Datalink recognition outside Obscore context

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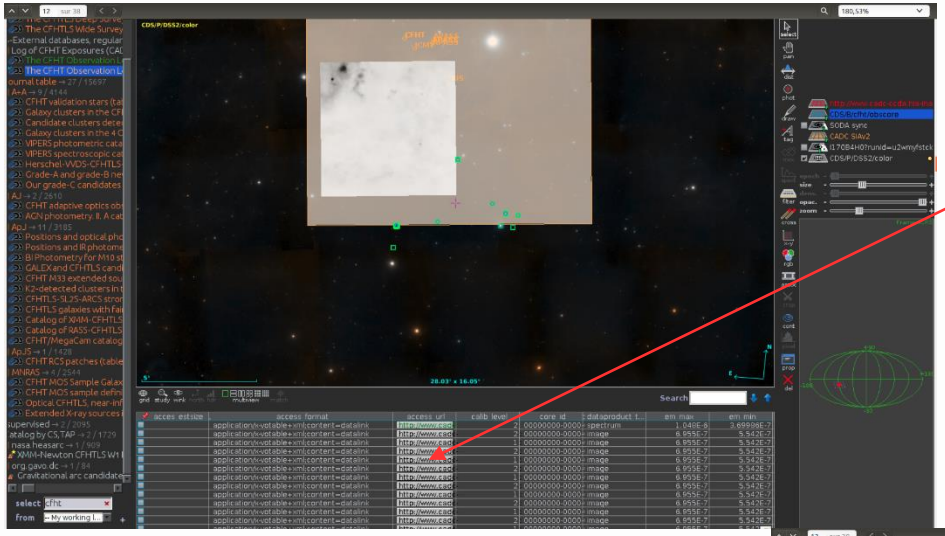
Asterics

Astronomy ESFRI & Research Infrastructure Cluster

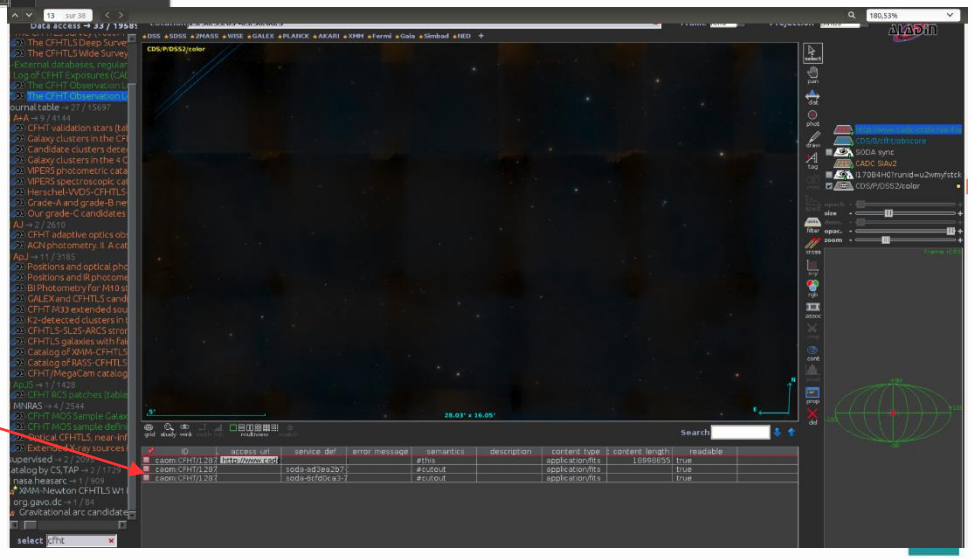
IVOA

The datalink issue
(excerpt of Chaitra presentation)



The field with the Datalink url is not recognized as such. Client cannot prepare appropriate behavior (DataLink popup window)

DataLink table is displayed in a wrong mode / not recognized as such



Possible solutions
1) Asterics Hackathon one

- Add a complement to the url ucd of the field

<FIELD name="url" ucd="meta.ref.url;meta.type.datalink" datatype="char" arraysize="128*">

  - Pros :
    - Self consistent
  - Cons :
    - Ucd approach difficult to generalize: Fuzzy+fuzzy not always gives accurate meaning
    - Doesn't work if url format changes from line to line

Possible solutions
2) additional obscore access utype

- Add a « access.datalink » utype to ObsCore
  - Pros :
    - self consistent
    - Let ucd usage free
  - Cons :
    - Requires Modification of ObsCore
    - Doesn't work if url format changes from line to line

Possible solutions
3) VOTABLE solution : LINK

- use the LINK element specifying a fIELD:
  - <FIELD...> <LINK content-type="xxx" href="xxx" ...>
  - Example for a FITS image:

```
<FIELD name="Image" ucd="meta.ref.url" datatype="char" arraysize="1">
 <DESCRIPTION>[YN] Epic image of this observation (FITS)</DESCRIPTION>

  <LINK content-type="image/fits" title="Image" href="http://vizier.u-strasbg.fr/viz-bin/nph-htx/A?%5cvizContent%7b${Image}foo&bar"/>
</FIELD>
...
```

  - Current list of content-types : image/fits, spectrum/fits, catalof/fits , etc..
  - Behavior of application (Aladin) changes according to that
  - Add content-type = "votable/xml;datalink
- Pros :
  - Extends already working functionality.
  - URL templating
  - Self consistent
- Cons :
  - Doesn't work if url format changes from line to line

----→ Preferred to 1)

