ProvTAP
status report

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acknowledge the « provenance » author team of the DM WG

Provenance UML diagram

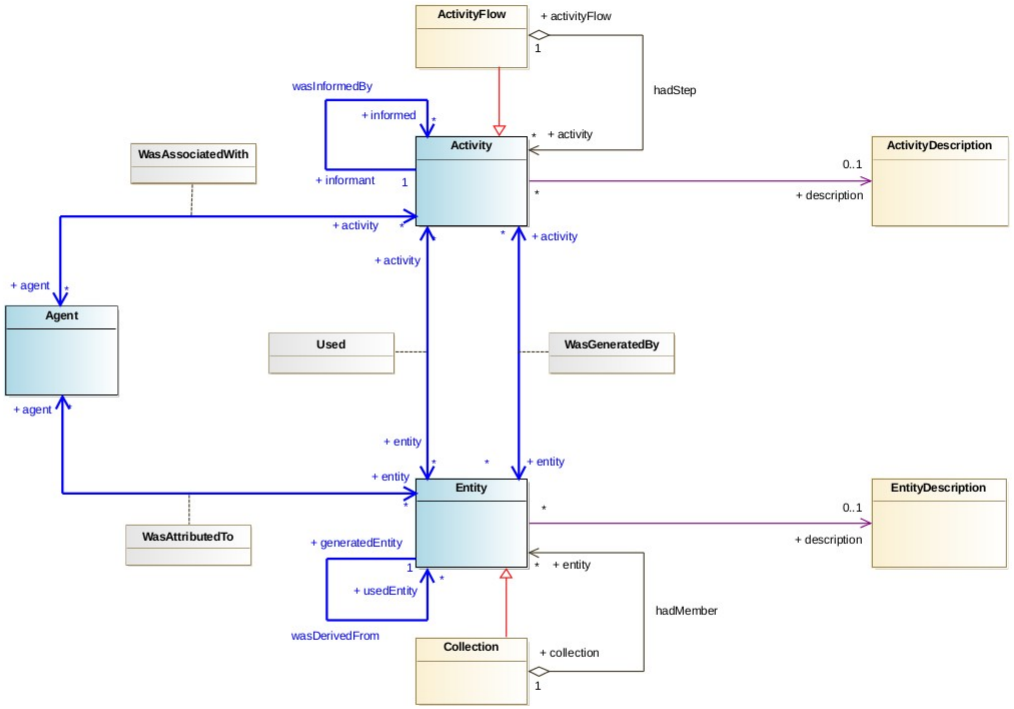


Figure 3: Overview of the classes for the Provenance Data Model in a conceptual class diagram. The blue classes are core elements. There are a number of many-to-many relationships with attached association classes (grey) that may contain additional attributes.

Provenance UML diagram

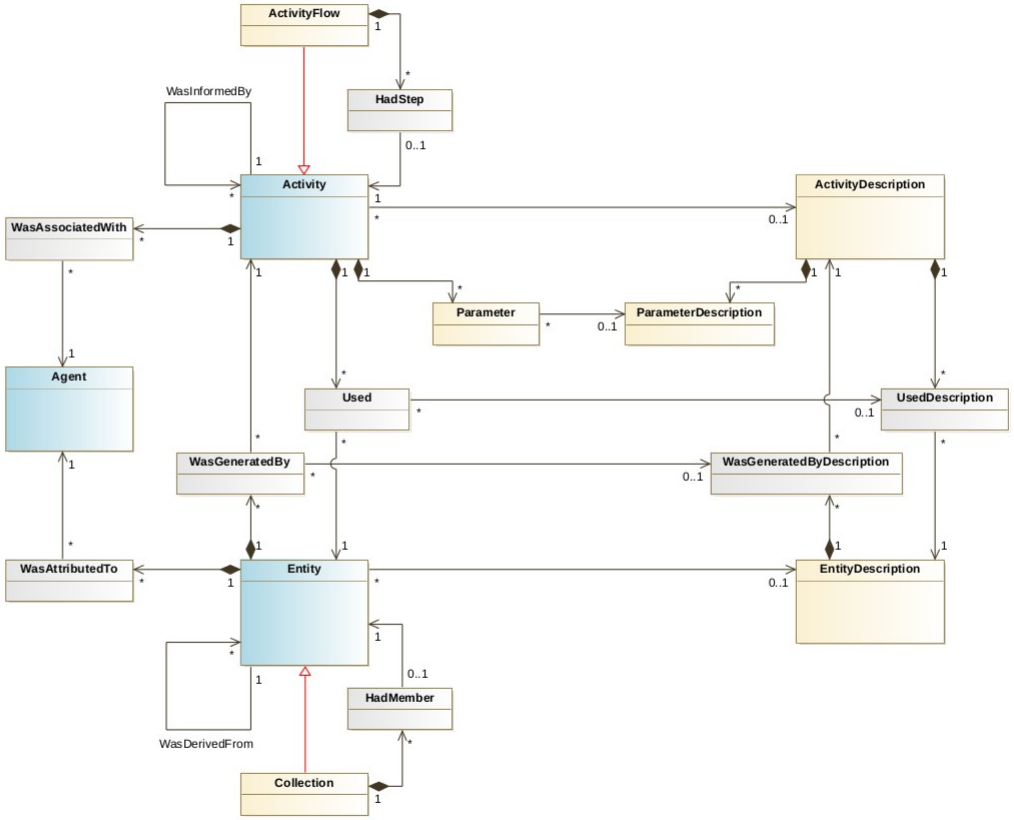


Figure 5: More detailed overview of the classes for the Provenance Data Model. Note that this UML class diagram is compatible with VO-DML.

CDS ProvTAP service project

- It’s a TAP service
- It implements a relational view of the model in its TAP schema
- It allows selection of related entity, activity and agent details by constraining any of the model classes attributes

What has been done so far ?

- Spring 2017: A prototype of a postgresql database has been developed and is regularly updated
  - Original work by a student
  - Based on aladin image collections and activities
  - Use cases : schmidt plate digitizations, cutouts, RGB composition, HiPS generation
  - W3C PROV and VOTable I/O, interface
  - --→ TAP interface « first light » (last week!!!)

What has been done so far ?

- Various « ActivityDescriptions » in the service
  - RGB image generation
  - CDS cutout extraction
  - STScI Schmidt plate numerisation
  - MAMA Schmidt plate numerisation
  - CDS HiPS generation

