**ODCleanStore Framework**

Michelfeit, Jan
2012

# ODCleanStore

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# Outline

- Motivation – how to get clean data?
- What is ODCleanStore
- Examples of data processing
- Example of querying the data

# Motivation

CLEAN DATA

Integration

Trust

Provenance

ODCleanStore

# Motivation

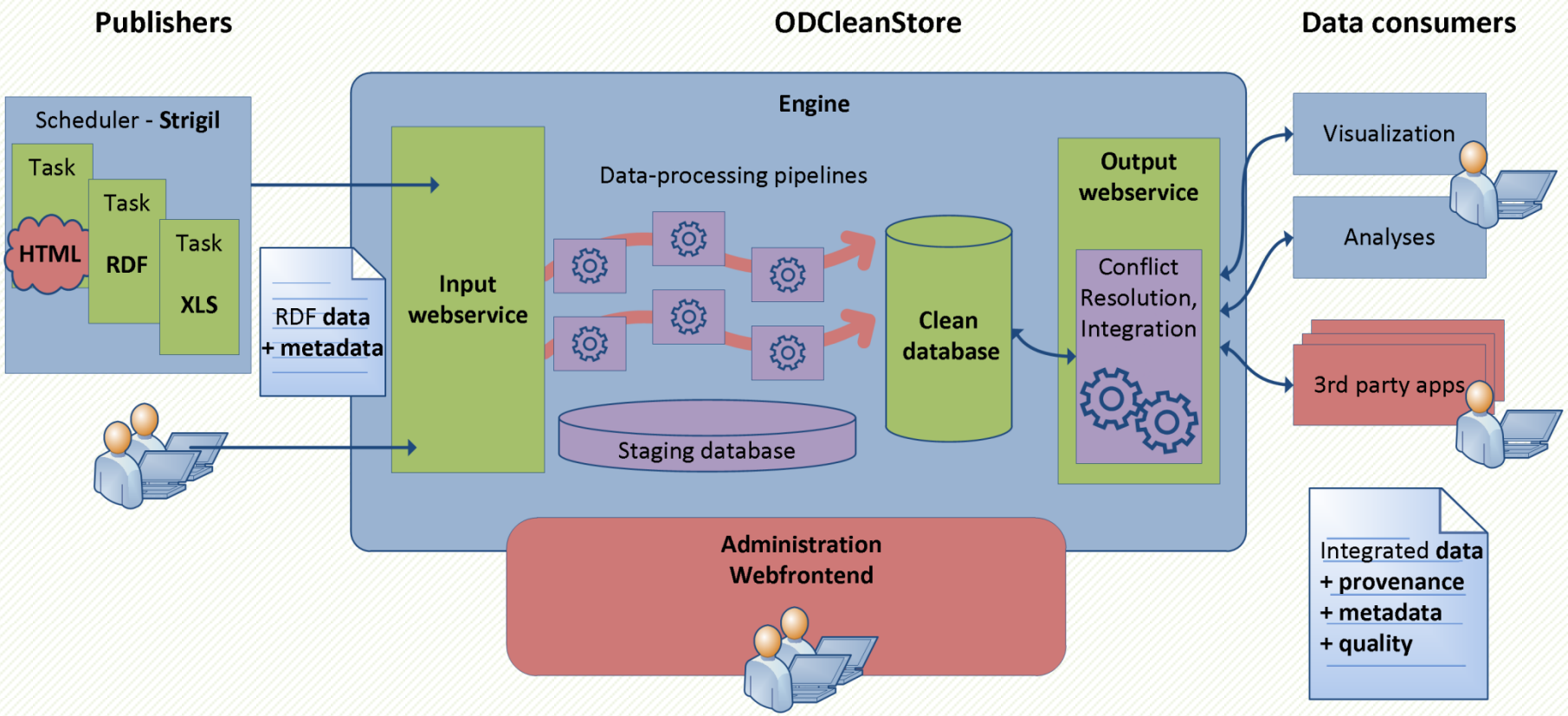
- OpenData.cz
  - Initiative for transparent data infrastructure
  - Public procurement use case

