Fedora 4 hands-on

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F4: Linked Data Platform server

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- We're working with resources and making statements about them.
- RDF (resource description framework) is the language we're using for this.
  - http://presentations.zazuko.com/docuteam-cday-2018/#7
- The statements are formulated as triples: subject -> predicate -> object
  - https://www.w3.org/TR/rdf11-concepts/#resources-and-statements
- Resources should be identifiable, preferably in a global manner (IRI)
  - http://presentations.zazuko.com/docuteam-cday-2018/#9

- Example: <filmclip> dc:title "Sierra Leone Independence Day celebration"

- Test instance for the day: http://cday-fedora4.docuteam.ch:8080/fcrepo

LDP: Vocabularies

Not every organization/user has to re-define well-known and accepted terms and assign a semantic. Rather, more and more controlled vocabularies exist, e.g.:

- Wikidata https://www.wikidata.org
- Dbpedia https://wiki.dbpedia.org/
- Library of Congress Preservation https://id.loc.gov/
- GeoNames http://www.geonames.org/

Using these vocabularies, we don't need to re-invent the wheel but rather base on accepted semantic.

- Example of today's context:
  – <filmclip> <relates to> <Freetown>
  – <http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/bb/16/d9/bc/bb16d9bc-6277-46b4-bdf5-246f280f3cf7> dc:coverage <https://www.wikidata.org/wiki/Q3780>

LDP: Ontologies

- We can define rules on how resources and predicates can be used.
- Also in this area, we cannot only create our own rules, but re-use existing ontologies, e.g.:
  - Dublin Core
  - FOAF
  - schema.org
  - SKOS
  - PREMIS
  - RiC (work in progress)

- These ontologies define a semantic available for certain types of resources. Using these mechanisms, our data becomes
  - more reliable
  - re-usable (because others can understand our data more easily)

F4: PCDM

In the context of Fedora, a number of key users have produced a simple ontology to model objects predominant in the cultural sector: Portland Common Data Model

- https://pcdm.org/
- https://github.com/duraspace/pcdm/wiki

F4: CRUD
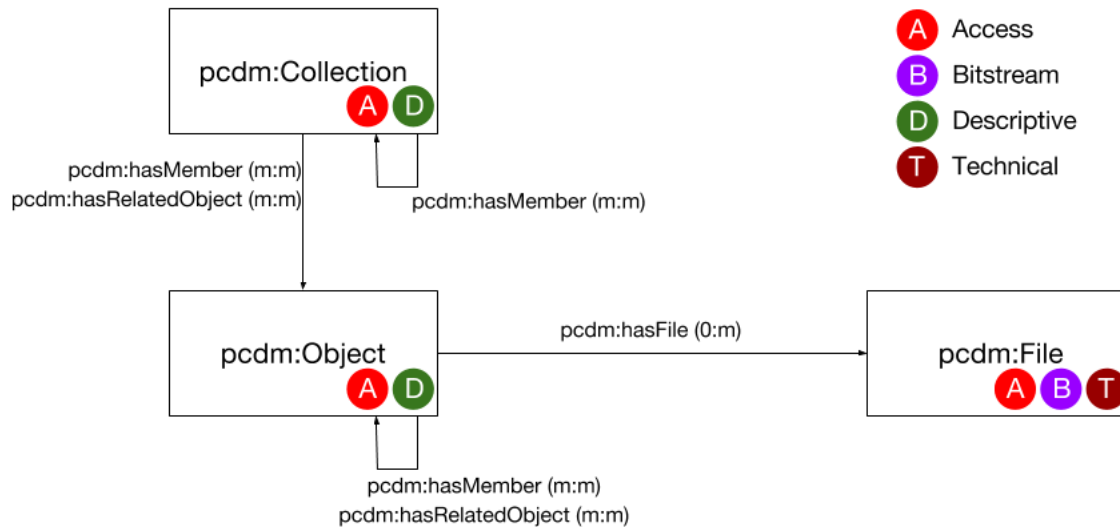
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http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/

Home

Created at
by
Last Modified at
2018-10-30T23:06:37.392Z by
Children 10
1. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/52/61/a4/ec/5261a4ec-0be6-485e-9068-859cda18cd13
2. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/o/ne/file
3. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/05/28/5f/df/05285fdf-3d1c-4550-9284-263f81df7c3b
4. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/bb/16/d9/bc/bb16d9bc-6277-46b4-bdf5-246f280f3cf7
5. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/pathA/to/Demo_SIP
6. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/38/a8/d0/41/38a8d041-b847-408a-ab42-50f0391ab0a8
7. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/path4/to/Wiederholfelder
8. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/7a/77/29/e1/7a7729e1-d98e-49e5-bf3b-74b52dbd808b
9. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/pathB/to/sip_1
10. http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/.well-known

Properties   +

Other Resources

Create New Child Resource

Type

container

Identifier

(auto-generated identifier)

RDF (turtle)