    -HiPS is a global (allsky) organisation of the image data

    -stored in Healpix cells,

    -retrievable at various Healpix orders

From Schmidt plates to RGB images through digitized plates and cutouts

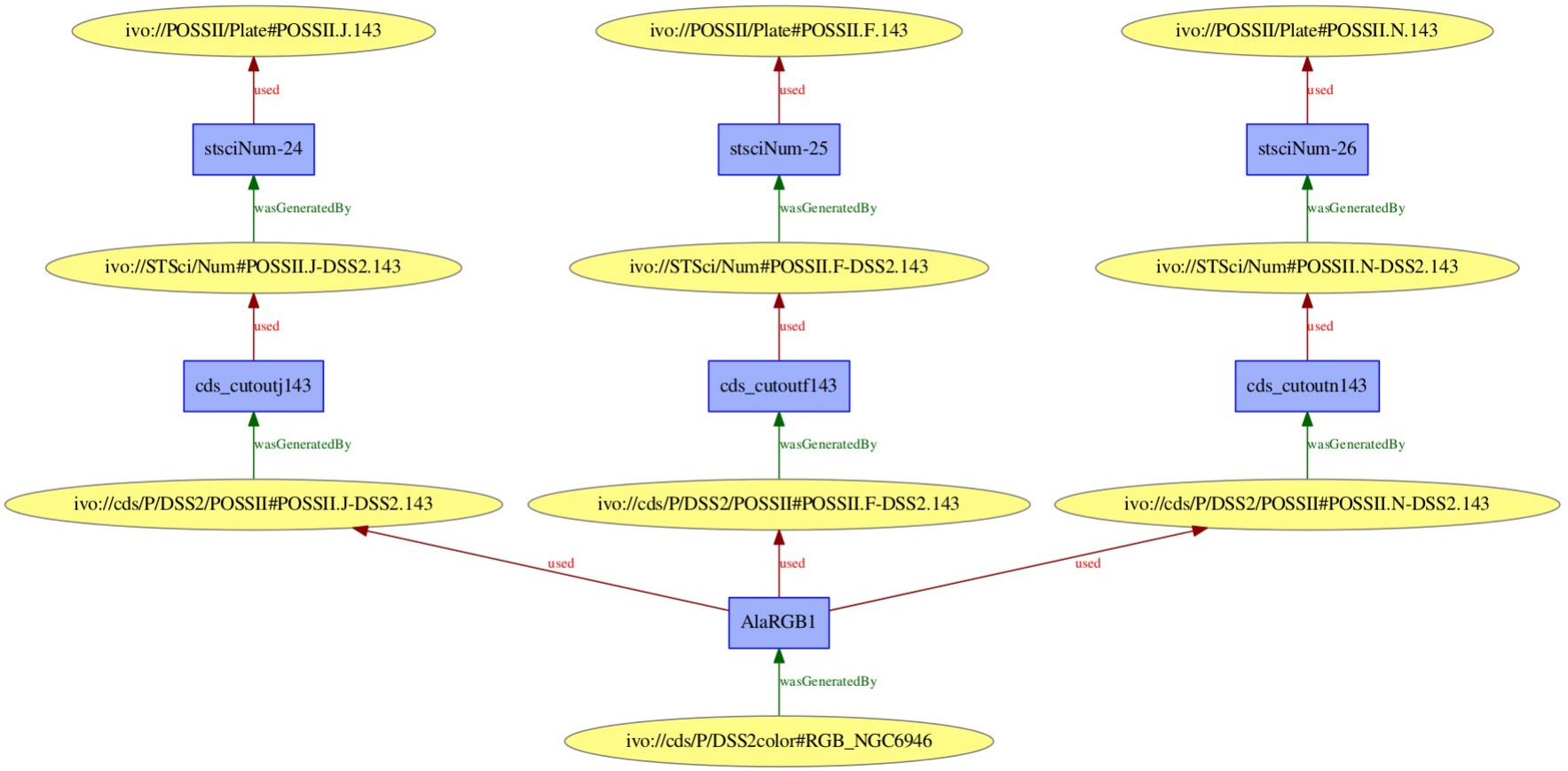
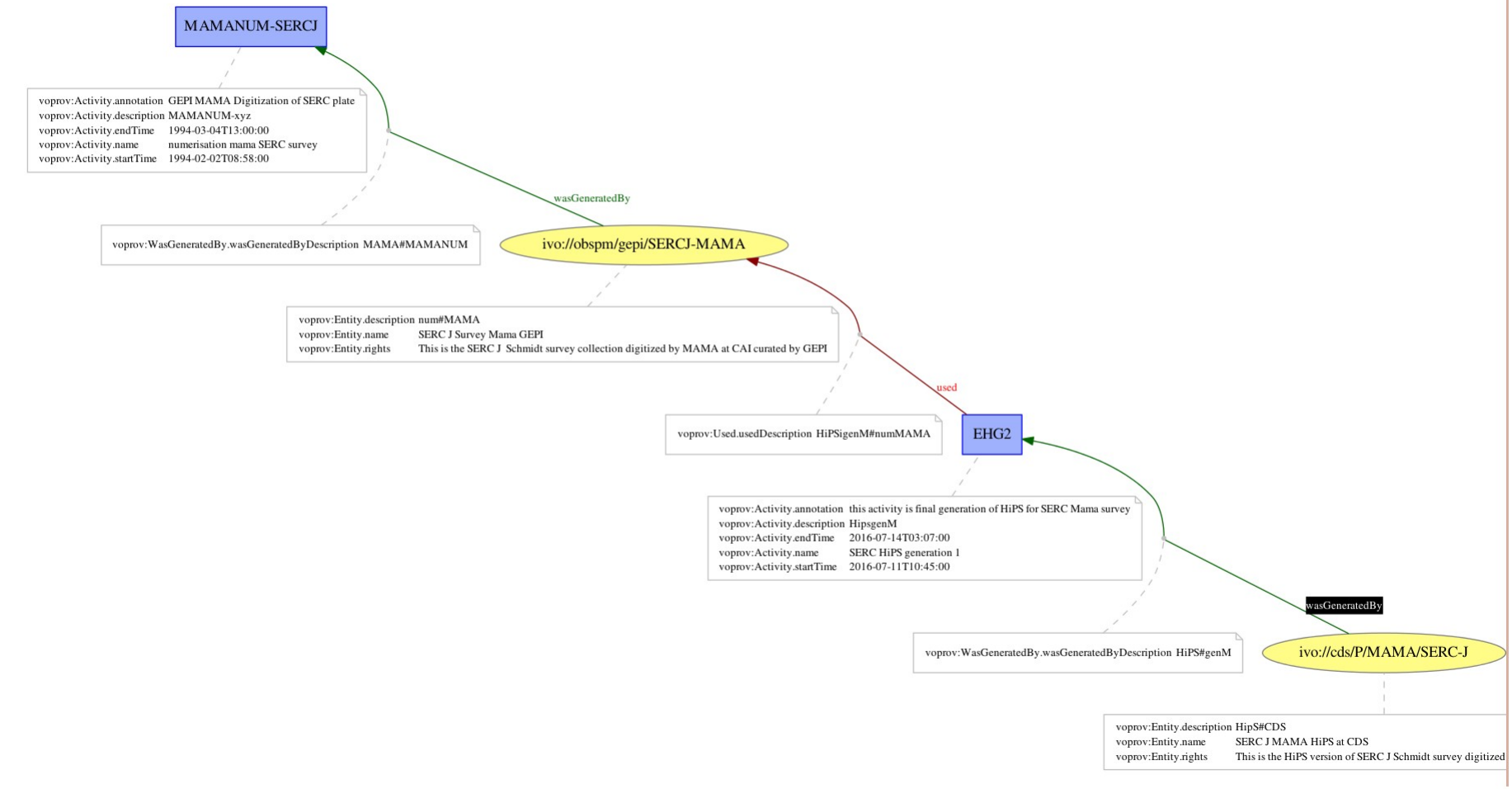


Plate collection digitization
HiPS generation



What has been done so far ?

- Classes and columns description in the ProvTAP specification

Column descriptions

Name	ucd	utype	datatype
e_id	meta.id	voprov:Entity.id	char
e_name	meta.title	voprov:Entity.name	char
e_type	meta.code.class	voprov:Entity.type	char
e_rights	meta.code.class	voprov:Entity.rights	char
e_annotation	meta.description	voprov:Entity.annotation	char
→ e_hadMember	meta.code.member	voprov:Entity.hadMember	char
→ e_description	meta.id	voprov:Entity.description	char
→ e_usedEntity	meta.id	voprov:Entity.wasDerivedFrom.usedEntity	char

Table 2: Column description for Entity table

Name	ucd	utype	datatype
ed_id	meta.id	voprov:EntityDescription.id	char
ed_name	meta.title	voprov:EntityDescription.name	char
ed_annotation	meta.description	voprov:EntityDescription.annotation	char
ed_category	meta.code.class	voprov:EntityDescription.category	char
ed_doculink	meta.ref.url	voprov:EntityDescription.doculink	char

Table 3: Column description for EntityDescription table

Column descriptions

Name	ucd	utype	datatype
a_id	meta.id	voprov:Activity.id	char
a_name	meta.title	voprov:Activity.name	char
a_startTime	time.start	voprov:Activity.startTime	char
a_endTime	time.stop	voprov:Activity.endTime	char
a_annotation	meta.description	voprov:Activity.annotation	char
a_votype	meta.code.class	voprov:Activity.votype	char
→ a_hadStep	meta.code.member	voprov:Activity.hadStep	char
→ a_description	meta.id	voprov:Activity.description	char
→ a_parameter	meta.id	voprov:Activity.parameter	char
→ a_informant	meta.id	voprov:Activity.wasInformedBy.informant	char

Table 4: Column description for Activity table

Name	ucd	utype	datatype
ad_id	meta.id	voprov:ActivityDescription.id	char
ad_name	meta.title	voprov:ActivityDescription.name	char
ad_type	meta.code.class	voprov:ActivityDescription.type	char
ad_subtype	meta.code.class	voprov:ActivityDescription.subtype	char
ad_annotation	meta.description	voprov:ActivityDescription.annotation	char
ad_doculink	meta.ref.url	voprov:ActivityDescription.doculink	char
→ ad_param	meta.id	voprov:ActivityDescription.parameter	char

Table 5: Column description for ActivityDescription table

What has been done so far ?

- Classes and columns description in the ProvTAP specification
- TAP schema designed

Entity in the TAP Schema

```
▼<schema>
  <name>provenance</name>
  <description>Provenance schema</description>
 ▼<table type="output">
    <name>Entity</name>
    <description>instances of Entity class</description>
   ▼<column>
      <name>e_id</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.id</ucd>
      <utype>voprov:Entity.id</utype>
    </column>
   ▼<column>
      <name>e_name</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.title</ucd>
      <utype>voprov:Entity.name</utype>
    </column>
   ▼<column>
      <name>e_type</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.code.class</ucd>
      <utype>voprov:Entity.type</utype>
    </column>
   ▼<column>
      <name>e_rights</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.code.class</ucd>
      <utype>voprov:Entity.rights</utype>
    </column>
   ▼<column>
      <name>e_annotation</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.description</ucd>
      <utype>voprov:Entity.annotation</utype>
    </column>
   ▼<column>
      <name>e_hadMember</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.code.member</ucd>
      <utype>voprov:Entity.hadMember</utype>
    </column>
   ▼<column>
      <name>e_description</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.id</ucd>
      <utype>voprov:Entity.description</utype>
    </column>
   ▼<foreignKey>
      <targetTable>EntityDescription</targetTable>
     ▼<fkColumn>
        <fromColumn>e_description</fromColumn>
        <targetColumn>ed_id</targetColumn>
      </fkColumn>
    </foreignKey>
  </table>
▼<table type="output">
```

Activity in ProvTAP schema

```
▼<table type="output">
  <name>Activity</name>
  <description>instances of Activity class</description>
 ▼<column>
    <name>a_id</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.id</ucd>
    <utype>voprov:Activity.id</utype>
  </column>
 ▼<column>
    <name>a_name</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.title</ucd>
    <utype>voprov:Activity.name</utype>
  </column>
 ▼<column>
    <name>a_startTime</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>time.start</ucd>
    <utype>voprov:Activity.startTime</utype>
  </column>
 ▼<column>
    <name>a_stopTime</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>time.stop</ucd>
    <utype>voprov:Activity.stopTime</utype>
  </column>
 ▼<column>
    <name>a_annotation</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.description</ucd>
    <utype>voprov:Activity.annotation</utype>
  </column>
 ▼<column>
    <name>a_votype</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.code.class</ucd>
    <utype>voprov:Activity.votype</utype>
  </column>
 ▼<column>
    <name>a_hadStep</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.code.member</ucd>
    <utype>voprov:Activity.hadStep</utype>
  </column>
 ▼<column>
    <name>a_description</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.id</ucd>
    <utype>voprov:Activity.description</utype>
  </column>
 ▼<column>
    <name>a_parameter</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.id</ucd>
    <utype>voprov:Activity.parameter</utype>
  </column>
```

What has been done so far ?

- Classes and columns description in the ProvTAP specification
- TAP schema designed
- Specification ready to go to Working draft status

ProvTAP Working draft (to be released soon)

IVOA Provenance Table Access Protocol (ProvTAP)

Version 1.0

IVOA Working Draft 2018-03-22

Working group
DM

This version
http://www.ivoa.net/documents/ProvTAP/20180322

Latest version
http://www.ivoa.net/documents/ProvTAP

Previous versions

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What has been done so far ?

