a.gov/dataset/cacp/2011-02-25/recordset/123"/>  
gov/id/state/PA/county/620"/>  
ov/id/state/PA"/>
```



# [3] /id/hospital/393303/site/1/vcard/1 as JSON

**About:** <http://health.data.gov/id/hospital/393303/site/1/vcard/1> 

An Entity of Type : [vCard Class](#), within Data Space : [health.data.gov](#)

[Start faceted browsing from this Type](#)

---

Attributes	Values
<a href="#">rdf:type</a>	<a href="#">vcard2006:VCARD</a>
<a href="#">geographic latitude</a>	39.948690
<a href="#">geographic longitude</a>	-75.192899
<a href="#">phone</a>	2155903745
<a href="#">locality</a>	PHILADELPHIA
<a href="#">postal code</a>	19104
<a href="#">street</a>	34TH ST & CIVIC CENTER BLVD
<a href="#">is siteAddress of</a>	<a href="http://health.data.gov/id/hospital/393303/site/1">http://health.data.gov/id/hospital/393303/site/1</a>

---

Alternative Linked Data Views: [SPARQL](#) | [ODE](#)   Raw Data in: [CXML](#) | [CSV](#) | [RDF \( N-Triples N3/Turtle JSON XML \)](#) | [OData \( Atom JSON \)](#)   [About](#)

# [3] /id/hospital/393303/site/1/vcard/1 as JSON

About: <http://health.data.gov/id/hospital/393303/site/1/vcard/1> 

An Entity of Type : vCard Class, within Data Space : [health.data.gov](http://health.data.gov)

Start faceted browsing from this Type

<http://health.data.gov/id/hospital/393303/site/1/vcard/1.json>

Attributes	Values
rdf:type	vcard2006:VCARD
geographic_latitude	39.948690
geographic_longitude	-75.192899
phone	2155903745
locality	PHILADELPHIA
postal_code	19104
street	34TH ST & CIVIC
is siteAddress of	<a href="http://health.data.gov/id/hospital/393303">http://health.data.gov/id/hospital/393303</a>

```
{ "d": {  
  "results": [  
    { "__metadata": { "uri": "http://health.data.gov/id/hospital/393303/site/1" },  
      "http://www.w3.org/ns/org#siteAddress": { "__deferred": { "uri": "http://health.data.gov/id/hospital/393303/site/1/vcard/1" } }  
    ], __metadata: { "uri": "http://health.data.gov/id/hospital/393303/site/1/vcard/1" },  
      "http://www.w3.org/2006/vcard/ns#locality": "PHILADELPHIA",  
      "http://www.w3.org/1999/02/22-rdf-syntax-ns#type": { "__deferred": { "uri": "http://www.w3.org/2006/vcard/ns#VCard" } },  
        "http://www.w3.org/2006/vcard/ns#latitude": "39.948690",  
        "http://www.w3.org/2006/vcard/ns#postal-code": "19104",  
        "http://www.w3.org/2006/vcard/ns#street-address": "34TH ST & CIVIC CENTER  
BLVD",  
          "http://www.w3.org/2006/vcard/ns#tel": "2155903745",  
          "http://www.w3.org/2006/vcard/ns#longitude": "-75.192899"  
        }  
    ], __count: "2"  
  } }  
}
```

Alternative Linked Data Views: [SPARQL](#) | [ODE](#)

Raw Data in: [CXML](#) | [CSV](#) | [RDF \( N-Triples N3/Turtle JSON XML \)](#) | [OData \( Atom JSON \)](#) | [About](#)

# [4] Using the /isparql Visualization Service

**About:** <http://health.data.gov/id/hospital/393303/site/1/vcard/1> 

An Entity of Type : vCard Class, within Data Space : [health.data.gov](http://health.data.gov)

[Start faceted browsing from this Type](#)

---

## Attributes      Values

rdf:type      vcard2006:VCARD

geographic.latitude      39.948690

geographic.longitude      -75.192899

phone      2155903745

locality      PHILADELPHIA

postal\_code      19104

street      34TH ST & CIVIC CENTER BLVD

is siteAddress of      <http://health.data.gov/id/hospital/393303/site/1>

Alternative Linked Data Views: [SPARQL](#) | [ODE](#)      Raw Data in: [CXML](#) | [CSV](#) | [RDF \( N-Triples N3/Turtle JSON XML \)](#) | [OData \( Atom JSON \)](#)      [About](#)



# [4] Using the /isparql Visualization Service

About: <http://health.data.gov/id/hospital/393303/site/1/vcard/1> 

An Entity of Type : vCard Class, within Data Space : [health.data.gov](http://health.data.gov)

[Start faceted browsing from this Type](#)

## Attributes

rdf:type vcard2006:VCARD

geographic.latitude 39.948690

geographic.longitude -75.192899

phone 2155903745

locality PHILADELPHIA

postal\_code 19104

street 34TH ST & CIVIC CENTER BLVD

is siteAddress of <http://health.data.gov/id/hospital/393303/site/1>

Go to any  
</id/hospital/{guid}/site/1/vcard/1>  
Then click on the 'iSPARQL' link  
And select Google Maps View:  
(see next slide)

Alternative Linked Data Views: [iSPARQL](#) | [ODE](#) Raw Data in: [CXML](#) | [CSV](#) | [RDF \( N-Triples N3/Turtle JSON XML \)](#) | [OData \( Atom JSON \)](#) | [About](#)



# [4] /isparql GMap of /hospital/393303/site/1/vcard/1

Result SPARQL Params Response Query 1(1) View: Google Maps v3

Permalink

View: Google Maps v3

Map Satellite

1

**rdf:type** <http://www.w3.org/2006/vcard/ns#VCARD>

**locality** PHILADELPHIA

**tel** 2155903745

**postal-code** 19104

**street-address** 34TH ST & CIVIC CENTER BLVD

The Children's Hospital of Philadelphia

South St

34th St

35th St

University of Pennsylvania

Annenberg Center for the Performing Arts

Stiteler Hall

Locust Walk

McNeil Bldg

Lehman Brothers Quadrangle

Wistar Institute

Stouffer College House

The Quadrangle

Hamilton Walk

Leidy Laboratories

John Morgan Bldg

Claire M. Fagin Hall

Kaskey Park

Blockley Hall

Cune Blvd

Biomedical Research Bldg II/III

The Consortium

Veteran's Administration Nursing Home

Child Guidance Clinic

Roberts Proton Therapy Center

Perelman Center for Advanced Medicine

Bower Field

Hollenback Center

Hollenback Annex

Rhodes Field

MacAlister Hall

The Left Bank

Highline Field

United S Postoff

Paley Bridge

Penn Park

Franklin Field

Penn Museum

Museum Parking Garage

University City

E Service Dr

W Sec

Civic Center Blvd

S Univ

S 34th St

S 35th St

Service Dr

34th St

76

345A

Walnut St

Walnut St

3133 Walnut Street

Class of 1923 Ice Arena

Levy Tennis Pavilion

Walnut

Ch

# [4] /isparql GMap of /hospital/393303/site/1/vcard/1

Result SPARQL Params Response Query 1(1) View: Google Maps v3

Permalink

Map Satellite

The map displays the University of Pennsylvania campus and surrounding areas. A red marker indicates the location of The Children's Hospital of Philadelphia, located at 34th Street and Civic Center Boulevard. The map also shows the Hospital of the University of Pennsylvania and other medical facilities like the Perelman Center for Advanced Medicine and the Roberts Proton Therapy Center. Major roads like Walnut Street, South Street, and 34th Street are visible, along with highways 13 and 76.

1

**rdf:type** <http://www.w3.org/2006/vcard/ns#VCARD>  
**locality** PHILADELPHIA  
**tel** 2155903745  
**postal-code** 19104  
**street-address** 34TH ST & CIVIC CENTER BLVD

## [4] http://health.data.gov/isparql - Visual Query Service

QBE Advanced Results

Graph Named Graphs (0) Clear

SPARQL Query

-- Recent Queries -- -- Prefixes -- -- Template -- -- Statement Help -- Clear

```
PREFIX hosp: <http://health.data.gov/def/hospital/>
PREFIX gd: <http://reference.data.gov/def/govdata/>
PREFIX hoco: <http://health.data.gov/def/hospital-compare/>
PREFIX comp: <http://health.data.gov/def/compare/>

select distinct ?Hospital ?Measure ?Metric ?Admissions ?Percentage
where {
?s1 a hosp:Hospital ;
rdfs:label ?Hospital ;
gd:stateCode ?s2 ;
hoco:recordset ?s3 .

filter (?s2 = <http://reference.data.gov/id/state/DC>) .

?s3 hoco:record ?Record_URI .