Possible solutions
4) ObsCore-like solution

- Add a format column + other ObsCore-like columns

```
<RESOURCE ID="yCat_102009" name="B/xmm">
 <DESCRIPTION>XMM-Newton Observation Log (XMM-Newton Science Operation Center, 2012)</DESCRIPTION>
 <COOSYS ID="J2000" system="eq_FK5" equinox="J2000"/>
 <TABLE ID="B_xmm_xmmlog" name="B/xmm/xmmlog">
<DESCRIPTION>The XMM-Newton Observation log (2017-04-24)\vizContent{image/fits}</DESCRIPTION>
...
  <GROUP utype="Obs.obs">
    <FIELDREF ref="A" utype="Obs:obsdataset.dataproducttype" />
    <FIELDREF ref="B" utype="Obs:access.format" />
<FIELDREF ref="C" utype="Obs:access.reference" />
    <FIELDREF ref="D" utype="Obs:dataID.title" />
  </GROUP>
–                ...
  <FIELD ID="A" name="Product">
    <DESCRIPTION>Product type (image | spectre | timeseries | document)</DESCRIPTION>
  </FIELD>
<FIELD ID="B" name="Format">
     <DESCRIPTION>Encoding format</DESCRIPTION>
  </FIELD>
  <FIELD ID="C" name="Image" ucd="meta.ref.url" datatype="char" arraysize="1">
   <DESCRIPTION>[YN] Epic image of this observation (FITS)</DESCRIPTION>
  </FIELD>
  <FIELD ID="D" name="Label">
   <DESCRIPTION> Product label </DESCRIPTION>
  </FIELD>
...
  <DATA><TABLEDATA>
    <TR>
      ...
      <TD>image</TD>
      <TD>fits</TD>
      <TD>http://vizier.u-strasbg.fr/viz-bin/nph-htx?myimage3145</TD>
      <TD>image 3145
```

- Pros :
  - Utype/ucd complementarity
  - Allows variability from line to line
  - Full description
- Cons
  - Requires adding fields (or params) and a group

----→ Preferred to 2)

Possible Evolution of dataset discovery and access

F. Bonnarel (CDS)

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Current multidimensional data protocols (SIAV2 set)

- A full family of bounded protocols
  - SIA2.0
  - ObsTAP with Obscore 1.1
  - DataLink
  - SODA
- Main properties
  - ObsTAP and SIA2 allow archived dataset discovery
    - Constraints on all four data axes (spatial, spectral, time and pol) by ADQL (ObSTAP/Core) or PQL (SIA2.0)
  - SODA only allows cutouts and selection
  - Glue among those is made by DataLink technology
  - DALI compliant / sync and async / ucd 1+ and utypes + xtypes

Quick look to older protocols SIAV1 and SSA

- SCS not relevant for datasets
- SIAV1:
  - had no standard possibility to query on BAND / TIME / POL
  - had old style ucd, no utypes, no DALI compliancy, etc..
  - had virtual data discovery functionality including rebinning/reprojection on provided WCS → not in SIAV2 set
- SSA :
  - also provided some virtual data discovery (apparently insufficient / see Petr Talk) ---> not in SIAV2 set
  - had specific spectral input parameters eg VARAMP and REDSHIFT ---> not in SIAV2 set
  - had more output fields (target description , accuracy on all axes) than ObsCore.
- –-> protocols less achieved but with a few things still missing in « SIAV2 set »

TimeSeries requirements

Don't forget : top 1 CSP priority

- For Discovery (see my talk in TDIG/DAL/DM session)
  - Basic Obscore +
    - Time standard deviation
    - Time sampling location, bounds, standard deviation
    - Time frequency characterisation
    - Variablity, period ???
    - Target name and class
  - Virtual data discovery : TimeSeries has to be created from the database content by the query

TimeSeries requirements

Don't forget : top 1 CSP priority

- For access (see also ASTERICS requirements on Thursday)
  - Delivering set of ND points with generally sparsed time axis and one to several dependant axes (flux, velocity, position, … spectra, images ….)
  - Provenance of ND point or ND point additional metadata
  - Time scale / time frame description.
  - MJD representation
  - periodograms

Spectra (see Petr talk)

- More imput parameters for targets
- Virtual data discovery
  - to avoid 2 step discovery and SODA access via DataLink and get similar discovery/access parameters
- Extension of standard SODA to spectra
- More functionalities in SODA (formats, rebinning, axis transformation)
- Etc...

Images and cube

- Virtual image (or cube) discovery :

  à la HEASARC « Skyview »

- Pixel cutouts and rebinning/reprojection
- HiPS ←-> « SIAV2 set of services » back and forth combination

Towards a new Discovery protocol ?

- Instead of SIA2.1 + SSA2 +TS1.0, new DsDisc protocol defined by
  - ObsCore extensions
    - Extension of Obscore for TS metadata
    - Extension of Obscore for spectra
    - Extension for others : visibilities ,
  - New dataproduct type specific PQL parameters
  - Virtual data discovery = access.reference is a « best match » SODA Url

SODA 1.1 ? /SODA 2 ?

- Valid for TimeSeries, spectra, others
- Providing rebinning/reprojection and pixel cutout
- HiPS combination
- Providing extended metadata (special dataset view)
  - using datamodel (VO-DML) serialization
  - Used to be in SIAV2.1 getGoryDetails → getMetadata in previous roadmaps
- Forced and driven by requested dataset representation
  - ObsCore / Dataset/Cube DM