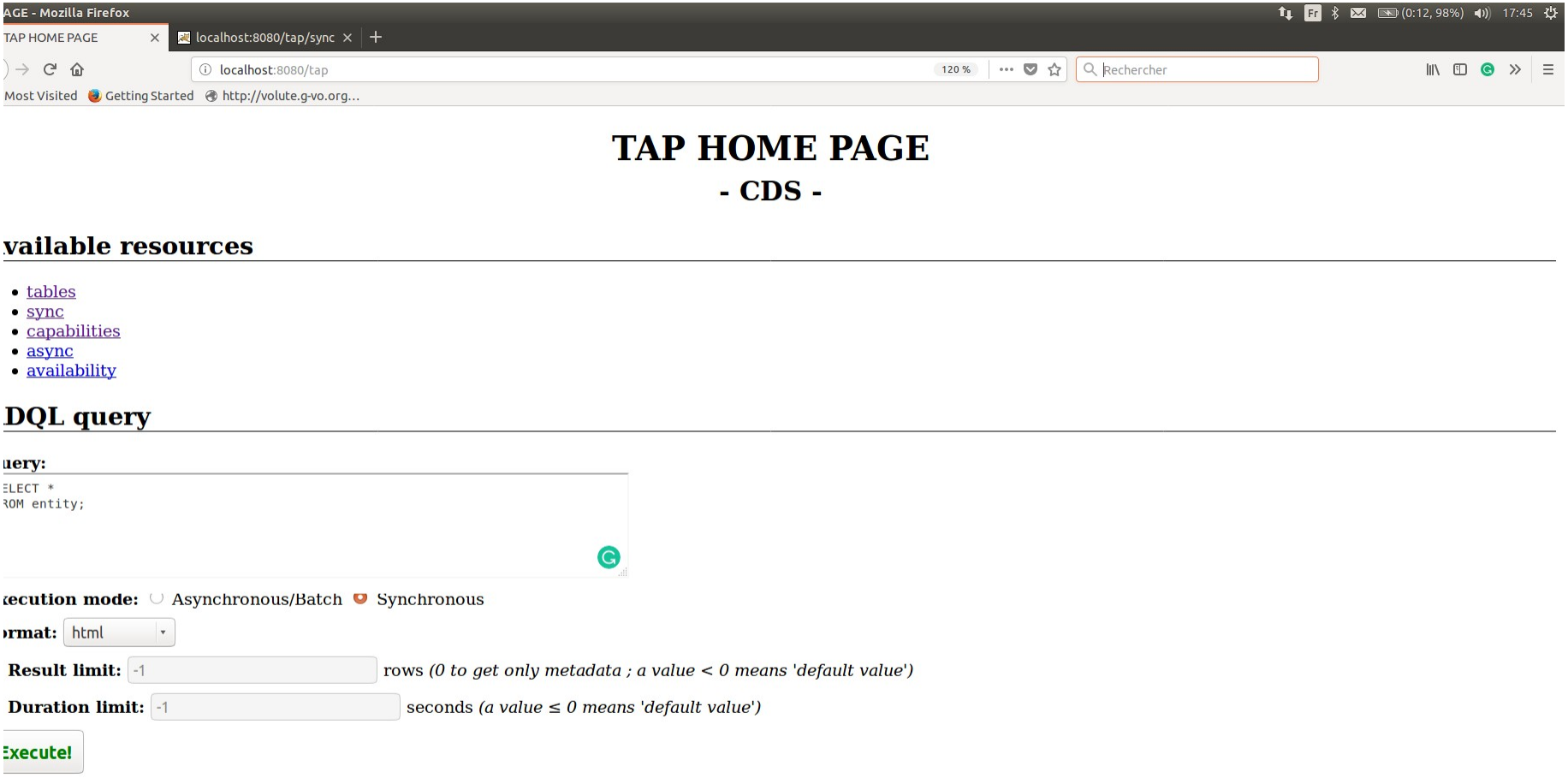
- Classes and columns description in the ProvTAP specification
- TAP schema designed
- Can specification go to Working draft status ?

  → depend from model achievment
  →coauthors review is needed
- Service can be queried via ADQL queries

Implementation tools/status

- Gregory Mantelet's library : easy creation of service on top of database
- Embedded web interface
- Topcat demonstration
- Aladin and TapHandle don't work in current context (my desktop implementation wifi IP numbers not recognized)
- But SAMP communication can help us.
- We created a « miniobscore » table in addition to describe more are « dataset » entities

web interface embedded In TAP library



SELECT * from entity
HTML format

TAP result from CDS on 2018-08-30T15:42:13Z

*SELECT * FROM entity;*

e_id	e_name	e_type	e_rights	e_annotation	e_description
ivo://cds/P/DSS2color#RGB_NGC6946	RGB DSS2 image for NGC 6946			This is a PNG RGB image built from DSS2 with Aladin for galaxy NGC 69	color#RGB
ivo://cds/P/DSS2color#RGB_M101	RGB DSS2 image for Messier 101			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 101	color#RGB
ivo://cds/P/DSS2color#RGB_M33	RGB DSS2 image for Messier 33			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 33	color#RGB
ivo://cds/P/DSS2color#RGB_M51	RGB DSS2 image for Messier 51			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 51	color#RGB
ivo://cds/P/DSS2color#RGB_M81	RGB DSS2 image for Messier 81			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 81	color#RGB
ivo://cds/P/DSS2color#RGB_M83	RGB DSS2 image for Messier 83			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 83	color#RGB
ivo://cds/P/DSS2color#RGB_M87	RGB DSS2 image for Messier 87			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 87	color#RGB
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.061	POSSII Infra Red Survey DSS2 M81			This is the DSS2 digitization of the POSSII Schmidt survey around Messier 81	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.061	POSSII Blue Survey DSS2 M81			This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 81	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.061	POSSII Red Survey DSS2 M81			This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 81	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.143	POSSII Blue Survey DSS2 NGC6946			This is the DSS2 digitization of the Blue POSSII Schmidt survey around NGC 6946	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.143	POSSII Red Survey DSS2 NGC6946			This is the DSS2 digitization of the Red POSSII Schmidt survey around NGC 6946	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.143	POSSII Infra Red Survey DSS2 NGC6946			This is the DSS2 digitization of the Infra red POSSII Schmidt survey around NGC 6946	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.174	POSSII Blue Survey DSS2 M101			This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 101	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.174	POSSII Red Survey DSS2 M101			This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 101	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.175	POSSII Infra Red Survey DSS2 M101			This is the DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 101	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.270	POSSII Blue Survey DSS2 M51			This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 51	cutout#DSS2_MAMA