?Record_URI comp:measure ?s5 ;
gd:percentage ?Percentage ;
comp:metric ?Metric_URI ;
hoco:admissions ?Admissions .

filter (?s5 = <http://health.data.gov/id/measure/30>).
?s5 rdfs:comment ?Measure .

filter (?Metric_URI = <http://health.data.gov/id/metric/15>).
?Metric_URI rdfs:comment ?Metric .
}
```

## [4] http://health.data.gov/isparql - Visual Query Service

The screenshot shows the iSPARQL service interface. At the top, there are tabs for QBE, Advanced, and Results. Below the tabs is a toolbar with icons for file operations like Open, Save, and Print. A navigation bar includes Graph, Named Graphs (0), and a Clear button. The main area is titled "SPARQL Query". It contains the following SPARQL code:

```
PREFIX hosp: <http://health.data.gov/def/hospital/>
PREFIX gd: <http://reference.data.gov/def/govdata/>
PREFIX hoco: <http://health.data.gov/def/hospital-compare/>
PREFIX comp: <http://health.data.gov/def/compare/>

select distinct ?Hospital ?Measure ?Metric ?Admissions ?Percentage
where {
  ?s1 a hosp:Hospital ;
    rdfs:label ?Hospital ;
    gd:stateCode ?s2 ;
    hoco:recordset ?s3 .

  filter (?s2 = <http://reference.data.gov/id/state/DC>) .

  ?s3 hoco:record ?Record_URI .

  ?Record_URI comp:measure ?s5 ;
    gd:percentage ?Percentage ;
    comp:metric ?Metric_URI ;
    hoco:admissions ?Admissions .

  filter (?s5 = <http://health.data.gov/id/measure/30>).
  ?s5 rdfs:comment ?Measure .

  filter (?Metric_URI = <http://health.data.gov/id/metric/15>).
  ?Metric_URI rdfs:comment ?Metric .
}
```

A yellow callout bubble points from the text "This query finds a needle in the RDF haystack. It asks the iSPARQL Service to return;" to the SPARQL code.

This query finds a needle in the RDF haystack. It asks the iSPARQL Service to return;

Any Hospitals in DC that have any 30-day Readmission Rate (a specific Measure) Records where the readmission percentage is worse than the US national rate (a specific Metric).

## [4] http://health.data.gov/isparql - Visual Query Service

QBE Advanced Results

Graph Named Graphs (0) Clear

SPARQL Query

-- Recent Queries -- -- Prefixes -- -- Template -- -- Statement Help -- Clear

```
PREFIX hosp: <http://health.data.gov/def/hospital/>
PREFIX gd: <http://reference.data.gov/def/govdata/>
PREFIX hoco: <http://health.data.gov/def/hospital-compare/>
PREFIX comp: <http://health.data.gov/def/compare/>

select distinct ?Hospital ?Measure ?Metric ?Admissions ?Percentage
where {
?s1 a hosp:Hospital ;
rdfs:label ?Hospital ;
gd:stateCode ?s2 ;
hoco:recordset ?s3 .

filter (?s2 = <http://reference.data.gov/id/state/DC>) .

?s3 hoco:record ?Record_URI .

?Record_URI comp:measure ?s5 ;
gd:percentage ?Percentage ;
comp:metric ?Metric_URI ;
hoco:admissions ?Admissions .

filter (?s5 = <http://health.data.gov/id/measure/30>).
?s5 rdfs:comment ?Measure .

filter (?Metric_URI = <http://health.data.gov/id/metric/15>).
?Metric_URI rdfs:comment ?Metric .
}
```

## [4] http://health.data.gov/isparql - Visual Query Service

The screenshot shows a web-based SPARQL query editor. At the top, there are three tabs: 'QBE' (which is selected), 'Advanced', and 'Results'. Below the tabs is a toolbar with icons for file operations like Open, Save, and Print. A navigation bar includes 'Graph' and 'Named Graphs (0)'. On the right side of the interface are buttons for 'Clear', 'Recent Queries', 'Template', and 'Statement Help'. The main area contains a SPARQL query:

```
PREFIX hosp: <http://health.data.gov/def/hospital/>
PREFIX gd: <http://reference.data.gov/def/govdata/>
PREFIX hoco: <http://health.data.gov/def/hospital-compare/>
PREFIX comp: <http://health.data.gov/def/compare/>

select distinct ?Hospital ?Measure ?Metric ?Admissions ?Percentage
where {
  ?s1 a hosp:Hospital ;
    rdfs:label ?Hospital ;
    gd:stateCode ?s2 ;
    hoco:recordset ?s3 .

  filter (?s2 = <http://reference.data.gov/id/state/DC>) .

  ?s3 hoco:record ?Record_URI .

  ?Record_URI comp:measure ?s5 ;
    gd:percentage ?Percentage ;
    comp:metric ?Metric_URI ;
    hoco:admissions ?Admissions .

  filter (?s5 = <http://health.data.gov/id/measure/30>).
  ?s5 rdfs:comment ?Measure .

  filter (?Metric_URI = <http://health.data.gov/id/metric/15>).
  ?Metric_URI rdfs:comment ?Metric .
}
```

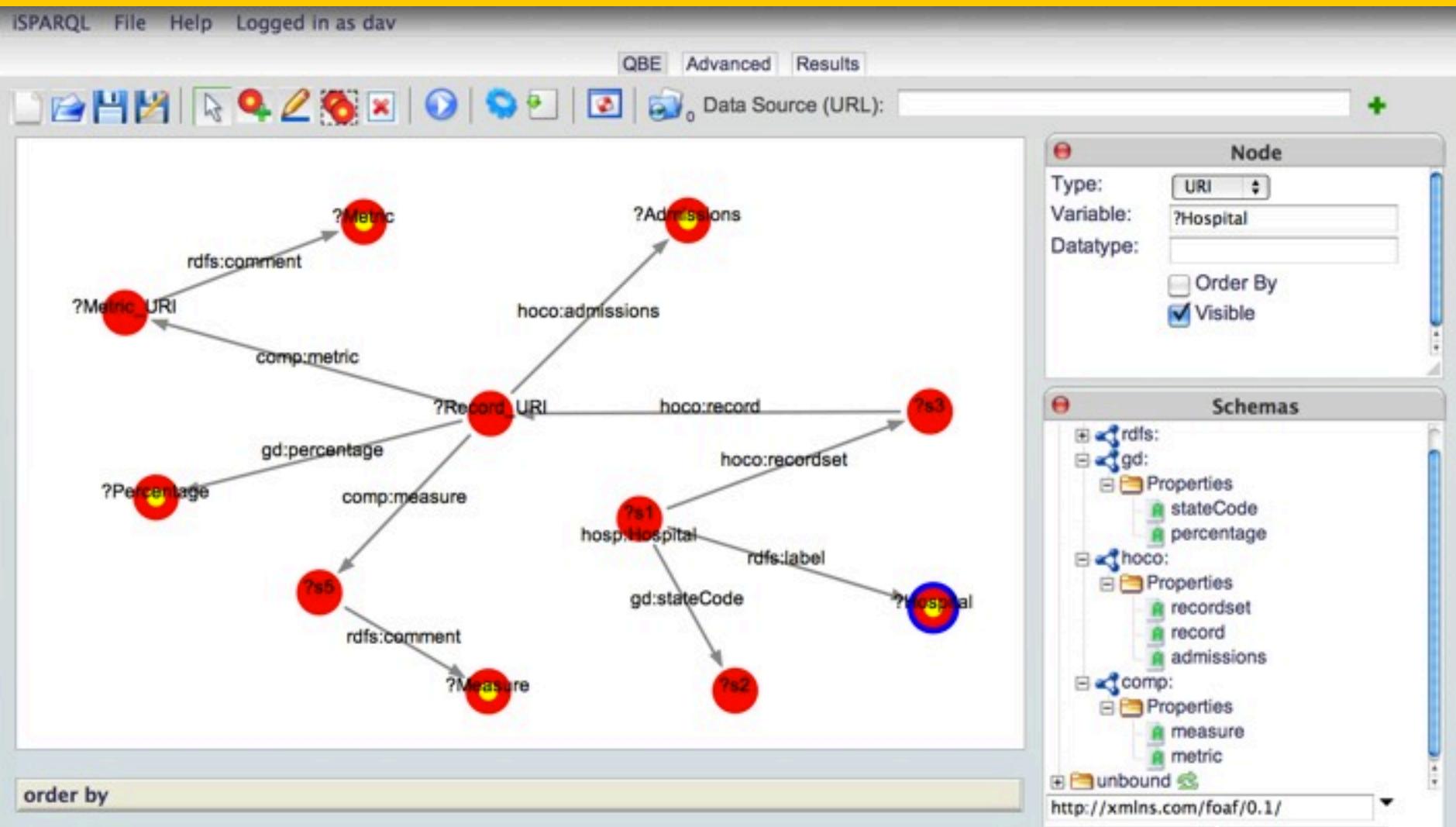
A yellow callout bubble points from the text 'Here you can enter your SPARQL query and the /isparql service will draw your graph when you select the 'QBE' tab' to the 'SPARQL Query' input area.

**Here you can enter your SPARQL query and the /isparql service will draw your graph when you select the 'QBE' tab**

- or vice versa -

You can also use the visual graph tools and /isparql will generate your SPARQL query (see next slide).

# [4] /isparql - Generating Visual and Textual Queries



# [4] /isparql - Generating Visual and Textual Queries

ISPARQL File Help Logged in as dav

QBE Advanced Results

Data Source (URL):

The interface shows a query graph on the left and configuration panels on the right.

**Query Graph:**

- Nodes: ?Metric\_URI, ?Metric, ?Record\_URI, ?Admissions, ?Percentage, ?s5, ?s6, ?Metric\_Uri, ?s1, ?s2, ?s3, ?Hospital.
- Predicates:
  - ?Metric\_URI rdfs:comment ?Metric
  - ?Metric\_URI comp:metric ?Record\_URI
  - ?Record\_URI gd:percentage ?Percentage
  - ?Record\_URI comp:measure ?s5
  - ?Percentage rdfs:comment ?Metric\_Uri
  - ?Record\_URI hoco:admissions ?Admissions
  - ?Record\_URI hoco:record ?s3
  - ?s1 hospital:hospital ?s1
  - ?s1 gd:stateCode ?s2
  - ?s2 rdfs:label ?Hospital
  - ?s1 hoco:recordset ?s3

**Node Panel (Top Right):**

- Type: URI
- Variable: ?Hospital
- Datatype:
- Order By
- Visible

**Schemas Panel (Bottom Right):**

- rdflib:
- gd:
  - Properties
    - stateCode
    - percentage
- hoco:
  - Properties
    - recordset
    - record
    - admissions
- comp:
  - Properties
    - measure
    - metric
- unbound

order by

http://xmlns.com/foaf/0.1/

# [4] /isparql - Query Response/Result in XML

Result SPARQL Params Response Query 1(1)

Execute Permalink Anchor behavior:

Hospital	Measure	Metric	Admissions	Percentage
HOWARD UNIVERSITY HOSPITAL	30-Day Readmission Rate	Worse than U.S. National Rate	250	28.9
GEORGE WASHINGTON UNIV HOSPITAL	30-Day Readmission Rate	Worse than U.S. National Rate	291	29.3

Result SPARQL Params Response Query 1(1)