<> a <http://purl.org/dc/dcmitype/Collection>

Add

Update Properties

PREFIX premis: <http://www.loc.gov/premis/rdf/v1#>
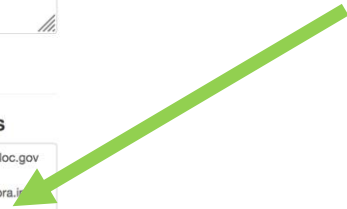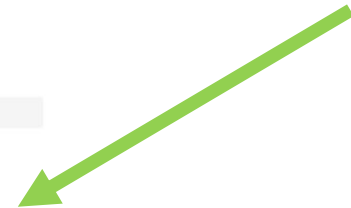PREFIX indexing: <http://fedora.i/definitions/v4/indexing#>
PREFIX test: <info:fedora/test/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsi: <http://www.w3.org/2001/XMLSchema-instance>
PREFIX xmlns: <http://www.w3.org

Update

Create Version Snapshot

(auto-generated name)

Create Version

6

F4: CRUD

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Just a few of the basic operations available in the web GUI:

- Create resources
  - RDF Source/Container
  - Non-RDF Source/Binary
- Add triples
  - literals
  - to other resources
- Create Versions
- Use Transactions
- Verify fixity

F4: Search

- Referring to the morning's presentation, Fedora 4 is the native linked data platform and focuses on a few core functionalities.
- Anything else is supposed to be covered by specific services connecting to the well-defined extension points and mechanisms of Fedora 4:
  - LDP API
  - Messaging service
  - Storage management

Specifically, Fedora does not offer much search/index functionality. Rather, it comes with a collection of extension mechanisms that make use of the emitted messages and index information consecutively.

One implementation is using Fuseki as a triplestore:

http://cday-fedora4.docuteam.ch:8080/fuseki/index.html

F4: SPARQL

Fedora 4 SPARQL Endpoint

- The SPARQL endpoint for Fedora 4 is setup as an external service, using messages emitted from Fedora to process new/updated resources.

- The reference setup is using Fuseki and is available at http://cday-fedora4.docuteam.ch:8080/fuseki/

- All examples are based on this resource: http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/05/28/5f/df/05285fdf-3d1c-4550-9284-263f81df7c3b

F4: SPARQL

Example: information on a specific resource

SELECT ?predicate ?object
WHERE {
        <http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/05/28/5f/df/05285fdf-
3d1c-4550-9284-263f81df7c3b> ?predicate ?object
}
ORDER BY ?predicate

F4: SPARQL

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Example: direct child objects of a resource

PREFIX ldp: <http://www.w3.org/ns/ldp#>
SELECT ?child
WHERE {
        <http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/05/28/5f/df/05285fdf-
3d1c-4550-9284-263f81df7c3b> ldp:contains ?child
}
ORDER BY ?child

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Example: all dependents of a resource

PREFIX dc: <http://purl.org/dc/elements/1.1/>
PREFIX ldp: <http://www.w3.org/ns/ldp#>

select ?child ?title where {

  <http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/05/28/5f/df/05285fdf-3d1c-4550-9284-263f81df7c3b> ldp:contains/ldp:contains* ?child .
  ?child dc:title ?title .
}

F4: SPARQL

Example: show all root objects

PREFIX ldp: <http://www.w3.org/ns/ldp#>
PREFIX dc: <http://purl.org/dc/elements/1.1/>

SELECT ?rootObject ?title
WHERE {
 <http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/> ldp:contains ?rootObject .
 ?rootObject dc:title ?title
}
            or, alternatively
PREFIX rdau: <http://rdaregistry.info/Elements/u/>
PREFIX dc: <http://purl.org/dc/elements/1.1/>
SELECT ?rootObject ?title
WHERE {
   ?rootObject rdau:P60049 "root" .
   ?rootObject dc:title ?title
}

F4: SPARQL

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Example: query WikiData

```
PREFIX rdau: <http://rdaregistry.info/Elements/u/>
PREFIX wdt: <http://www.wikidata.org/prop/direct/>
PREFIX wd: <http://www.wikidata.org/entity/>
PREFIX wikibase: <http://wikiba.se/ontology#>
PREFIX bd: <http://www.bigdata.com/rdf#>

SELECT ?subject ?predicate ?author ?familyName ?givenName
WHERE
{
    # Mock up some data:
    BIND(<http://cday-fedora4.docuteam.ch:8080/fcrepo/rest/pathB/to/sip_1/f1/doc1.jpg> AS ?subject) .
    BIND(wd:Q9061 AS ?author) .
    BIND(rdau:P60434 AS ?predicate) .

    OPTIONAL {
        SERVICE <https://query.wikidata.org/sparql> {
            ?author wdt:P735 ?givenName .
            ?author wdt:P734 ?familyName .
        }
    } .
}
```

SPARQL: External resources

- https://query.wikidata.org
- https://en.wikibooks.org/wiki/SPARQL