SELECT * from activity
CSV format

sync ×

```
_id,a_name,a_starttime,a_endtime,a_annotation,a_description
stsciNum-21","Num DSS2 POSSII 061 J","2006-06-29T15:32:50","2006-06-29T15:35:00","DSS2 Digitization of plates at Stsci POSSII 061 J","stsciNum"
stsciNum-22","Num DSS2 POSSII 061 F","2006-04-04T16:39:18","2006-04-04T16:41:00","DSS2 Digitization of plates at Stsci POSSII 061 F","stsciNum"
stsciNum-23","Num DSS2 POSSII 061 N","2006-04-04T16:52:00","2006-04-04T16:54:00","DSS2 Digitization of plates at Stsci POSSII 061 N","stsciNum"
AlaRGB1","Aladin RGB 1","2017-04-18T17:28:00","2017-04-19T17:29:00","Aladin RGB image generation for NGC 6946 ","AlaRGB"
AlaRGB2","Aladin RGB 2","2017-04-18T17:34:00","2017-04-19T17:35:00","Aladin RGB image generation for Messier 101 ","AlaRGB"
AlaRGB3","Aladin RGB 3","2017-04-18T17:41:00","2017-04-19T17:42:00","Aladin RGB image generation for Messier 33 ","AlaRGB"
AlaRGB4","Aladin RGB 4","2017-04-18T17:45:00","2017-04-19T17:46:00","Aladin RGB image generation for Messier 51 ","AlaRGB"
AlaRGB5","Aladin RGB 5","2017-04-18T17:47:00","2017-04-19T17:48:00","Aladin RGB image generation for Messier 81 ","AlaRGB"
AlaRGB6","Aladin RGB 6","2017-04-18T17:50:00","2017-04-19T17:51:00","Aladin RGB image generation for Messier 83 ","AlaRGB"
AlaRGB7","Aladin RGB 7","2017-04-18T17:53:00","2017-04-19T17:54:00","Aladin RGB image generation for Messier 87 ","AlaRGB"
stsciNum-24","Num DSS2 POSSII 143 J","2006-04-04T16:10:12","2006-04-04T16:10:30","DSS2 Digitization of plates at Stsci POSSII 143 J","stsciNum"
stsciNum-25","Num DSS2 POSSII 143 F","2006-04-04T16:25:45","2006-04-04T16:25:55","DSS2 Digitization of plates at Stsci POSSII 143 F","stsciNum"
stsciNum-26","Num DSS2 POSSII 143 N","2006-04-04T16:31:01","2006-04-04T16:31:21","DSS2 Digitization of plates at Stsci POSSII 143 N","stsciNum"
stsciNum-27","Num DSS2 POSSII 270 J","2006-04-04T16:17:26","2006-04-04T16:17:36","DSS2 Digitization of plates at Stsci POSSII 270 J","stsciNum"
stsciNum-28","Num DSS2 POSSII 270 F","2006-04-04T16:17:27","2006-04-04T16:17:37","DSS2 Digitization of plates at Stsci POSSII 270 F","stsciNum"
stsciNum-29","Num DSS2 POSSII 270 N","2006-04-04T16:35:11","2006-04-04T16:35:21","DSS2 Digitization of plates at Stsci POSSII 270 N","stsciNum"
stsciNum-2a","Num DSS2 POSSII 174 J","2006-04-04T16:36:03","2006-04-04T16:36:13","DSS2 Digitization of plates at Stsci POSSII 174 J","stsciNum"
stsciNum-2b","Num DSS2 POSSII 174 F","2006-04-04T16:22:28","2006-04-04T16:22:38","DSS2 Digitization of plates at Stsci POSSII 174 F","stsciNum"
stsciNum-2c","Num DSS2 POSSII 175 N","2006-04-04T16:41:00","2006-04-04T16:41:10","DSS2 Digitization of plates at Stsci POSSII 175 N","stsciNum"
stsciNum-2d","Num DSS2 POSSII 413 J","2006-04-04T16:19:43","2006-04-04T16:19:53","DSS2 Digitization of plates at Stsci POSSII 413 J","stsciNum"
stsciNum-2e","Num DSS2 POSSII 413 F","2006-04-04T16:18:05","2006-04-04T16:18:15","DSS2 Digitization of plates at Stsci POSSII 413 F","stsciNum"
stsciNum-2f","Num DSS2 POSSII 413 N","2006-06-29T15:32:42","2006-06-29T15:32:52","DSS2 Digitization of plates at Stsci POSSII 413 N","stsciNum"
stsciNum-2g","Num DSS2 POSSII 644 J","2006-04-04T16:07:36","2006-04-04T16:07:46","DSS2 Digitization of plates at Stsci POSSII 644 J","stsciNum"
stsciNum-2h","Num DSS2 POSSII 644 F","2006-04-04T16:11:58","2006-04-04T16:12:08","DSS2 Digitization of plates at Stsci POSSII 644 F","stsciNum"
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stsciNum-2j","Num DSS2 SERC 445 I","2006-04-04T16:36:09","2006-04-04T16:36:19","DSS2 Digitization of plates at Stsci SERC 445 I","stsciNum"
MAMANUM-1","numerisation mama SERC J 444","1994-02-04T09:00:00","1994-02-04T14:57:00","GEPI MAMA Digitization of plate SERC 444J","MAMANUM-xyz"
MAMANUM-2","numerisation mama ESO R 444","1994-01-28T09:03:00","1994-01-28T13:07:00","GEPI MAMA Digitization of plate ESO 444R","MAMANUM-xyz"
MAMANUM-3","numerisation mama ESO R 445","1993-08-12T09:17:00","1993-08-12T13:32:00","GEPI MAMA Digitization of plate ESO 445R","MAMANUM-xyz"
MAMANUM-4","numerisation mama ESO R 446","1993-08-13T09:13:00","1993-08-13T13:25:00","GEPI MAMA Digitization of plate ESO 446R","MAMANUM-xyz"
MAMANUM-5","numerisation mama ESO R 447","1993-08-14T08:58:00","1993-08-14T13:00:00","GEPI MAMA Digitization of plate ESO 447R","MAMANUM-xyz"
MAMANUM-ESOR","numerisation mama ESO survey","1993-08-01T08:58:00","1993-08-31T13:00:04","GEPI MAMA Digitization of  ESO plates","MAMANUM-xyz"
MAMANUM-SERCJ","numerisation mama SERC survey","1994-02-02T08:58:00","1994-03-04T13:00:00","GEPI MAMA Digitization of SERC plate","MAMANUM-xyz"
cds_cutoutj061","Cut out Aladin POSSII 061 J","2017-04-18T16:33:00","2017-04-19T16:34:00","Cut out CDS- soda service POSSII 061 J","cds_cutout"
cds_cutoutf061","Cut out Aladin POSSII 061 F","2017-04-18T16:34:00","2017-04-19T16:35:00","Cut out CDS- soda service POSSII 061 F","cds_cutout"
cds_cutoutn061","Cut out Aladin POSSII 061 N","2017-04-18T16:35:00","2017-04-19T16:36:00","Cut out CDS- soda service POSSII 061 N","cds_cutout"
cds_cutoutj143","Cut out Aladin POSSII 143 J","2017-04-18T16:36:00","2017-04-19T16:37:00","Cut out CDS- soda service POSSII 143 J","cds_cutout"
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cds_cutoutj270","Cut out Aladin POSSII 270 J","2017-04-18T16:42:00","2017-04-19T16:42:30","Cut out CDS- soda service POSSII 270 J","cds_cutout"
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cds_cutoutf413","Cut out Aladin POSSII 143 F","2017-04-18T16:46:00","2017-04-19T16:46:30","Cut out CDS- soda service POSSII 143 F","cds_cutout"
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cds_cutoutj644","Cut out Aladin POSSII 644 J","2017-04-18T16:48:00","2017-04-19T16:48:25","Cut out CDS- soda service POSSII 644 J","cds_cutout"
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cds_cutouti445","Cut out Aladin SERC 445 I","2017-04-18T16:52:00","2017-04-19T16:52:20","Cut out CDS- soda service SERC 445 I","cds_cutout"
cds_cutouti444","Cut out Aladin SERC 444 J","2017-04-18T16:54:00","2017-04-19T16:54:20","Cut out CDS- soda service SERC 444 J","cds_cutout"
```
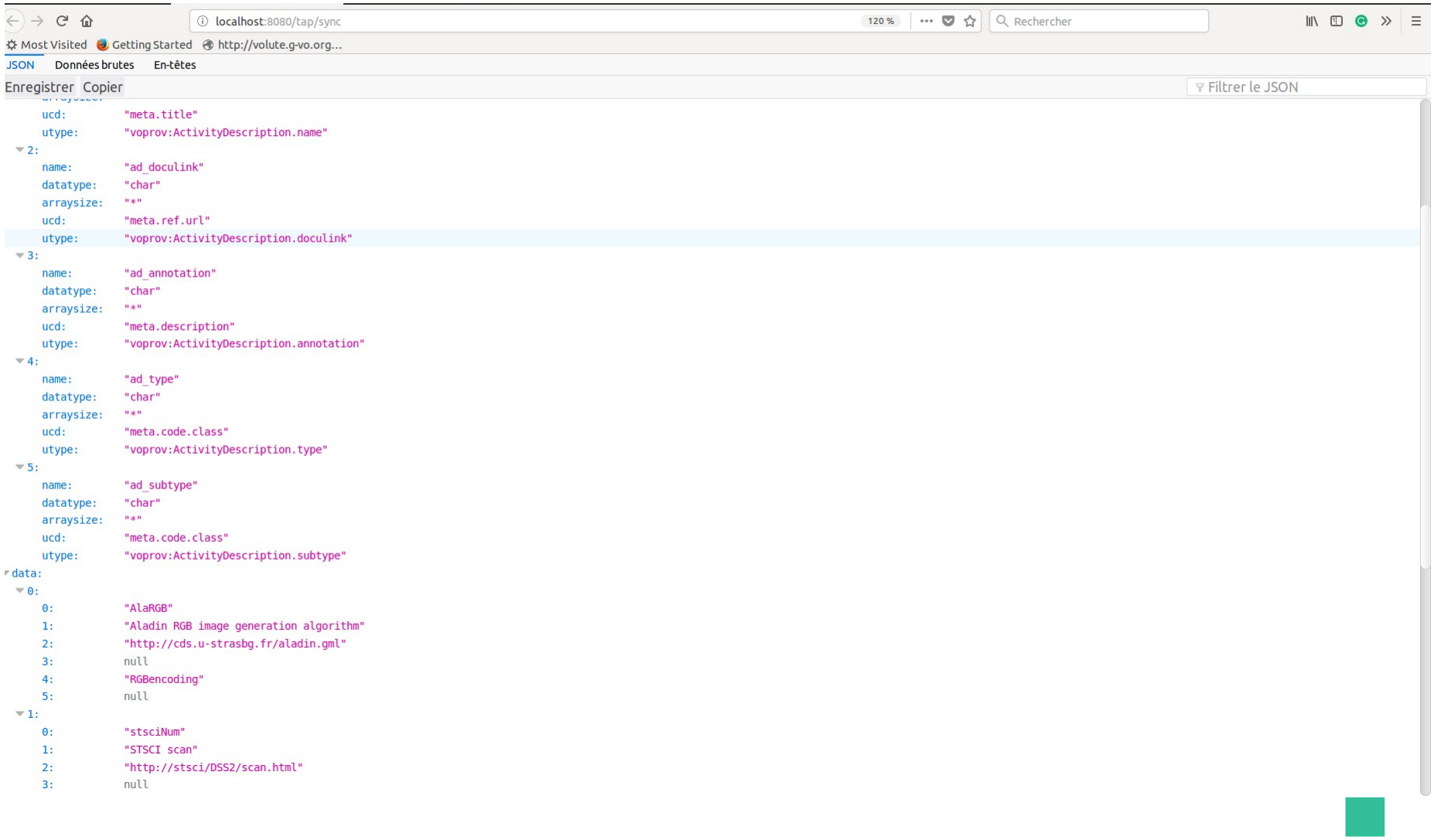

Texte brut ▾ Largeur des tabulations : 8 ▾ Lig 11, Col 114 INS

SELECT * from activitydescription

json format



SELECT * from miniobscore
VOTable format

```
sync-I
<?xml version="1.0" encoding="utf-8"?>
<VOTABLE version="1.3" xmlns="http://www.ivoa.net/xml/VOTable/v1.3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.ivoa.net/xml/VOTable/v1.3 http://www.ivoa.net/xml/
VOTable/v1.3">
<RESOURCE type="results">
<INFO name="QUERY_STATUS" value="OK"/>
<INFO name="PROVIDER" value="CDS"></INFO>
<INFO name="QUERY" value="SELECT *
FROM miniobscore;"/>
<TABLE name="result_S1535644387945">
<FIELD arraysize="*" datatype="char" name="obs_publisher_did" ucd="meta.ref.ivoid" utype="obscore:Curation.publisherDID"/>
<FIELD arraysize="*" datatype="char" name="access_url" ucd="meta.ref.url" utype="obscore:Access.reference"/>
<FIELD arraysize="*" datatype="char" name="data_rights" ucd="meta.code.class" utype="obscore:Curation.rights"/>
<FIELD arraysize="*" datatype="char" name="dataproduct_type" ucd="meta.code.class" utype="obscore:ObsDataSet.dataProductype"/>
<FIELD datatype="int" name="calib_level" ucd="meta.code;obs.calib" utype="obscore:ObsDataSet.caliblevel"/>
<DATA>
<TABLEDATA>
 <TR>
   <TD>ivo://cds/P/MAMA/SERC-J</TD>
   <TD>http://alasky.u-strasbg.fr/MAMA/CDS_P_MAMA_srcj</TD>
   <TD>public</TD>
   <TD>hips</TD>
   <TD>3</TD>
 </TR>
 <TR>
   <TD>ivo://cds/P/MAMA/ESO-R</TD>
   <TD>http://alasky.u-strasbg.fr/MAMA/CDS_P_MAMA_esor</TD>
   <TD>public</TD>
   <TD>hips</TD>
   <TD>3</TD>
 </TR>
 <TR>
   <TD>ivo://cds/P/DSS2color#RGB_NGC6946</TD>
   <TD>file://home/bonnarel/Aladin/RGB/RGB_NGC6946.png</TD>
   <TD>public</TD>
   <TD>image</TD>
   <TD>3</TD>
 </TR>
 <TR>
   <TD>ivo://cds/P/DSS2color#RGB_M101</TD>
   <TD>file://home/bonnarel/Aladin/RGB/RGB_M101.png</TD>
   <TD>public</TD>
   <TD>image</TD>
   <TD>3</TD>
 </TR>
 <TR>
   <TD>ivo://cds/P/DSS2color#RGB_M33</TD>
   <TD>file://home/bonnarel/Aladin/RGB/RGB_M33.png</TD>
   <TD>public</TD>
   <TD>image</TD>
   <TD>3</TD>
 </TR>
 <TR>
   <TD>ivo://cds/P/DSS2color#RGB_M51</TD>
   <TD>file://home/bonnarel/Aladin/RGB/RGB_M51.png</TD>

XML ▾  Largeur des tabulations : 8 ▾  Lig 9, Col 120  INS
```