```
<sparql xmlns="http://www.w3.org/2005/sparql-results#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation=""

<head>
<variable name="Hospital"/>
<variable name="Measure"/>
<variable name="Metric"/>
<variable name="Admissions"/>
<variable name="Percentage"/>
</head>
<results distinct="false" ordered="true">
<result>
<binding name="Hospital"><literal>HOWARD UNIVERSITY HOSPITAL</literal></binding>
<binding name="Measure"><literal>30-Day Readmission Rate</literal></binding>
<binding name="Metric"><literal>Worse than U.S. National Rate</literal></binding>
<binding name="Admissions"><literal datatype="http://www.w3.org/2001/XMLSchema#int">250</literal></binding>
<binding name="Percentage"><literal datatype="http://www.w3.org/2001/XMLSchema#double">28.9</literal></binding>
</result>
<result>
<binding name="Hospital"><literal>GEORGE WASHINGTON UNIV HOSPITAL</literal></binding>
<binding name="Measure"><literal>30-Day Readmission Rate</literal></binding>
<binding name="Metric"><literal>Worse than U.S. National Rate</literal></binding>
<binding name="Admissions"><literal datatype="http://www.w3.org/2001/XMLSchema#int">291</literal></binding>
<binding name="Percentage"><literal datatype="http://www.w3.org/2001/XMLSchema#double">29.3</literal></binding>
</result>
</results>
</sparql>
```

# [5] /facet Search – Keyword Text



Text Search    URI Lookup (by Label)    **URI Lookup**    Featured | Demo Queries | About

### Precision Search & Find

Search Text

Hint: You can add this engine in search bar of an OpenSearch - capable browser

Faceted Search & Find service



OpenLink Virtuoso version 06.01.3127, on Linux (x86\_64-unknown-linux-gnu), Standard Edition

Copyright © 2009-2011 OpenLink Software

# [5] /facet Search – Keyword Text



A screenshot of a web-based search interface titled 'Precision Search &amp; Find'. At the top, there are three tabs: 'Text Search' (which is highlighted with a yellow border), 'URI Lookup (by Label)', and 'URI Lookup'. To the right of the tabs are links for 'Featured', 'Demo Queries', and 'About'. Below the tabs, there is a search form with a 'Search Text' input field containing the word 'hospital' and a 'Search' button. A yellow callout bubble originates from the 'Text Search' tab and points to the explanatory text below.

Use the Faceted Search service at  
<http://health.data.gov/facet>  
for executing normal keyword  
searches, such as the search for  
keyword '**hospital**' shown here.

# [5] /facet Search – Keyword Results



Displaying Ranked Entity Names and Text summaries where:

Entity has any Attribute with Value "hospital" Drop.

[View query as SPARQL](#)

Showing 1-20 of 3069 total [Next](#)

- hosp:Hospital Hospital
- [http://health.data.gov/id/hospital/360002](#) SAMARITAN HOSPITAL - PEOPLES HOSPITAL
- [http://health.data.gov/id/footnote/2](#) 2
- [http://health.data.gov/id/hospital/431318](#) BOWDLE HOSPITAL - CRITICAL ACCESS HOSPITAL
- [http://health.data.gov/id/hospital/351309](#) UNION HOSPITAL MERITCARE MAYVILLE HOSPITAL AND CL
- [http://health.data.gov/al/ownership/type/2](#) Government - Hospital District or Authority
- [http://health.data.gov/id/measure/56](#) h\_quiet\_hsp

SAMARITAN **HOSPITAL** PEOPLES  
**HOSPITAL** PEOPLES **HOSPITAL** PEOPLES...  
**HOSPITAL** PEOPLES **HOSPITAL** PEOPLES  
**HOSPITAL** PEOPLES **HOSPITAL**.

The **hospital** indicated that the data submitted for this measure were based on a sample of cases. he **hospital** indicated that the data submitted for this measure were based on a sample of cases. he **hospital** indicated that the data submitted for this...

BOWDLE **HOSPITAL** CRITICAL ACCESS  
**HOSPITAL** CRITICAL ACCESS **HOSPITAL**.  
UNION **HOSPITAL** MERITCARE MAYVILLE  
**HOSPITAL** AND CL

Government **Hospital** District or  
AuthorityGovernment **Hospital** District or  
AuthorityGovernment... District or  
AuthorityGovernment **Hospital** District or  
AuthorityGovernment **Hospital** District or...  
**Hospital** District or Authority.

Quietness of **Hospital** Environment Quietness of  
**Hospital** Environment Quietness of **Hospital**...  
of **Hospital** Environment Quietness of **Hospital** Environment Quietness of **Hospital**... of  
**Hospital** Environment.

Cleanliness of **Hospital** Environment Cleanliness  
of **Hospital** Environment Cleanliness of

## Entity Relations Navigation

Types  
Attributes  
Referencing Attributes  
Places  ▼

Options  
Save  
Featured Queries  
New Search

# [5] /facet Search – Keyword Results

The screenshot shows a search interface for the OpenLink Virtuoso triple store. The top navigation bar includes the OpenLink Software logo and a 'POWERED BY VIRTUOSO' badge. The main content area displays a list of search results for the keyword 'hospital'. A yellow callout box highlights the first result, which is the highest ranked match.

**Displaying Ranked Entity Names and Text summaries where:**  
Entity has any Attribute with Value "hospital" Drop.

[View query as SPARQL](#)

**Entity Relations Navigation**  
Types  
Attributes  
Referencing Attributes  
Places

**Options**  
Save  
Featured Queries  
New Search

**Results:**

- hosp:Hospital
- <http://health.data.gov/id/hospital/360002> SAMARITAN HOSPITAL - PEOPLES H
- <http://health.data.gov/id/footnote/2> 2
- <http://health.data.gov/id/hospital/431318> BOWDLE HOSPITAL - CRITICAL AC HOSPITAL
- <http://health.data.gov/id/hospital/351309> UNION HOSPITAL MERITCARE MAY HOSPITAL AND CL
- <http://health.data.gov/al/ownership/type/2> Government - Hospital District or Authority
- <http://health.data.gov/id/measure/56> h\_quiet\_hsp

The highlighted result, 'hosp:Hospital', is described in the callout box:

The highest ranked match for keyword 'hospital' is the URI for the Hospital class in the hospital vocabulary – [hosp:Hospital](#)

When you click that link, you land on a page about the [hosp:Hospital](#) class, see next slide...

AuthorityGovernment **Hospital** District or AuthorityGovernment **Hospital** District or... **Hospital** District or Authority.

Quietness of **Hospital** EnvironmentQuietness of **Hospital** EnvironmentQuietness of **Hospital**... of **Hospital** EnvironmentQuietness of **Hospital** EnvironmentQuietness of **Hospital**... of **Hospital** Environment.

Cleanliness of **Hospital** EnvironmentCleanliness of **Hospital** EnvironmentCleanliness of

# [5] /facet Search – from Keyword Text to Structured Data

[Description](#)[Usage Statistics](#)[Settings](#)

## About: Hospital

An Entity of Type : Class, within Data Space : [health.data.gov](#)

[Start faceted browsing from this Type](#)

### Attributes    Values

`rdf:type`    [rdfs:Class](#)

`rdfs:label`    Hospital

`rdfs:isDefinedBy` <http://health.data.gov/def/hospital/>

`rdfs:subClassOf` [rdfs:Resource](#)

`disjointWith`    [gd:Country](#)  
[hoco:Record](#)  
[hoco:RecordSet](#)  
[gd:State](#)  
<http://www.w3.org/ns/org#Organization>

`is rdf:type of`    <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[\[more\]](#)

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SPARQL



RDF



OPEN DATA



BY-SA



## [5] /facet Search – from Keyword Text to Structured Data

[Description](#)[Usage Statistics](#)[Settings](#)

### About: Hospital

An Entity of Type : Class, within Data Space : [health.data.gov](#)

Start faceted browsing from this Type

#### Attributes

[rdf:type](#) rdfs:Class

[rdfs:label](#) Hospital

[rdfs:isDefinedBy](#) <http://health.data.gov/def/hospital/>

[rdfs:subClassOf](#) rdfs:Resource

[disjointWith](#) gd:Country  
hoco:Record  
hoco:RecordSet  
gd:State  
<http://www.w3.org/ns/org#Organization>

[is rdf:type of](#) <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[+more»](#)

This page tells you that hosp:Hospital is a (rdf:type) rdfs:Class ...

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## [5] /facet Search – from Keyword Text to Structured Data

[Description](#)[Usage Statistics](#)[Settings](#)

### About: Hospital

An Entity of Type : Class, within Data Space : [health.data.gov](#)

Start faceted browsing from this Type

#### Attributes

[rdf:type](#) rdfs:Class

[rdfs:label](#) Hospital

[rdfs:isDefinedBy](#) <http://health.data.gov/def/hospital/>

[rdfs:subClassOf](#) rdfs:Resource

[disjointWith](#) gd:Country  
hoco:Record  
hoco:RecordSet  
gd:State  
<http://www.w3.org/ns/org#Organization>

[is rdf:type of](#) <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[+more»](#)

This page tells you that hosp:Hospital is a (rdf:type) rdfs:Class ...

...and which RDFS Vocabulary this class is defined by...

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## [5] /facet Search – from Keyword Text to Structured Data

[Description](#)[Usage Statistics](#)[Settings](#)

### About: Hospital

An Entity of Type : Class, within Data Space : [health.data.gov](#)

Start faceted browsing from this Type

#### Attributes

[rdf:type](#) [rdfs:Class](#)

[rdfs:label](#) Hospital

[rdfs:isDefinedBy](#) <http://health.data.gov/def/hospital/>

[rdfs:subClassOf](#) [rdfs:Resource](#)

[disjointWith](#) [gd:Country](#)

[hoco:Record](#)

[hoco:RecordSet](#)

[gd:State](#)

[http://www.w3.org/ns/org#Organization](#)

[is rdf:type of](#)

[http://health.data.gov/id/hospital/393303](#)

[http://health.data.gov/id/hospital/063301](#)

[http://health.data.gov/id/hospital/053302](#)

[http://health.data.gov/id/hospital/093300](#)

[http://health.data.gov/id/hospital/393302](#)

[...more»](#)

This page tells you that hosp:Hospital is a (rdf:type) rdfs:Class ...

...and which RDFS Vocabulary this class is defined by...

...and also provides a list of all the instances of this class that you can page through or click through to.

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# [5] /facet Search – from Metadata Labels



Text Search      **URI Lookup (by Label)**      URI Lookup      Featured | Demo Queries | About

## Precision Search & Find

**Label:** Hospital

**Hint:** Hospital Characteristics  
(HOSP) <http://health.data.gov/dataset/hosp/2010-11-24>

**OpenLink Virtuo:**

- Hospital <http://health.data.gov/def/hospital/Hospital>
- hospital <http://health.data.gov/def/hospital/>
- Hospital Characteristics  
(HOSP) <http://health.data.gov/dataset/hosp/2010-11-24>
- Hospital Characteristics  
(HOSP) <http://health.data.gov/dataset/hosp/2011-02-25>
- Hospital Characteristics  
(HOSP) <http://health.data.gov/dataset/hosp>
- Hospital Compare  
Vocabulary <http://health.data.gov/def/hospital-compare/>
- Hospital Consumer Assessment of Healthcare Providers and Systems - National  
(HN) <http://health.data.gov/dataset/hn/2010-11-24>
- Hospital Consumer Assessment of Healthcare Providers and Systems - National  
(HN) <http://health.data.gov/dataset/hn/2011-02-25>
- Hospital Consumer Assessment of Healthcare Providers and Systems - Providers  
(HP) <http://health.data.gov/dataset/hp/2010-11-24>
- Hospital Consumer Assessment of Healthcare Providers and Systems - Providers  
(HP) <http://health.data.gov/dataset/hp/2011-02-25>
- Hospital Consumer Assessment of Healthcare Providers and Systems - State  
(HS) <http://health.data.gov/dataset/hs/2010-11-24>
- Hospital Consumer Assessment of Healthcare Providers and Systems - State  
(HS) <http://health.data.gov/dataset/hs/2011-02-25>

# [5] /facet Search – from Metadata Labels



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The screenshot shows a web-based search interface for 'Precision Search & Find'. At the top, there are three tabs: 'Text Search', 'URI Lookup (by Label)', and 'URI Lookup'. The 'URI Lookup (by Label)' tab is highlighted with a yellow border. Below the tabs, the text 'Precision Search & Find' is displayed. A search input field labeled 'Label' contains the text 'Hospital'. To the right of the input field is a 'Describe' button. A dropdown menu is open, listing several URIs and their labels. The first item in the list is highlighted with a blue background: 'Hospital http://health.data.gov/def/hospital/Hospital'. Other items in the list include 'hospital http://health.data.gov/def/hospital/' and 'Hospital Characteristics (HOSP) http://health.data.gov/dataset/hosp/2010-11-24'. The background of the page is light blue, and the overall layout is clean and modern.

You can also use the Faceted Search service at  
<http://health.data.gov/facet>

for executing `rdfs:label` searches, such as the search for label ‘Hospital’ shown here, which displays instant results, showing on the left the matching `rdfs:label` of the `hosp:Hospital` class, followed by anything else having the string ‘Hospital’ in its `rdfs:label`. Selecting the highlighted suggestion takes you to the next slide...

# [5] /facet Search – to Metadata Classes

[Description](#)[Usage Statistics](#)[Settings](#)

## About: Hospital



An Entity of Type : Class, within Data Space : [health.data.gov](#)

[Start faceted browsing from this Type](#)

### Attributes    Values

`rdf:type`    [rdfs:Class](#)

`rdfs:label`    Hospital

`rdfs:isDefinedBy` <http://health.data.gov/def/hospital/>

`rdfs:subClassOf` [rdfs:Resource](#)

`disjointWith`    [gd:Country](#)  
[hoco:Record](#)  
[hoco:RecordSet](#)  
[gd:State](#)  
<http://www.w3.org/ns/org#Organization>

`is rdf:type of`    <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[+more»](#)

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# [5] /facet Search – to Metadata Classes



POWERED BY  
VIRTUOSO

Description

Usage Statistics

Settings

## About: Hospital



An Entity of Type : Class, within Data Space : [health.data.gov](#)

Start faceted browsing from this Type

### Attributes    Values

rdf:type    rdfs:Class

rdfs:label    Hospital

rdfs:isDefinedBy <http://health.data.gov/def/hospital/>

rdfs:subClassOf rdfs:Resource

disjointWith    gd:Country  
hoco:Record  
hoco:RecordSet  
gd:State  
<http://www.w3.org/ns/org#Organization>

is rdf:type of    <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[...more»](#)

And we're back on the page about the hosp:Hospital class as expected...

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# [5] /facet Search – URI Lookup



Text Search    URI Lookup (by Label)    **URI Lookup**    Featured | Demo Queries | About

### Precision Search & Find

URI  Describe

[http://health.data.gov/def/hospital/Hospital](#) [http://health.data.gov/def/hospital/HospitalOwnershipType](#)

Hint: You can add this engine in search bar of an OpenSearch - capable browser

Faceted Search & Find service  
POWERED BY    
OpenLink Virtuoso version 06.01.3127, on Linux (x86\_64-unknown-linux-gnu), Standard Edition  
Copyright © 2009-2011 OpenLink Software

# [5] /facet Search – URI Lookup



The screenshot shows a web interface for a search service. At the top, there are three tabs: "Text Search", "URI Lookup (by Label)", and "URI Lookup". The "URI Lookup" tab is highlighted with a yellow box. Below the tabs, the title "Precision Search & Find" is displayed. A search bar labeled "URI" contains the text "http://health.data.gov/def/hospital/". To the right of the search bar is a "Describe" button. Below the search bar, a dropdown menu displays suggestions: "http://health.data.gov/def/hospital/Hospital" and "http://health.data.gov/def/hospital/HospitalOwnershipType".

Lastly, you can also use the Faceted Search service at  
<http://health.data.gov/facet>

for executing **URI Lookup** searches, such as the search for <http://health.data.gov/def/hospital/> shown here, which also displays instant results, beginning with the class Hospital which is specified in that vocabulary, followed by other entities in that vocab. Selecting the highlighted suggestion takes you once again to...

# [6] /facet Browsing – Interactive Query Builder

[Description](#)[Usage Statistics](#)[Settings](#)

## About: Hospital

An Entity of Type : Class, within Data Space : [health.data.gov](#)

[Start faceted browsing from this Type](#)

### Attributes    Values

`rdf:type`    [rdfs:Class](#)

`rdfs:label`    Hospital

`rdfs:isDefinedBy` <http://health.data.gov/def/hospital/>

`rdfs:subClassOf` [rdfs:Resource](#)

`disjointWith`    [gd:Country](#)  
[hoco:Record](#)  
[hoco:RecordSet](#)  
[gd:State](#)  
<http://www.w3.org/ns/org#Organization>

`is rdf:type of`    <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[+more»](#)

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# [6] /facet Browsing – Interactive Query Builder



POWERED BY  
VIRTUOSO

Description

Usage Statistics

Settings

## About: Hospital



An Entity of Type : Class, within Data Space : [health.data.gov](#)

[Start faceted browsing from this Type](#)

### Attributes    Values

`rdf:type`    [rdfs:Class](#)

`rdfs:label`    Hospital

`rdfs:isDefinedBy` <http://health.data.gov/def/hospital/>

`rdfs:subClassOf` [rdfs:Resource](#)

`disjointWith`    [gd:Country](#)  
[hoco:Record](#)  
[hoco:RecordSet](#)  
[gd:State](#)  
<http://www.w3.org/ns/org#Organization>

`is rdf:type of`    <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[...more»](#)

The hosp:Hospital class page. From here, you can ‘follow your nose’ and traverse the graph by dereferencing links on this page, which is fundamentally the most basic form of ‘faceted browsing’.

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# [6] /facet Browsing – Interactive Query Builder

[Description](#)[Usage Statistics](#)[Settings](#)

## About: Hospital

An Entity of Type: Class, within Data Space : health.data.gov  
Start faceted browsing from this Type

### Attributes

rdf:type rdfs:Class

rdfs:label Hospital

rdfs:isDefinedBy <http://health.data.gov/def/hospital/>

rdfs:subClassOf rdfs:Resource

disjointWith gd:Country  
hoco:Record  
hoco:RecordSet  
gd:State  
<http://www.w3.org/ns/org#Organization>

is rdf:type of <http://health.data.gov/id/hospital/393303>  
<http://health.data.gov/id/hospital/063301>  
<http://health.data.gov/id/hospital/053302>  
<http://health.data.gov/id/hospital/093300>  
<http://health.data.gov/id/hospital/393302>  
[more...](#)

This time, let's try something new and click on the '**Start faceted browsing from this Type**' link