1. Extract
2. Process
3. Store
4. Publish

# ODCleanStore

- Tool for management of Linked Data
- Server application, Open Source (Java)
- Data
  - processing
    - customizable, mutliple data sources
  - storage
  - access, integrated views on data
    - standard technologies, REST, RDF, SPARQL endpoint
- Web administration interface

# ODCleanStore & other projects



# Example

## ODCleanStore - Administration

Home | Pipelines | Rules | Engine | Output webservice | Onto

Home

### Welcome to ODCleanStore Administratio

Welcome to administration of ODCleanStore, a Linked Data management

ODCleanStore

- accepts, processes and stores RDF data;
- makes data processing highly customizable;
- provides predefined transformers for data processing;
- provides integrated views on stored data;
- supports data provenance tracking and quality estimation;
- uses standard technologies in order to make integration with other ap

For more information, visit the official website or consult user manual (draft

## ODCleanStore - Administration

Home | Pipelines | Rules | Engine | Output webservice | Ontologies | Accounts | Transformers | Prefixes

Home > Backend > Pipelines > Edit

**User:** adm **Roles:** PIC, ADM, ONC My Account Log out

### Edit a pipeline

Back to the list of pipelines

Help

**Label:**

test-pipeline *

**Description:**

description

Submit

**Is default:**

No

### Assigned transformers

Assign a transformer

View graphs in error

Help

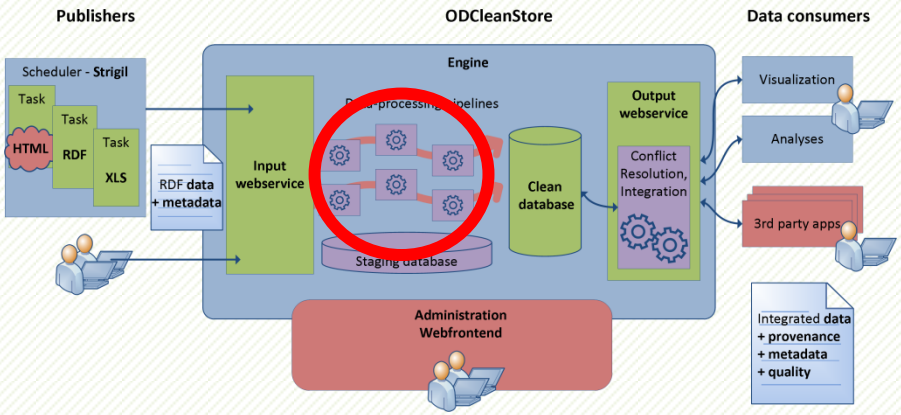
| Order | Label | Configuration | Allow to be run on clean DB | Action |
|---|---|---|---|---|
| 1 | Blank node remover | | No | Detail Up Down Delete |
| 2 | Data Normalization | | Yes | Detail Up Down Delete |
| 3 | Quality Assessment | | Yes | Detail Up Down Delete |
| 4 | Linker | linkWithinGraph=false | Yes | Detail Up Down Delete |
| 5 | Quality Aggregator | | Yes | Detail Up Down Delete |

# Example

1. Define extraction scripts
2. Create pipelines
   I. Cleaner (Data Normalization)
   II. Quality Assessment
   III. Linker
   IV. ... custom transformers
3. Start sending data
4. Clean database
5. Browse the data

# Transformer: Cleaner (Normalization)

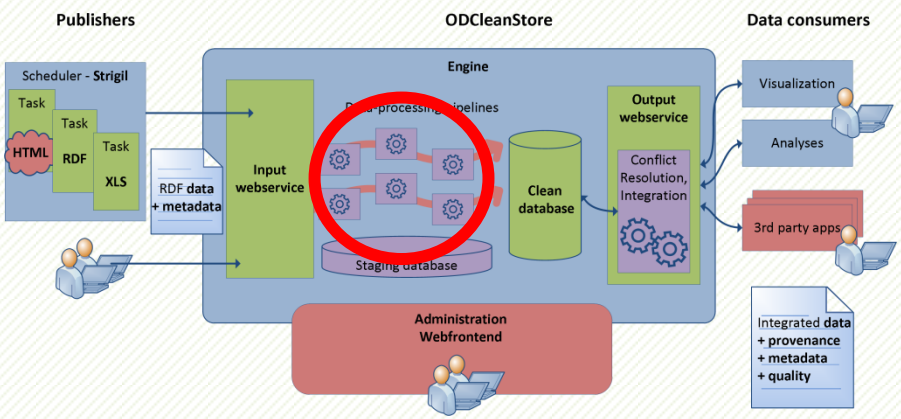
- Basic cleaning operations, e.g.
  - converting date formats
  - merging object values from two properties
  - removal of invalid values
- Configured by user-defined rules
  - SPARUL based