More realistic (and complex) queries

- To retrieve all activity metadata for activies sharing the same activityDescription:

```
SELECT * FROM Activity WHERE Activity.a_description = 'HipsgenM'
```

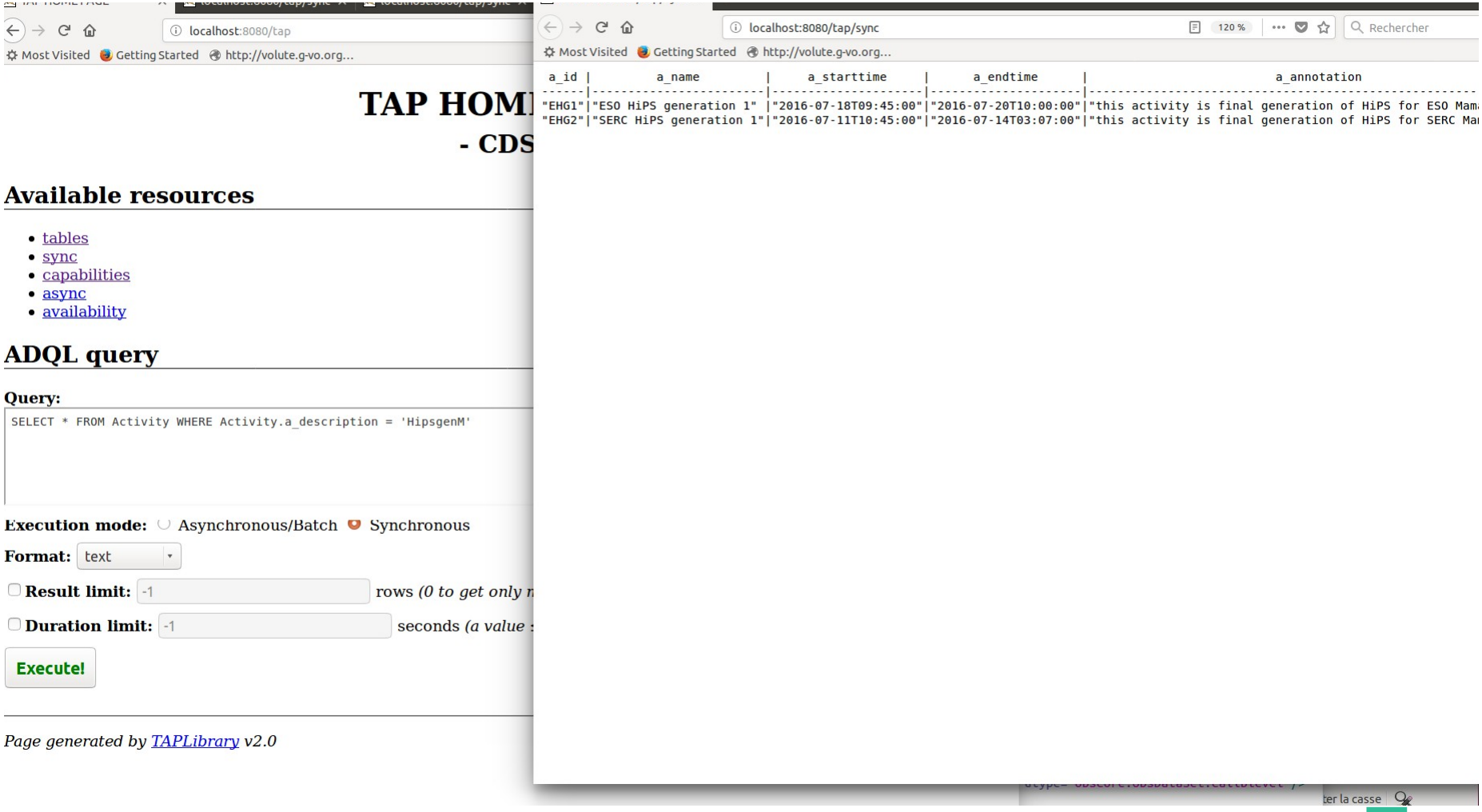
- To retrieve all activities associated with agent obspm:

```
SELECT WasAssociatedWith.waw_activity_id, Activity.a_name,
    Activity.a_annotation FROM WasAssociatedWith INNER JOIN Activity
    ON WasAssociatedWith.waw_activity_id = Activity.a_id WHERE
    WasAssociatedWith.waw_agent_id = 'ivo://obspm/cai'
```

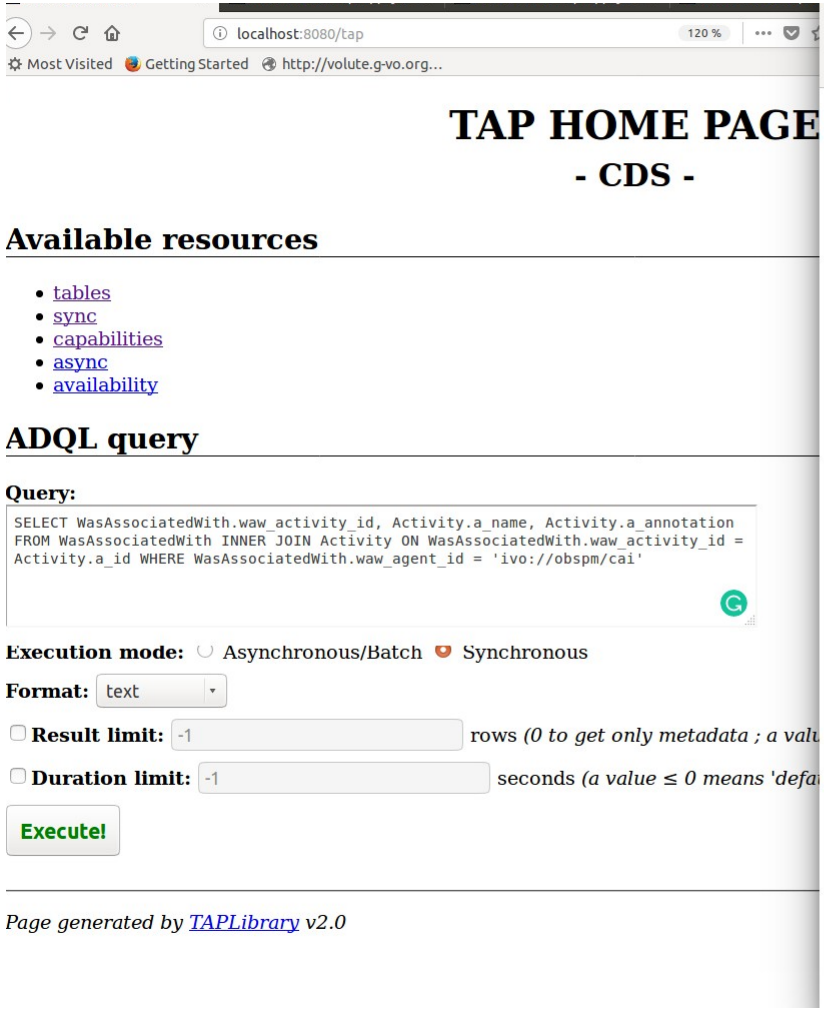
- To retrieve all entities attributed to curator agents:

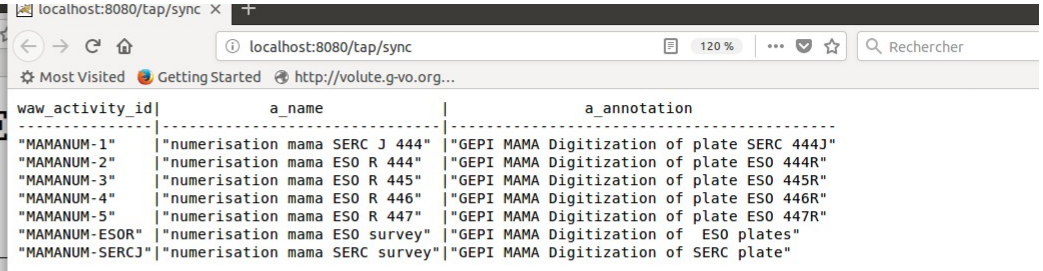
```
SELECT WasAttributedTo.wat_entity_id FROM WasAttributedTo
    WHERE WasAttributedTo.wat_role = 'voprov :curator'
```

Activities sharing the same activity description « HipsgenM »