The hosp:Hospital class page. From here, you can 'follow your nose' and traverse the graph by dereferencing links on this page, which is fundamentally the most basic form of '**faceted browsing**'.

[First](#)[Prev](#)[Next](#)[Last](#)

Page 1 of 48

1

[Go](#)Alternative Linked Data Views: [SPARQL](#) | [ODE](#)Raw Data In: [CXML](#) | [CSV](#) | [RDF](#) ( [N-Triples](#) [N3/Turtle](#) [JSON XML](#) ) | [OData](#) ( [Atom](#) [JSON](#) ) | [About](#)

# [6] /facet Browsing – All Instances of hosp:Hospital



## List of el where:

Entity1 is a **hosp:Hospital**. Drop

[View query as SPARQL](#)

Showing 1-20 of 470 total [» Next](#)

Describe CHILDREN'S HOSPITAL OF PHILADELPHIA  
Describe CHILDRENS HOSPITAL ASSOCIATION THE  
Describe CHILDRENS HOSP OF LOS ANGELES  
Describe CHILDREN'S HOSPITAL NMC  
Describe CHILDREN'S HOSPITAL OF PITTSBURGH OF UPMC  
Describe CHILDREN'S HOSPITAL BOSTON  
Describe ARKANSAS CHILDREN'S HOSPITAL  
Describe MILLER CHILDREN'S HOSPITAL  
Describe UNIV OF S AL CHILDREN'S & WOMEN'S HOS  
Describe CHILDREN'S HOSPITAL OF MICHIGAN  
Describe CHILDRENS MERCY HOSPITAL  
Describe LUCILE SALTER PACKARD CHILDREN'S HSP AT STANFORD  
Describe COOK FT WORTH CHILDRENS MEDICAL CENTER  
Describe DRISCOLL CHILDRENS HOSPITAL  
Describe SEATTLE CHILDREN'S HOSPITAL  
Describe PHOENIX CHILDREN'S HOSPITAL  
Describe CHILDREN'S HOSPITAL & MEDICAL CENTER  
Describe PRIMARY CHILDRENS MEDICAL CENTER  
Describe CONNECTICUT CHILDRENS MEDICAL CENTER  
Describe CHILDREN'S HOSPITALS & CLINICS/MPLS

## Entity Relations Navigation

Text  [Set](#)  
Types  
Attributes  
Referencing Attributes  
Distinct values (Aggregated)  
Places  [▼](#)  
Options  
Save  
Featured Queries  
New Search

Showing 1-20 of 470 total [» Next](#)

# [6] /facet Browsing – All Instances of hosp:Hospital

The results on the bottom left match this triple:  
(any) Entity1 (that) is a (rdf:type) hosp:Hospital

**OPENLINK SOFTWARE**

List of el where:  
Entity1 is a **hosp:Hospital**. D...

[View query as SPARQL](#)

Showing 1-20 of 470 / total [» Next](#)

Describe CHILDREN'S HOSPITAL OF PHILADELPHIA  
Describe CHILDRENS HOSPITAL ASSOCIATION THE  
Describe CHILDRENS HOSP OF LOS ANGELES  
Describe CHILDREN'S HOSPITAL NMC  
Describe CHILDREN'S HOSPITAL OF PITTSBURGH OF UPMC  
Describe CHILDREN'S HOSPITAL BOSTON  
Describe ARKANSAS CHILDREN'S HOSPITAL  
Describe MILLER CHILDREN'S HOSPITAL  
Describe UNIV OF S AL CHILDREN'S & WOMEN'S HOS  
Describe CHILDREN'S HOSPITAL OF MICHIGAN  
Describe CHILDRENS MERCY HOSPITAL  
Describe LUCILE SALTER PACKARD CHILDREN'S HSP AT STANFORD  
Describe COOK FT WORTH CHILDRENS MEDICAL CENTER  
Describe DRISCOLL CHILDRENS HOSPITAL  
Describe SEATTLE CHILDREN'S HOSPITAL  
Describe PHOENIX CHILDREN'S HOSPITAL  
Describe CHILDREN'S HOSPITAL & MEDICAL CENTER  
Describe PRIMARY CHILDRENS MEDICAL CENTER  
Describe CONNECTICUT CHILDRENS MEDICAL CENTER  
Describe CHILDREN'S HOSPITALS & CLINICS/MPLS

**Entity Relations Navigation**

Text  Set  
Types  
Attributes  
Referencing Attributes  
Distinct values (Aggregated)  
Places  Options  
Save  
Featured Queries  
New Search

Showing 1-20 of 470 / total [» Next](#)

Complete result - 4701 processed in 411 msec.

# [6] /facet Browsing – All Instances of hosp:Hospital

The screenshot shows a facet browser interface. At the top left is the OpenLink Software logo. Below it, a search bar contains the query "List of el where: Entity1 is a hosp:Hospital .". A yellow callout box points from the text "The results on the bottom left match this triple:" to this search bar. The main area displays a list of entity names, each preceded by a "Describe" link. The list includes: CHILDREN'S HOSPITAL OF PHILADELPHIA, CHILDRENS HOSPITAL ASSOCIATION THE, CHILDRENS HOSP OF LOS ANGELES, CHILDREN'S HOSPITAL NMC, CHILDREN'S HOSPITAL OF PITTSBURGH OF UPMC, CHILDREN'S HOSPITAL BOSTON, ARKANSAS CHILDREN'S HOSPITAL, MILLER CHILDREN'S HOSPITAL, UNIV OF S AL CHILDREN'S & WOMEN'S HOS, CHILDREN'S HOSPITAL OF MICHIGAN, CHILDRENS MERCY HOSPITAL, LUCILE SALTER PACKARD CHILDREN'S HSP AT STANFORD, COOK FT WORTH CHILDRENS MEDICAL CENTER, DRISCOLL CHILDRENS HOSPITAL, SEATTLE CHILDREN'S HOSPITAL, PHOENIX CHILDREN'S HOSPITAL, CHILDREN'S HOSPITAL & MEDICAL CENTER, PRIMARY CHILDRENS MEDICAL CENTER, CONNECTICUT CHILDRENS MEDICAL CENTER, and CHILDREN'S HOSPITALS & CLINICS/MPLS. Above the list, a message says "View query as SPARQL". To the right, a navigation panel titled "Entity Relations Navigation" has dropdown menus for "Text", "Types", "Attributes", and "Relationship Attributes (Aggregated)". A yellow callout box points from the text "Now, under the Entity Relations Navigation area on the right;" to this panel. Another yellow callout box points from the text "Step 1. click on Attributes" to the "Attributes" menu item in the navigation panel. A large yellow callout box at the bottom right points from the text "to see what properties (arcs) are connected to Entity1 instances (nodes), which will find anything that links to the class hosp:Hospital" to the "Attributes" menu item.

The results on the bottom left match this triple:  
(any) Entity1 (that) is a (rdf:type) hosp:Hospital

View query as SPARQL

Showing 1-20 of 4701 total [Next](#)

Entity Relations Navigation

Text  Set

Types

Attributes

Relationship Attributes (Aggregated)

Now, under the Entity Relations Navigation area on the right;

Step 1. click on Attributes

to see what properties (arcs) are connected to Entity1 instances (nodes), which will find anything that links to the class hosp:Hospital

# [6] /facet Browsing – hosp:Hospital Arcs



Displaying Attributes of Entities where:

Entity1 is a **hosp:Hospital**. Drop

[View query as SPARQL](#)

Showing 1-11 of 11 total

## Attribute

Describe	<input checked="" type="checkbox"/> recordset
Describe	<input checked="" type="checkbox"/> rdf:type
Describe	<input checked="" type="checkbox"/> rdfs:label
Describe	<input checked="" type="checkbox"/> site
Describe	<input checked="" type="checkbox"/> stateCode
Describe	<input checked="" type="checkbox"/> countyCode
Describe	<input checked="" type="checkbox"/> ownership
Describe	<input checked="" type="checkbox"/> type
Describe	<input checked="" type="checkbox"/> emergencyServices
Describe	<input checked="" type="checkbox"/> mpvProvider
Describe	<input checked="" type="checkbox"/> cacProvider

## Count

2887533
988563
355581
355581
355581
355581
355581
355581
355581
904
240

## Entity Relations Navigation

Text  Set

Types  
Referencing Attributes  
Distinct values (Aggregated)  
Show Matching Values

Places

Options  
Save  
Featured Queries  
New Search

Showing 1-11 of 11 total

Complete result - 11 processed in 5404 msec.

Resource utilization: 661.5KR rnd 5.584MR seq 0P disk 0B / 0 messages

Faceted Search & Find service



OpenLink Virtuoso version 06.01.3127, on Linux (x86\_64-unknown-linux-gnu), Standard Edition

# [6] /facet Browsing – hosp:Hospital Arcs



Displaying Attributes of Entities where:

Entity1 is a **hosp:Hospital**. Drop

[View query as SPARQL](#)

## Attribute

- Describe  recordset
- Describe  rdf:type
- Describe  rdfs:label
- Describe  site
- Describe  stateCode
- Describe  countyCode
- Describe  ownership
- Describe  type
- Describe  emergencyServices
- Describe  mpvProvider
- Describe  cacProvider

Step 2. Select the rdfs:label link to add another triple to the graph matching pattern at the top left.

Step 3. ‘Refocus’ your node by clicking on Entity1 (top left) again, and then select Attribute again top right, returning to this screen.

Step 4. Select the mpvProvider arc to add yet another triple to the pattern at the top left.

You’re building a simple SPARQL query, which so far should start to look like the next slide...

Complete result - 11 processed in 5404 msec.

Resource utilization: 661.5KR rnd 5.584MR seq 0P disk 0B / 0 messages

Faceted Search & Find service



OpenLink Virtuoso version 06.01.3127, on Linux (x86\_64-unknown-linux-gnu), Standard Edition

# [6] /facet Browsing – Filtering Property Values



## List of el where:

Entity1 is a **hosp:Hospital** . Drop  
Entity1 **rdfs:label** Entity2 . Drop Entity2  
Entity1 **hosp:mpvProvider** Entity3 . Drop Entity3 Entity3 = 1 . Drop

[Focus on Entity1](#)

[View query as SPARQL](#)

Showing 1-20 of 43 total [» Next](#)

[Describe BONNER GENERAL HOSPITAL](#)  
[Describe NORTH GENERAL HOSPITAL](#)  
[Describe CHEBOYGAN MEMORIAL HOSPITAL](#)  
[Describe MARK TWAIN ST JOSEPH'S HOSPITAL](#)  
[Describe PIONEER HEALTH SERVICES OF NEWTON](#)  
[Describe EDMOND MEDICAL CENTER](#)  
[Describe SHELBY REGIONAL MEDICAL CENTER](#)  
[Describe CENTRAL VIRGINIA TRAINING CENTER](#)  
[Describe ST JOHN NORTH SHORES HOSPITAL](#)  
[Describe HENRY FORD COTTAGE HOSPITAL](#)  
[Describe JAMES LAWRENCE KERNAN HOSPITAL INC](#)  
[Describe FLORIDA STATE HOSPITAL UNIT 31 MED](#)  
[Describe HASKELL COUNTY HEALTHCARE SYSTEM](#)  
[Describe BAPTIST HOSPITAL WEST](#)  
[Describe FISHERMEN'S HOSPITAL](#)  
[Describe LBJ TROPICAL MEDICAL CENTER](#)  
[Describe UNIVERSITY OF TEXAS M D ANDERSON CANCER CENTER,THE](#)  
[Describe HOSPITAL OF THE FOX CHASE CANCER CENTER](#)  
[Describe LANTERMAN DEVELOPMENTAL CENTER](#)  
[Describe WINNEBAGO IHS HOSPITAL](#)

## Entity Relations Navigation

[Set](#)

[Types](#)  
[Attributes](#)  
[Referencing Attributes](#)  
[Distinct values \(Aggregated\)](#)

[Places](#)

[Options](#)  
[Save](#)  
[Featured Queries](#)  
[New Search](#)

# [6] /facet Browsing – Filtering Property Values



List of el where:

Entity1 is a **hosp:Hospital** . Drop  
Entity1 **rdfs:label** Entity2 . Drop Entity2  
Entity1 **hosp:mpvProvider** Entity3 . Drop Entity3 Entity3 = 1 . Drop

[View query as SPARQL](#)

Describe BONNER GENERAL HOSPITAL  
Describe NORTH GENERAL HOSPITAL  
Describe CHEBOYGAN MEMORIAL HOSPITAL  
Describe MARK TWAIN ST JOSEPH'S HOSPITAL  
Describe PIONEER HEALTH SERVICES OF NEWTON  
Describe EDMOND MEDICAL CENTER  
Describe SHELBY REGIONAL MEDICAL CENTER  
Describe CENTRAL VIRGINIA TRAINING CENTER  
Describe ST JOHN NORTH SHORES HOSPITAL  
Describe HENRY FORD COTTAGE HOSPITAL  
Describe JAMES LAWRENCE KERNAN HOSPITAL INC  
Describe FLORIDA STATE HOSPITAL UNIT 31 MED  
Describe HASKELL COUNTY HEALTHCARE SYSTEM  
Describe BAPTIST HOSPITAL WEST  
Describe FISHERMEN'S HOSPITAL  
Describe LBJ TROPICAL MEDICAL CENTER  
Describe UNIVERSITY OF TEXAS M D ANDERSON CANCER CENTER,THE  
Describe HOSPITAL OF THE FOX CHASE CANCER CENTER  
Describe LANTERMAN DEVELOPMENTAL CENTER  
Describe WINNEBAGO IHS HOSPITAL

Step 5. Click on Entity3, which is the object of the triple with subject Entity1 and predicate hosp:mpvProvider to focus it, then select the value '1' from the left, to assert that the object (node) of the hosp:mpvProvider property (arc) must have value '1', and your screen should look as it does here.

The list at the bottom left now displays only the names of hospitals that provide Medicare payment and volume info.

# [6] /facet Browsing – adding Property/Values



## Displaying Attributes of Entities where:

Entity1 is a **hosp:Hospital** . Drop

Entity1 **rdfs:label** Entity2 . Drop Entity2

Entity1 **hosp:mpvProvider** Entity3 . Drop Entity3 Entity3 = 1 . Drop

Entity1 **gd:stateCode** Entity4 . Drop Entity4 Entity4 = <<http://reference.data.gov/id/state/CA>> . Drop

Entity1 **hoco:recordset** Entity5 . Drop Entity5

[View query as SPARQL](#)

Showing 1-2 of 2 total

Attribute	Count
Describe <input checked="" type="checkbox"/> record	14000
Describe <input checked="" type="checkbox"/> rdf:type <a href="http://health.data.gov/def/hospital-compare/record">http://health.data.gov/def/hospital-compare/record</a>	7280

Showing 1-2 of 2 total

Complete result - 2 processed in 375 msec.

Resource utilization: 14.48KR rnd 14.44KR seq 0P disk 0B / 0 messages

## Entity Relations Navigation

Text

Types  
 Referencing Attributes  
 Distinct values (Aggregated)  
 Show Matching Values

Places

Options  
 Save  
 Featured Queries  
 New Search

Faceted Search & Find service



OpenLink Virtuoso version 06.01.3127, on Linux (x86\_64-unknown-linux-gnu), Standard Edition

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# [6] /facet Browsing – adding Property/Values



Displaying Attributes of Entities where:

Entity1 is a **hosp:Hospital** . Drop

Entity1 **rdfs:label** Entity2 . Drop Entity2

Entity1 **hosp:mpvProvider** Entity3 . Drop Entity3 Entity3 = 1 . Drop

Entity1 **gd:stateCode** Entity4 . Drop Entity4 Entity4 = <http://reference.data.gov/id/state/CA> . Drop

Entity1 **hoco:recordset** Entity5 . Drop Entity5

[View query as SPARQL](#)

**Attribute**

Describe  record

Describe  rdf:type <http://health/>

Complete result - 2 process  
Resource utilization: 14.48%

Step 6. Refocus (by clicking on) Entity1 again, and select Attributes from the right again, this time selecting the gd:stateCode property.

Step 7. Focus Entity4 and assign it's value to be 'CA' for California, by selecting the first State in the new bottom left list .

Step 8. Focus Entity1 again, select Attributes again, and this time select the hoco:recordset property

Step. 9 Focus Entity5, select Attributes, and select the record property

And your screen should look as it does in the next slide...

# [6] /facet Browsing – Bookmark Your Query



where:

Entity1 is a **hosp:Hospital** . Drop

Entity1 **rdfs:label** Entity2 . Drop Entity2

Entity1 **hosp:mpvProvider** Entity3 . Drop Entity3 Entity3 = 1 . Drop

Entity1 **gd:stateCode** Entity4 . Drop Entity4 Entity4 = <http://reference.data.gov/id/state/CA> . Drop

Entity1 **hoco:recordset** Entity5 . Drop Entity5 Entity5 **hoco:record** Entity6 . Drop Entity6

[View query as SPARQL](#)

Showing 1-20 of 137 total [» Next](#)

<http://health.data.g...dset/16739/record/1>  
<http://health.data.g...dset/16735/record/1>  
<http://health.data.g...dset/16726/record/1>  
<http://health.data.g...dset/16733/record/1>  
<http://health.data.g...dset/16721/record/1>  
<http://health.data.g...dset/16720/record/1>  
<http://health.data.g...dset/16718/record/1>  
<http://health.data.g...dset/16717/record/1>  
<http://health.data.g...dset/16725/record/1>  
<http://health.data.g...dset/16741/record/1>  
<http://health.data.g...dset/16732/record/1>  
<http://health.data.g...dset/16731/record/1>  
<http://health.data.g...dset/16724/record/1>  
<http://health.data.g...dset/16740/record/1>  
<http://health.data.g...dset/16729/record/1>  
<http://health.data.g...dset/16738/record/1>  
<http://health.data.g...dset/16728/record/1>  
<http://health.data.g...dset/16737/record/1>

## Entity Relations Navigation

Text

# [6] /facet Browsing – Bookmark Your Query



where:

Entity1 is a **hosp:Hospital** . Drop

Entity1 **rdfs:label** Entity2 . Drop Entity2

Entity1 **hosp:mpvProvider** Entity3 . Drop Entity3 Entity3 = 1 . Drop

Entity1 **gd:stateCode** Entity4 . Drop Entity4 Entity4 = <http://reference.data.gov/id/state/CA> . Drop

Entity1 **hoco:recordset** Entity5 . Drop Entity5 Entity5 **hoco:record** Entity6 . Drop Entity6

[View query as SPARQL](#)

Showing 1-20 of 137 total [» Next](#)

You can save and  
bookmark the queries you  
generate from browsing  
facets!

**Entity Relations Navigation**

Text  [Set](#)

Types  
Attributes  
Referencing Attributes  
Distinct values (Aggregated)  
Show Matching Values

Places

Options

# [6] /facet Browsing – Examine Your Query



where:

Entity1 is a **hosp:Hospital** . Drop

Entity1 **rdfs:label** Entity2 . Drop Entity2

Entity1 **hosp:mpvProvider** Entity3 . Drop Entity3 Entity3 = 1 . Drop

Entity1 **gd:stateCode** Entity4 . Drop Entity4 Entity4 = <http://reference.data.gov/id/state/CA> . Drop

Entity1 **hoco:recordset** Entity5 . Drop Entity5 Entity5 **hoco:record** Entity6 . Drop Entity6

[View query as SPARQL](#)

Showing 1-20 of 137 total [» Next](#)

<http://health.data.g...dset/16739/record/1>  
<http://health.data.g...dset/16735/record/1>  
<http://health.data.g...dset/16726/record/1>  
<http://health.data.g...dset/16733/record/1>  
<http://health.data.g...dset/16721/record/1>  
<http://health.data.g...dset/16720/record/1>  
<http://health.data.g...dset/16718/record/1>  
<http://health.data.g...dset/16717/record/1>  
<http://health.data.g...dset/16725/record/1>  
<http://health.data.g...dset/16741/record/1>  
<http://health.data.g...dset/16732/record/1>  
<http://health.data.g...dset/16731/record/1>  
<http://health.data.g...dset/16724/record/1>  
<http://health.data.g...dset/16740/record/1>  
<http://health.data.g...dset/16729/record/1>  
<http://health.data.g...dset/16738/record/1>  
<http://health.data.g...dset/16728/record/1>  
<http://health.data.g...dset/16737/record/1>

## Entity Relations Navigation

Text

Types  
Attributes  
Referencing Attributes  
Distinct values (Aggregated)  
Show Matching Values

Places

Options  
Save  
Featured Queries  
New Search

# [6] /facet Browsing – Examine Your Query



where:

Entity1 is a **hosp:Hospital** . Drop

Entity1 **rdfs:label** Entity2 . Drop Entity2

Entity1 **hosp:mpvProvider** Entity3 . Drop Entity3 Entity3 = 1 . Drop

Entity1 **gd:stateCode** Entity4 . Drop Entity4 Entity4 = <<http://reference.data.gov/id/state/CA>> . Drop

Entity1 **hoco:recordset** Entity5 . Drop Entity5 Entity5 **hoco:record** Entity6 . Drop Entity6

[View query as SPARQL](#)

Now that you've generated a list (on the left) of all the records for all the hospitals in California that are Medicare payment volume providers using the faceted browsing feature (aka 'data surfing');

Take a look at the SPARQL query you generated by clicking on the '[View query as SPARQL](#)' link –

Which takes you to the next slide...

# [6] /sparql Endpoint – Select a Response Format

## OpenLink Virtuoso SPARQL Query

This query page is designed to help you test OpenLink Virtuoso SPARQL protocol endpoint.

Consult the [Virtuoso Wiki page](#) describing the service or the [Online Virtuoso Documentation](#) section [RDF Database and SPARQL](#).

There is also a rich Web based user interface with sample queries. You can access it at: [/sparql](#).

### Query

#### Default Graph URI

(Security restrictions of this server do not allow you to retrieve remote RDF data. Database administrator can change them, according to these [instructions](#).)

#### Query text