# Transformer: Linker

- Creation of links between entities
  - e.g. `owl:sameAs` link between business entities based on their identification number
  - link cities based on their name and location

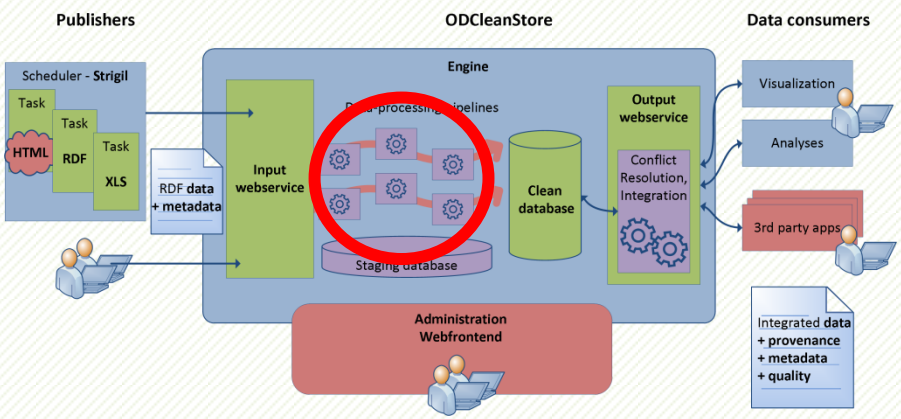
- Based on Silk



# Transformer: Quality Assessment

- Computes data score based on user policies, e.g.
  - email value has a correct format
  - value of `pc:awardDate` is before `pc:publicationDate`

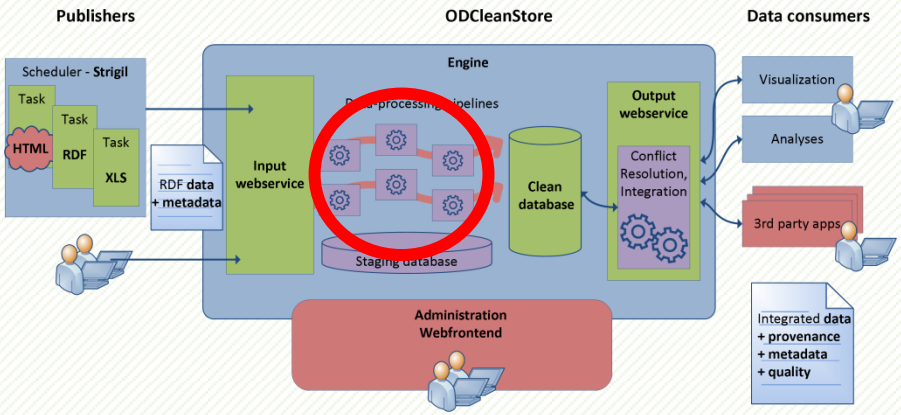
- SPARQL based



# Custom transformers

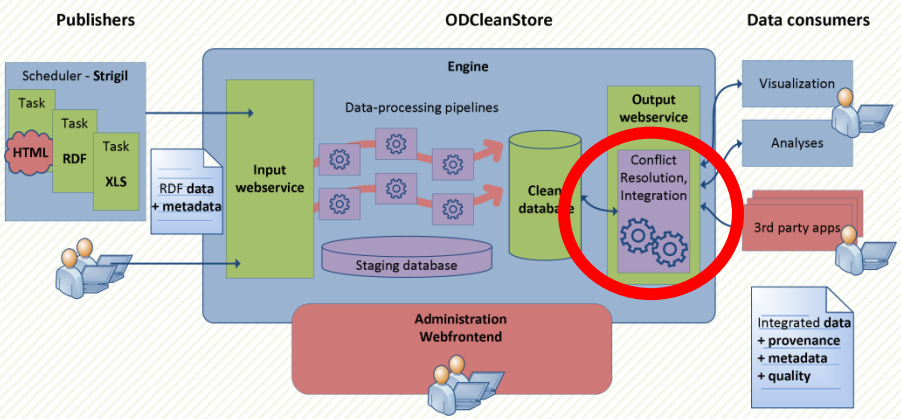
- You can write your own,

  e.g. checker of identification number in the Business Register



# Conflict Resolution

- Resolution of conflicts at query time
  - based on user policies
  - aggregation – e.g. average geographic location
- Transparently resolves sameAs links and vocabulary mappings
- Provenance tracking, quality scores