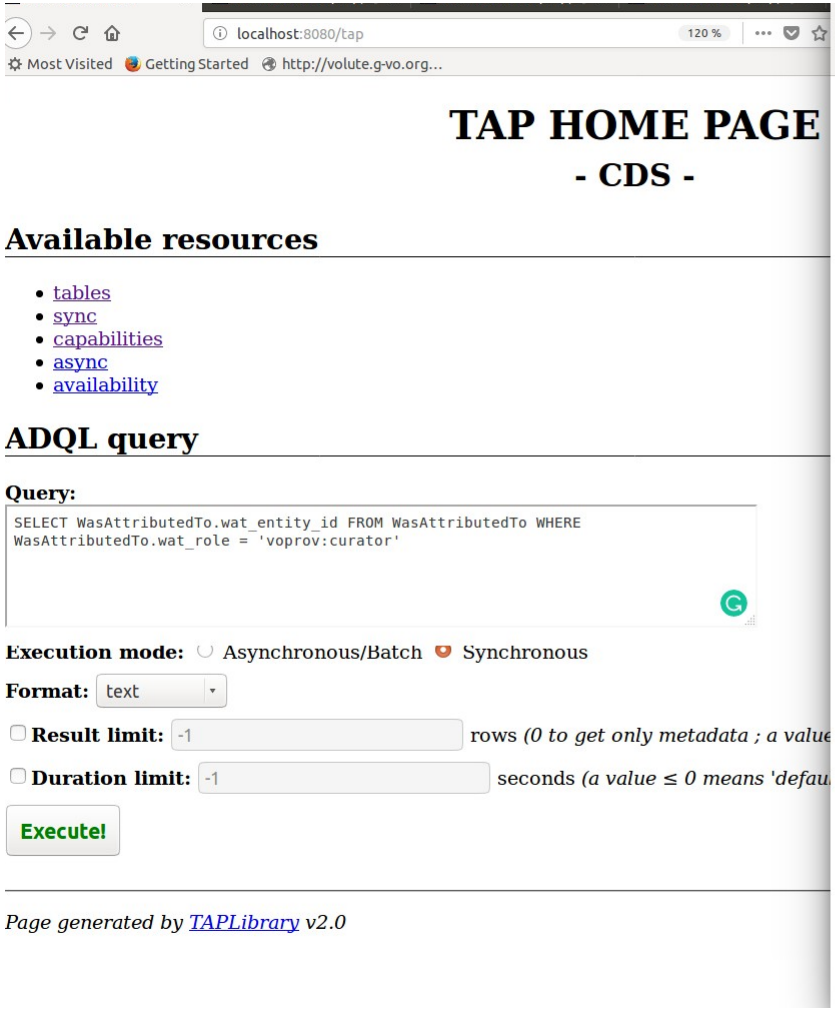


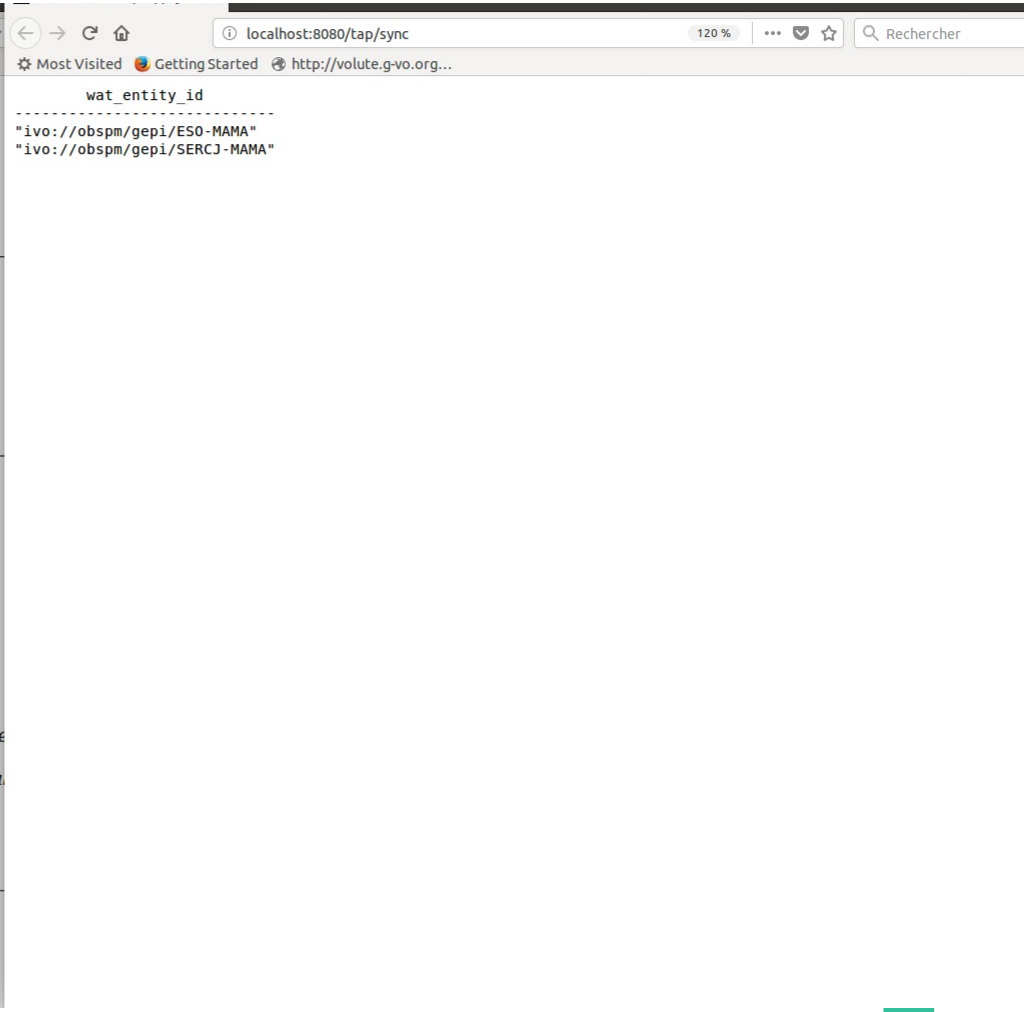
Activities associated with agent « ivo://obspm/cai »



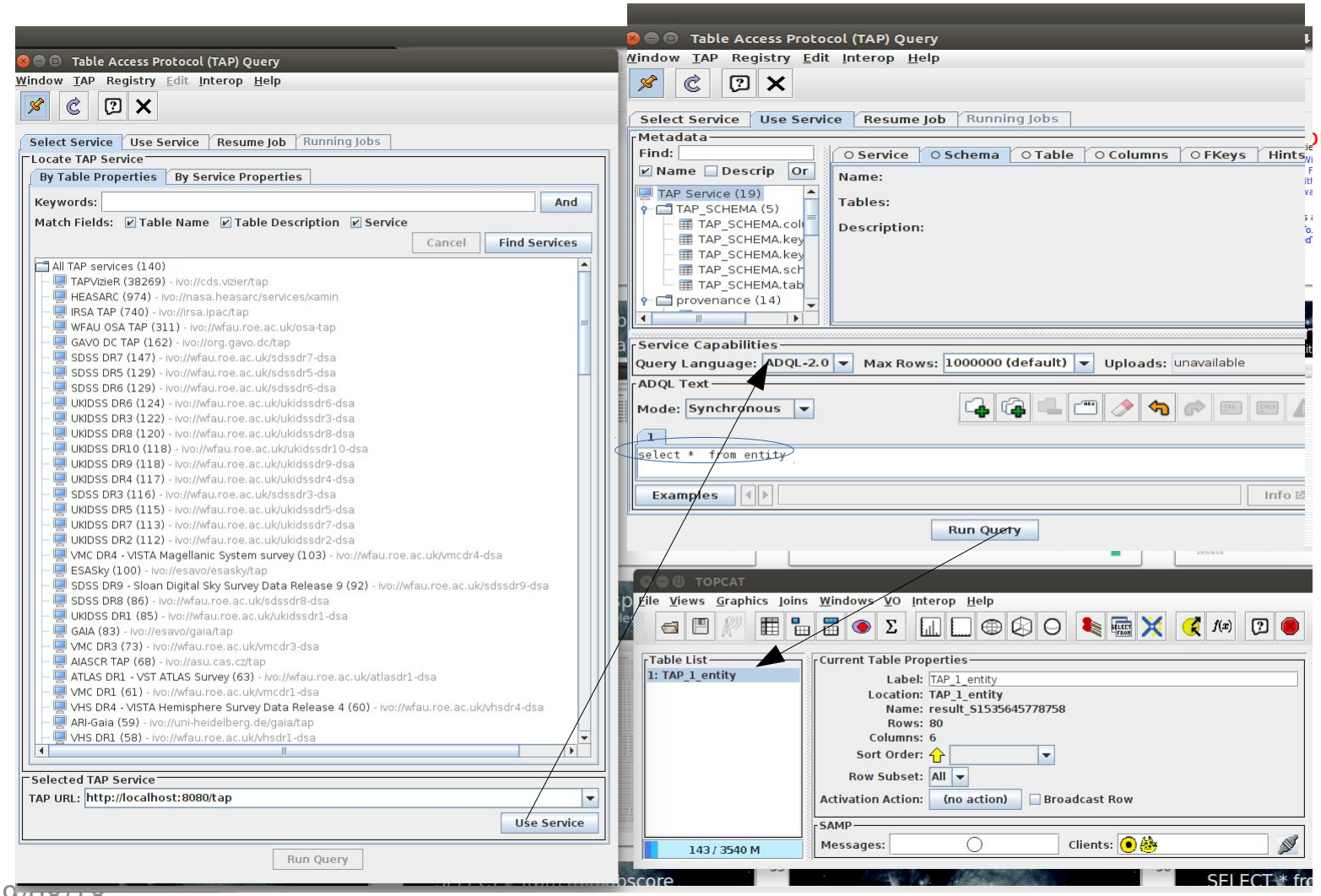


Entities attributed to agents with role « voprov:curator »