```
select distinct ?s6 as ?c1 where {?s1 a <http://health.data.gov/def/hospital/Hospital> . ?s1 <http://www.w3.org/2000/01/rdf-schema#label> ?s2 . ?s1 <http://health.data.gov/def/hospital/mpvProvider> ?s3 . filter (?s3 = 1) . ?s1 <http://reference.data.gov/def/govdata/stateCode> ?s4 . filter (?s4 = <http://reference.data.gov/id/state/CA>) . ?s1 <http://health.data.gov/def/hospital-compare/recordset> ?s5 . ?s5 <http://health.data.gov/def/hospital-compare/record> ?s6 . } order by desc (<LONG::IRI_RANK> (?s6)) limit 20 offset 0
```

of the query:  Execution timeout, in milliseconds, values less than 1000 are ignored:  Format Results As:

Auto  
 HTML (The CXML output is disabled, see [details](#))  Display the result and not save

Spreadsheet  
 XML  
 JSON  
 Javascript  
 NTriples  
 RDF/XML  
 CSV

# [6] /sparql Endpoint – Select a Response Format

## OpenLink Virtuoso SPARQL Query

This query page is designed to help you test OpenLink Virtuoso SPARQL protocol endpoint.

Consult the [Virtuoso Wiki page](#) describing the service or the [Online Virtuoso Documentation](#) section [RDF Database and SPARQL](#).

There is also a rich Web based user interface with sample queries. You can access it at: [/sparql](#).

### Query

#### Default Graph URI

(Security restrictions of this server do not allow you to retrieve remote RDF data. Database administrator can change them, according to these [instructions](#).)

#### Query text