# Conflict Resolution

## ODCleanStore - URI query

Server address: localhost:8087

Searched URI: dbpedia:Berlin

Default aggregation: ALL

Default multivalue: NO

Aggregation error strategy: RETURN_ALL

| | | |
|---|---|---|
| Property aggregation | freebase:location.geocode.latitude | AVG |
| Property aggregation | freebase:location.geocode.longtitude | AVG |
| Property aggregation | dbo:populationTotal | LATEST |
| Property multivalue | http://www.w3.org/1999/02/22-rdf-syntax-ns#type | YES |
| Property multivalue | | NO |
| Property multivalue | | NO |

Output format: HTML

Submit

If you cannot connect to the server, make sure you have ODCleanStore Engine running.

# Conflict Resolution

## ODCleanStore - URI query

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# Conflict Resolution

URI query for <http://dbpedia.org/resource/Berlin>. Query executed in 0.569 s.

| Subject | Predicate | Object | Quality | Source named graphs |
|---|---|---|---|---|
| *dbpedia:Berlin* | dbo:country | dbpedia:Germany | 0.90000 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/dbpedia |
| *dbpedia:Berlin* | dbo:populationTotal | "3420768" ^^xsd:integer | 0.79598 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/linkedgeodata |
| *dbpedia:Berlin* | http://linkedgeodata.org/property/capital | "yes" | 0.80000 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/linkedgeodata |
| *dbpedia:Berlin* | freebase:location.geocode.latitude | "44.695598392734375" ^^xsd:double | 0.55381 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/error, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/dbpedia, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/linkedgeodata, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/freebase, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/geonames |
| *dbpedia:Berlin* | freebase:location.geocode.longtitude | "13.402740096987914" ^^xsd:double | 0.82446 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/linkedgeodata, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/dbpedia, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/geonames, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/freebase |
| *dbpedia:Berlin* | rdf:type | http://schema.org/City | 0.92000 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/dbpedia, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/freebase |
| *dbpedia:Berlin* | rdf:type | http://schema.org/Place | 0.90000 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/dbpedia |
| *dbpedia:Berlin* | rdfs:label | "Berlin" | 0.94252 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/geonames, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/dbpedia, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/freebase, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/geonames, http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/linkedgeodata |
| *dbpedia:Berlin* | rdfs:label | "Berlino"@it | 0.56970 | http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/linkedgeodata |

Source graphs:

| Named graph | Data source | Inserted at | Graph score | License | Update tag |
|---|---|---|---|---|---|
| http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/dbpedia | http://dbpedia.org/page/Berlin | 2012-04-01 12:34:56.0 | 0.9 | | |
| http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/error | http://example.com | | 0.8 | | |
| http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/freebase | http://www.freebase.com/view/en/berlin | 2012-04-02 12:34:56.0 | 0.8 | | |
| http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/geonames | http://www.geonames.org/2950159/berlin.html | 2012-04-03 12:34:56.0 | 0.8 | | |
| http://odcs.mff.cuni.cz/namedGraph/qe-test/berlin/linkedgeodata | http://linkedgeodata.org/page/node240109189 | 2012-04-04 12:34:56.0 | 0.8 | | |

# Conclusion

- ODCleanStore
- Related projects
- Public procurement use case
- Why ODCleanStore
  - standard technologies, Linked Data
  - Open Source server application, administration from your web browser
  - quality & provenance tracking
  - conflict resolution customized to your query

# Thank you

# ... Questions?

**Download:**
**http://goo.gl/49V1L**
**http://sourceforge.net/p/odcleanstore/**

**odcleanstore-user@lists.sourceforge.net**

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