Querying service with TopCat



Service response

(list of entities. ADQL : select * from Entity)

ble Browser for 1: entity.xml

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ivo://cds/P/DSS2color#RGB_M101	RGB DSS2 image for Messier 101		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 101		color#RGB
ivo://cds/P/DSS2color#RGB_M33	RGB DSS2 image for Messier 33		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 33		color#RGB
ivo://cds/P/DSS2color#RGB_M51	RGB DSS2 image for Messier 51		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 51		color#RGB
ivo://cds/P/DSS2color#RGB_M81	RGB DSS2 image for Messier 81		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 81		color#RGB
ivo://cds/P/DSS2color#RGB_M83	RGB DSS2 image for Messier 83		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 83		color#RGB
ivo://cds/P/DSS2color#RGB_M87	RGB DSS2 image for Messier 87		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 87		color#RGB
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.061	POSSII Infra Red Survey DSS2 M81		This is the DSS2 digitization of the POSSII Schmidt survey around Messier 81		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.061	POSSII Blue Survey DSS2 M81		This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 81		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.061	POSSII Red Survey DSS2 M81		This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 81		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.143	POSSII Blue Survey DSS2 NGC6946		This is the DSS2 digitization of the Blue POSSII Schmidt survey around NGC 6946		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.143	POSSII Red Survey DSS2 NGC6946		This is the DSS2 digitization of the Red POSSII Schmidt survey around NGC 6946		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.143	POSSII Infra Red Survey DSS2 NGC6946		This is the DSS2 digitization of the Infra red POSSII Schmidt survey around NGC 6946		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.174	POSSII Blue Survey DSS2 M101		This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 101		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.174	POSSII Red Survey DSS2 M101		This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 101		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.175	POSSII Infra Red Survey DSS2 M101		This is the DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 101		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.270	POSSII Blue Survey DSS2 M51		This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 51		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.270	POSSII Red Survey DSS2 M51		This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 51		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.270	POSSII Infra Red Survey DSS2 M51		This is the DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 51		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.413	POSSII Blue Survey DSS2 M33		This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 33		cutout#DSS2_MAMA
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ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.413	POSSII Infra Red Survey DSS2 M33		This is the DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 33		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.644	POSSII Blue Survey DSS2 M87		This is the cut-out DSS2 digitization of the Blue POSSII Schmidt survey around Messier 87		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.644	POSSII Red Survey DSS2 M87		This is the cut-out DSS2 digitization of the Red POSSII Schmidt survey around Messier 87		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.644	POSSII Infra Red Survey DSS2 M87		This is the cut-out DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 87		cutout#DSS2_MAMA
ivo://cds/P/DSS2/SERC#SERC.I-DSS2.445	SERC Infra Red Survey DSS2 M83		This is the DSS2 digitization of the Infra REd SERC Schmidt survey around Messier 83		cutout#DSS2_MAMA
ivo://cds/P/MAMA/SERC#SERC.J-MAMA.444	SERC Blue Survey MAMA M83		This is the MAMA digitization of the blue SERC Schmidt survey around Messier 83		cutout#DSS2_MAMA
ivo://cds/P/MAMA/ESO#ESO.R-MAMA.444	ESO Infra Red Survey MAMA M83		This is the MAMA digitization of the Red MAMA Schmidt survey around Messier 83		cutout#DSS2_MAMA
ivo://STSci/Num#POSSII.J-DSS2.061	POSSII Blue Survey DSS2 061		This is the DSS2 digitization of the Blue POSSII Schmidt survey plate 061		num#DSS2
ivo://STSci/Num#POSSII.F-DSS2.061	POSSII Red Survey DSS2 061		This is the DSS2 digitization of the Red POSSII Schmidt survey around plate 061		num#DSS2
ivo://STSci/Num#POSSII.N-DSS2.061	POSSII Infra Red Survey DSS2 061		This is the DSS2 digitization of the Infra Red POSSII Schmidt survey plate 061		num#DSS2
ivo://STSci/Num#POSSII.J-DSS2.143	POSSII Blue Survey DSS2 143		This is the DSS2 digitization of the Blue POSSII Schmidt survey around plate 143		num#DSS2
ivo://STSci/Num#POSSII.F-DSS2.143	POSSII Red Survey DSS2 143		This is the DSS2 digitization of the Red POSSII Schmidt survey around plate 143		num#DSS2
ivo://STSci/Num#POSSII.N-DSS2.143	POSSII Infra Red Survey DSS2 143		This is the DSS2 digitization of the Infra red POSSII Schmidt survey plate 143		num#DSS2
ivo://STSci/Num#POSSII.J-DSS2.174	POSSII Blue Survey DSS2 174		This is the DSS2 digitization of the Blue POSSII Schmidt survey around plate 174		num#DSS2
ivo://STSci/Num#POSSII.F-DSS2.174	POSSII Red Survey DSS2 174		This is the DSS2 digitization of the Red POSSII Schmidt survey plate 174		num#DSS2
ivo://STSci/Num#POSSII.N-DSS2.175	POSSII Infra Red Survey DSS2 M101		This is the DSS2 digitization of the Infra red POSSII Schmidt survey plate 175		num#DSS2
ivo://STSci/Num#POSSII.J-DSS2.270	POSSII Blue Survey DSS2 270		This is the DSS2 digitization of the Blue POSSII Schmidt survey plate 270		num#DSS2
ivo://STSci/Num#POSSII.F-DSS2.270	POSSII Red Survey DSS2 270		This is the DSS2 digitization of the Red POSSII Schmidt survey plate 270		num#DSS2
ivo://STSci/Num#POSSII.N-DSS2.270	POSSII Infra Red Survey DSS2 270		This is the DSS2 digitization of the Infra red POSSII Schmidt survey plate 270		num#DSS2
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ivo://STSci/Num#POSSII.F-DSS2.413	POSSII Red Survey DSS2 413		This is the DSS2 digitization of the Red POSSII Schmidt survey plate 413		num#DSS2
ivo://STSci/Num#POSSII.N-DSS2.413	POSSII Infra Red Survey DSS2 413		This is the DSS2 digitization of the Infra red POSSII Schmidt survey plate 413		num#DSS2
ivo://STSci/Num#POSSII.J-DSS2.644	Digital POSSII plate Blue Survey DSS2 644		This is the numerical plate of the Blue POSSII Schmidt survey		num#DSS2
ivo://STSci/Num#POSSII.F-DSS2.644	Digital POSSII plate Red Survey DSS2 644		This is the numerical plate of the Red POSSII Schmidt survey around Messier 87		num#DSS2
ivo://STSci/Num#POSSII.N-DSS2.644	Digital POSSII plate Infra Red Survey DSS2 644		This is the numerical plate of the Infra red POSSII Schmidt survey around Messier 87		num#DSS2
ivo://STSci/Num#SERC.I-DSS2.445	Digital SERC plate Infra Red Survey DSS2 445		This is the numerical plate of the Infra red SERC Schmidt survey for plate 445		num#DSS2
ivo://gepi/MAMA/Num#SERC.J-MAMA.444	SERC J Survey MAMA plate 444		This is the MAMA digitization of the blue SERC Schmidt plate 444		num#MAMA
ivo://gepi/MAMA/Num#ESO.R-MAMA.444	ESO Red Survey MAMA plate 444		This is the MAMA digitization of the Red MAMA Schmidt plate 444		num#MAMA
ivo://gepi/MAMA/Num#ESO.R-MAMA.445	ESO Red Survey MAMA plate 445		This is the MAMA digitization of the Red MAMA Schmidt plate 445		num#MAMA
ivo://gepi/MAMA/Num#ESO.R-MAMA.446	ESO Red Survey MAMA plate 446		This is the MAMA digitization of the Red MAMA Schmidt plate 446		num#MAMA
ivo://gepi/MAMA/Num#ESO.R-MAMA.447	ESO Red Survey MAMA plate 447		This is the MAMA digitization of the Red MAMA Schmidt plate 447		num#MAMA
ivo://POSSII/Plate#POSSII.J.644	POSSII plate Blue Survey DSS2 plate 644		This is the plate of the Blue POSSII Schmidt survey plate 644		Plate#POSSII
ivo://POSSII/Plate#POSSII.F.644	POSSII plate Red Survey DSS2 plate 644		This is the plate of the Red POSSII Schmidt survey plate 644		Plate#POSSII
ivo://POSSII/Plate#POSSII.N.644	POSSII plate Infra Red Survey DSS2 plate 644		This is plate of the Infra red POSSII Schmidt survey plate 644		Plate#POSSII
ivo://POSSII/Plate#POSSII.N.061	POSSII Infra Red Survey DSS2 plate 644		This is the DSS2 digitization of the Infra Red POSSII Schmidt survey plate 061		Plate#POSSII
ivo://POSSII/Plate#POSSII.J.061	POSSII Blue Survey DSS2 plate 061		This is the DSS2 digitization of the Blue POSSII Schmidt survey plate 061		Plate#POSSII
ivo://POSSII/Plate#POSSII.F.061	POSSII Red Survey DSS2 061		This is the DSS2 digitization of the Red POSSII Schmidt survey around plate 061		Plate#POSSII

Service response
(list of activities . ADQL : select * from Activity)