```
select distinct ?s6 as ?c1 where {?s1 a <http://health.data.gov/def/hospital/Hospital> . ?s1 <http://www.w3.org/2000/01/rdf-schema#label> ?s2 . ?s1 <http://health.data.gov/def/hospital/mpvProvider> ?s3 . filter (?s3 = 1) . ?s1 <http://reference.data.gov/def/govdata/stateCode> ?s4 . filter (?s4 = <http://reference.data.gov/id/state/CA>) . ?s1 <http://health.data.gov/def/hospital-compare/recordset> ?s5 . ?s5 <http://health.data.gov/def/hospital-compare/record> ?s6 . } order by desc (<LONG::IRI_RANK> (?s6)) limit 20 offset 0
```

Format of the query:  Execution time  
Auto  
**HTML**  
Spreadsheet  
XML  
JSON  
Javascript  
NTriples  
RDF/XML  
CSV

(The CXML output is disabled, see [FAQ](#))

OpenLink Virtuoso

You'll end up at the SPARQL endpoint service at  
<http://health.data.gov/sparql>  
where you can select multiple query response formats – we'll select JSON, since it's such a popular format for mashup apps.

# [6] /sparql Endpoint – Run Your Query

This query page is designed to help you test OpenLink Virtuoso. Consult the [Virtuoso Wiki page](#) describing the service or the [Online Virtuoso Documentation](#) section [RDF Database and SPARQL](#). There is also a rich Web based user interface with sample queries. You can access it at: [/sparql](#).

**Query**

**Default Graph URI**

(Security restrictions of this server do not allow you to retrieve remote RDF data. Database administrator can change them, according to these [instructions](#).)

**Query text**

```
select distinct ?Hospital ?Record_URI
where {
?s1 a <http://health.data.gov/def/hospital/Hospital> .
?s1 <http://www.w3.org/2000/01/rdf-schema#label> ?Hospital .
?s1 <http://health.data.gov/def/hospital/mpvProvider> ?s3 .
filter (?s3 = 1) . ?s1 <http://reference.data.gov/def/govdata/stateCode> ?s4 .
filter (?s4 = <http://reference.data.gov/id/state/CA>).
?s1 <http://health.data.gov/def/hospital-compare/recordset> ?s5 .
?s5 <http://health.data.gov/def/hospital-compare/records> ?Record_URI .
}
```

Rigorous check of the query:  Execution timeout, in milliseconds, values less than 1000 are ignored:  Format Results As:

JSON  (The CXML output is disabled, see [details](#))  Display the result and not save

Run Query  Reset

# [6] /sparql Endpoint – Run Your Query

This query page is designed to help you test OpenLink Virtuoso. Consult the [Virtuoso Wiki page](#) describing the service or the [Online Virtuoso Documentation](#) section [RDF Database and SPARQL](#).

There is also a rich Web based user interface with sample queries. You can access it at: [/sparql](#).

**Query**

**Default Graph URI**

(Security restrictions of this server do not allow you to retrieve remote RDF data. Database administrators can change this setting.)

**Query text**

```
select distinct ?Hospital ?Record_URI  
where {  
?s1 a <http://health.data.gov/def/hospital/Hospital> .  
?s1 <http://www.w3.org/2000/01/rdf-schema#label> ?Hospital .  
?s1 <http://health.data.gov/def/hospital/mpvProvider> ?s3 .  
filter (?s3 = 1) . ?s1 <http://reference.data.gov/def/govdata/stateCode> ?s4 .  
filter (?s4 = <http://reference.data.gov/id/state/CA>) .  
?s1 <http://health.data.gov/def/hospital--compare/recordset> ?s5 .  
?s5 <http://health.data.gov/def/hospital--compare/records> ?Record_URI .  
}
```

Rigorous check of the query:  Execution timeout, in milliseconds, values less than 10000

JSON (The CXML output is disabled, see [details](#)) Display the result and not save

Run Query Reset

You might also want to make minor edits to the SPARQL query you generated, reformatting it for readability, making variable names that get used as results headers more meaningful to humans, before you click ‘Run Query’ (on the bottom left)

# [6] /sparql Endpoint – Run Your Query

This query page is designed to help you test OpenLink Virtuoso. Consult the [Virtuoso Wiki page](#) describing the service or the [Online Virtuoso Documentation](#) section [RDF Database and SPARQL](#).

There is also a rich Web based user interface with sample queries. You can access it at: [/sparql](#).

**Query**

**Default Graph URI**

(Security restrictions of this server do not allow you to retrieve remote RDF data. Database administrators can change this setting.)

**Query text**

```
select distinct ?Hospital ?Record_URI  
where {  
?s1 a <http://health.data.gov/def/hospital/Hospital> .  
?s1 <http://www.w3.org/2000/01/rdf-schema#label> ?Hospital .  
?s1 <http://health.data.gov/def/hospital/mpvProvider> ?s3 .  
filter (?s3 = 1) . ?s1 <http://reference.data.gov/def/govdata/stateCode> ?s4 .  
filter (?s4 = <http://reference.data.gov/id/state/CA>) .  
?s1 <http://health.data.gov/def/hospital--compare/recordset> ?s5 .  
?s5 <http://health.data.gov/def/hospital--compare/records> ?Record_URI .  
}
```

Rigorous check of the query:  Execution timeout, in milliseconds, values less than 10000

JSON (The CXML output is disabled, see [details](#)) Display the result and not save

**Run Query** **Reset**

You might also want to make minor edits to the SPARQL query you generated, reformatting it for readability, making variable names that get used as results headers more meaningful to humans, before you click ‘Run Query’ (on the bottom left)

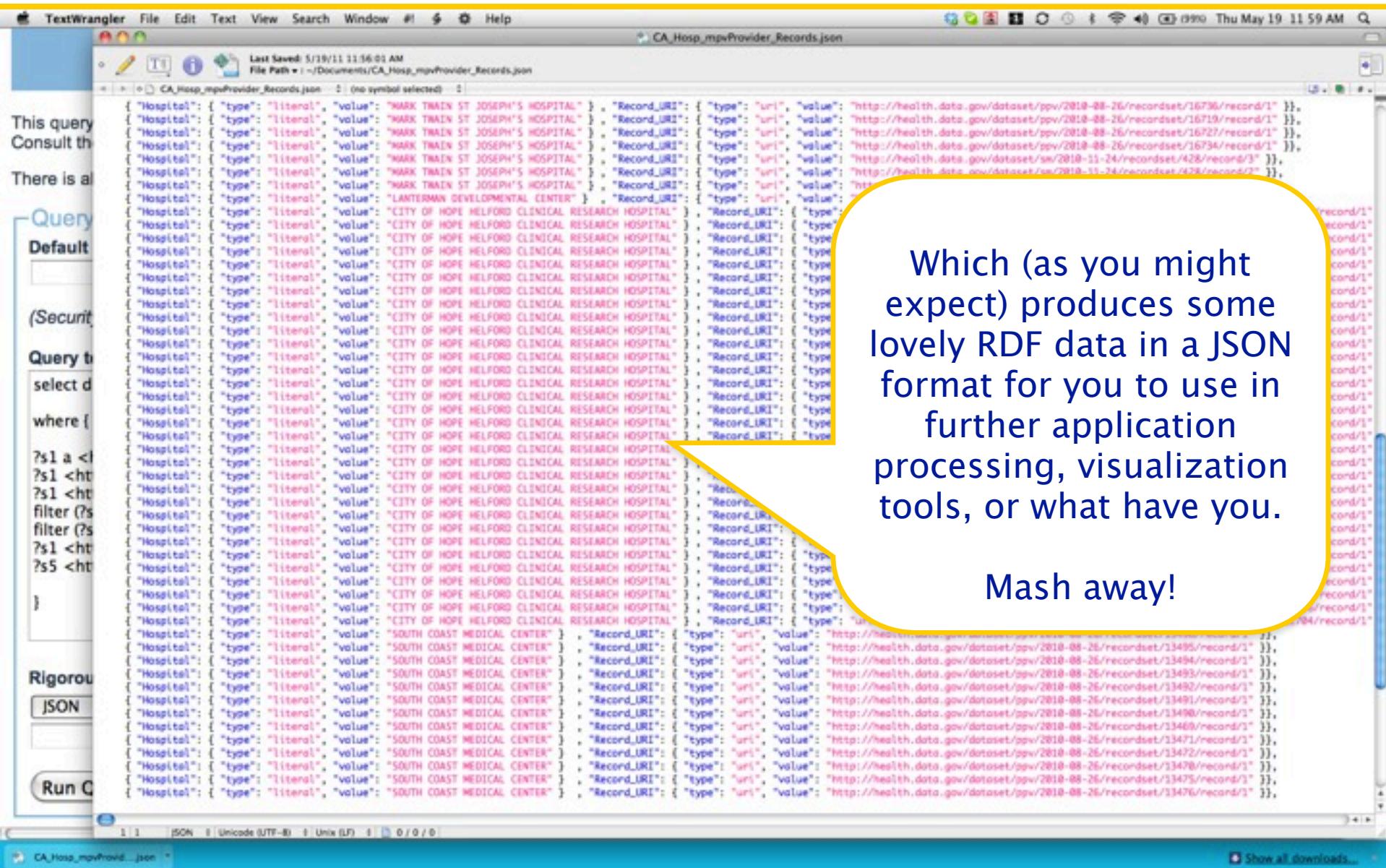
## [6] /sparql – Mash on Your Results

# [6] /sparql – Mash on Your Results

This query  
Consult th  
There is al  
Query  
Default  
(Secure  
Query ti  
select d  
where {  
?s1 a <  
?s1 <ht  
?s1 <ht  
filter (?s  
filter (?s  
?s1 <ht  
?s5 <ht  
}  
  
Rigorou  
JSON  
Run C

Last Saved: 5/19/11 11:56:03 AM  
File Path: ~/Documents/CA\_Hosp\_mvpProvider\_Records.json

CA\_Hosp\_mvpProvider\_Records.json



Which (as you might expect) produces some lovely RDF data in a JSON format for you to use in further application processing, visualization tools, or what have you.

Mash away!

CA\_Hosp\_mvpProvid...json Show all downloads...

# [7] Facet Service API

- Retrieve a list of Hospitals (instances of type Hospital)
  - Using cURL and your favorite terminal shell:

```
curl -H "Content-Type: text/xml" -d @post.xml http://health.data.gov/fct/service
```

```
calder:Documents glyf$ curl -H "Content-Type: text/xml" -d @post.xml http://health.data.gov/fct/service
```

- Where post.xml is a simple ‘Plain Old XML’ (POX) file containing the following query;

```
<?xml version="1.0"?>
<query>
  <class iri="[hosp:Hospital]" />
  <view type="list" />
</query>
```

# [7] Facet Service API

- And get POX returned

```
<fct:facets>
  <fct:result>
    [...snip]
    <fct:row>
      <fct:column datatype="url">http://health.data.gov/id/hospital/393303</fct:column>
    </fct:row>
    <fct:row>
      <fct:column datatype="url">http://health.data.gov/id/hospital/160156</fct:column>
    </fct:row>
    [...snip...]
  </fct:result>
</fct:facets>
```

# [8] Questions?

- Contact:

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