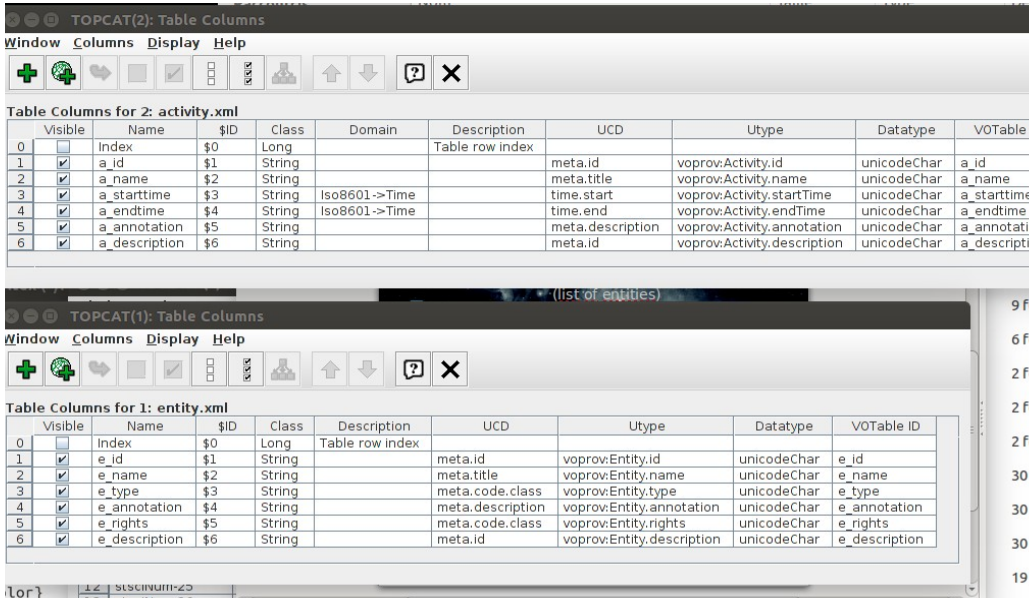
Table Browser

dow Subsets Help

ble Browser for 2: activity.xml

a_id	a_name	a_starttime	a_endtime	a_annotation	a_description
AlaRGB1	Aladin RGB 1	2017-04-18T17:28:00	2017-04-19T17:29:00	Aladin RGB image generation for NGC 6946	AlaRGB
AlaRGB2	Aladin RGB 2	2017-04-18T17:34:00	2017-04-19T17:35:00	Aladin RGB image generation for Messier 101	AlaRGB
AlaRGB3	Aladin RGB 3	2017-04-18T17:41:00	2017-04-19T17:42:00	Aladin RGB image generation for Messier 33	AlaRGB
AlaRGB4	Aladin RGB 4	2017-04-18T17:45:00	2017-04-19T17:46:00	Aladin RGB image generation for Messier 51	AlaRGB
AlaRGB5	Aladin RGB 5	2017-04-18T17:47:00	2017-04-19T17:48:00	Aladin RGB image generation for Messier 81	AlaRGB
AlaRGB6	Aladin RGB 6	2017-04-18T17:50:00	2017-04-19T17:51:00	Aladin RGB image generation for Messier 83	AlaRGB
AlaRGB7	Aladin RGB 7	2017-04-18T17:53:00	2017-04-19T17:54:00	Aladin RGB image generation for Messier 87	AlaRGB
stsciNum-21	Num DSS2 POSSII 061 J	2006-06-29T15:32:50		DSS2 Digitization of plates at Stsci POSSII 061 J	stsciNum
stsciNum-22	Num DSS2 POSSII 061 F	2006-04-04T16:39:18		DSS2 Digitization of plates at Stsci POSSII 061 F	stsciNum
stsciNum-23	Num DSS2 POSSII 061 N	2006-04-04T16:52:00		DSS2 Digitization of plates at Stsci POSSII 061...	stsciNum
stsciNum-24	Num DSS2 POSSII 143 J	2006-04-04T16:10:12	2006-04-04T16:10:30	DSS2 Digitization of plates at Stsci POSSII 143 J	stsciNum
stsciNum-25	Num DSS2 POSSII 143 F	2006-04-04T16:25:45	2006-04-04T16:25:55	DSS2 Digitization of plates at Stsci POSSII 143 F	stsciNum
stsciNum-26	Num DSS2 POSSII 143 N	2006-04-04T16:31:01	2006-04-04T16:31:21	DSS2 Digitization of plates at Stsci POSSII 143...	stsciNum
stsciNum-27	Num DSS2 POSSII 270 J	2006-04-04T16:17:26	2006-04-04T16:17:36	DSS2 Digitization of plates at Stsci POSSII 270 J	stsciNum
stsciNum-28	Num DSS2 POSSII 270 F	2006-04-04T16:17:27	2006-04-04T16:17:37	DSS2 Digitization of plates at Stsci POSSII 270 F	stsciNum
stsciNum-29	Num DSS2 POSSII 270 N	2006-04-04T16:35:11	2006-04-04T16:35:21	DSS2 Digitization of plates at Stsci POSSII 270...	stsciNum
stsciNum-2a	Num DSS2 POSSII 174 J	2006-04-04T16:36:03	2006-04-04T16:36:13	DSS2 Digitization of plates at Stsci POSSII 174 J	stsciNum
stsciNum-2b	Num DSS2 POSSII 174 F	2006-04-04T16:22:28	2006-04-04T16:22:38	DSS2 Digitization of plates at Stsci POSSII 174 F	stsciNum
stsciNum-2c	Num DSS2 POSSII 175 N	2006-04-04T16:41:00	2006-04-04T16:41:10	DSS2 Digitization of plates at Stsci POSSII 175...	stsciNum
stsciNum-2d	Num DSS2 POSSII 413 J	2006-04-04T16:19:43	2006-04-04T16:19:53	DSS2 Digitization of plates at Stsci POSSII 413 J	stsciNum
stsciNum-2e	Num DSS2 POSSII 413 F	2006-04-04T16:18:05	2006-04-04T16:18:15	DSS2 Digitization of plates at Stsci POSSII 413 F	stsciNum
stsciNum-2f	Num DSS2 POSSII 413 N	2006-06-29T15:32:42	2006-06-29T15:32:52	DSS2 Digitization of plates at Stsci POSSII 413...	stsciNum
stsciNum-2g	Num DSS2 POSSII 644 J	2006-04-04T16:07:36	2006-04-04T16:07:46	DSS2 Digitization of plates at Stsci POSSII 644 J	stsciNum
stsciNum-2h	Num DSS2 POSSII 644 F	2006-04-04T16:11:58	2006-04-04T16:12:08	DSS2 Digitization of plates at Stsci POSSII 644 F	stsciNum
stsciNum-2i	Num DSS2 POSSII 644 N	2006-04-04T16:11:58	2006-04-04T16:11:58	DSS2 Digitization of plates at Stsci POSSII 644...	stsciNum
stsciNum-2j	Num DSS2 SERC 445 I	2006-04-04T16:36:09	2006-04-04T16:36:19	DSS2 Digitization of plates at Stsci SERC 445 I	stsciNum
MAMANUM-1	numerisation mama SERC J 444	1994-02-04T09:00:00	1994-02-04T14:57:00	GEPI MAMA Digitization of plate SERC 444J	MAMANUM-xyz
MAMANUM-2	numerisation mama ESO R 444	1994-01-28T09:03:00	1994-01-28T13:07:00	GEPI MAMA Digitization of plate ESO 444R	MAMANUM-xyz
MAMANUM-3	numerisation mama ESO R 445	1993-08-12T09:17:00	1993-08-12T13:32:00	GEPI MAMA Digitization of plate ESO 445R	MAMANUM-xyz
MAMANUM-4	numerisation mama ESO R 446	1993-08-13T09:13:00	1993-08-13T13:25:00	GEPI MAMA Digitization of plate ESO 446R	MAMANUM-xyz
MAMANUM-5	numerisation mama ESO R 447	1993-08-14T08:58:00	1993-08-14T13:00:00	GEPI MAMA Digitization of plate ESO 447R	MAMANUM-xyz
MAMANUM-ESOR	numerisation mama ESO survey	1993-08-01T08:58:00	1993-08-31T13:00:04	GEPI MAMA Digitization of ESO plates	MAMANUM-xyz
MAMANUM-SERCJ	numerisation mama SERC survey	1994-02-02T08:58:00	1994-03-04T13:00:00	GEPI MAMA Digitization of SERC plate	MAMANUM-xyz
cds_cutoutj061	Cut out Aladin POSSII 061 J	2017-04-18T16:33:00	2017-04-19T16:34:00	Cut out CDS- soda service POSSII 061 J	cds_cutout
cds_cutoutf061	Cut out Aladin POSSII 061 F	2017-04-18T16:34:00	2017-04-19T16:35:00	Cut out CDS- soda service POSSII 061 F	cds_cutout
cds_cutoutn061	Cut out Aladin POSSII 061 N	2017-04-18T16:35:00	2017-04-19T16:36:00	Cut out CDS- soda service POSSII 061 N	cds_cutout
cds_cutoutj143	Cut out Aladin POSSII 143 J	2017-04-18T16:36:00	2017-04-19T16:37:00	Cut out CDS- soda service POSSII 143 J	cds_cutout
cds_cutoutf143	Cut out Aladin POSSII 143 F	2017-04-18T16:37:00	2017-04-19T16:38:00	Cut out CDS- soda service POSSII 143 F	cds_cutout
cds_cutoutn143	Cut out Aladin POSSII 143 N	2017-04-18T16:38:00	2017-04-19T16:39:00	Cut out CDS- soda service POSSII 143 N	cds_cutout
cds_cutoutj174	Cut out Aladin POSSII 174 J	2017-04-18T16:39:00	2017-04-19T16:40:00	Cut out CDS- soda service POSSII 174 J	cds_cutout
cds_cutoutf174	Cut out Aladin POSSII 174 F	2017-04-18T16:40:00	2017-04-19T16:41:00	Cut out CDS- soda service POSSII 174 F	cds_cutout
cds_cutoutn175	Cut out Aladin POSSII 175 N	2017-04-18T16:41:00	2017-04-19T16:42:00	Cut out CDS- soda service POSSII 175 N	cds_cutout
cds_cutoutj270	Cut out Aladin POSSII 270 J	2017-04-18T16:42:00	2017-04-19T16:42:30	Cut out CDS- soda service POSSII 270 J	cds_cutout
cds_cutoutf270	Cut out Aladin POSSII 270 F	2017-04-18T16:43:00	2017-04-19T16:43:30	Cut out CDS- soda service POSSII 270 F	cds_cutout
cds_cutoutn270	Cut out Aladin POSSII 270 N	2017-04-18T16:44:00	2017-04-19T16:44:30	Cut out CDS- soda service POSSII 270 N	cds_cutout
cds_cutoutj413	Cut out Aladin POSSII 143 J	2017-04-18T16:45:00	2017-04-19T16:45:30	Cut out CDS- soda service POSSII 143 J	cds_cutout
cds_cutoutf413	Cut out Aladin POSSII 143 F	2017-04-18T16:46:00	2017-04-19T16:46:30	Cut out CDS- soda service POSSII 143 F	cds_cutout
cds_cutoutn413	Cut out Aladin POSSII 143 N	2017-04-18T16:47:00	2017-04-19T16:47:40	Cut out CDS- soda service POSSII 143 N	cds_cutout
cds_cutoutj644	Cut out Aladin POSSII 644 J	2017-04-18T16:48:00	2017-04-19T16:48:25	Cut out CDS- soda service POSSII 644 J	cds_cutout
cds_cutoutf644	Cut out Aladin POSSII 644 F	2017-04-18T16:49:00	2017-04-19T16:49:26	Cut out CDS- soda service POSSII 644 F	cds_cutout
cds_cutoutn644	Cut out Aladin POSSII 644 N	2017-04-18T16:50:00	2017-04-19T16:50:30	Cut out CDS- soda service POSSII 644 N	cds_cutout
cds_cutouti445	Cut out Aladin SERC 445 I	2017-04-18T16:52:00	2017-04-19T16:52:20	Cut out CDS- soda service SERC 445 I	cds_cutout
cds_cutoutj444	Cut out Aladin SERC 444 J	2017-04-18T16:54:00	2017-04-19T16:54:20	Cut out CDS- soda service SERC 444 J	cds_cutout
cds_cutoutr444	Cut out Aladin ESO 444 R	2017-04-18T16:55:00	2017-04-19T16:55:30	Cut out CDS- soda service ESO 444 R	cds_cutout
EHG1	ESO HiPS generation 1	2016-07-18T09:45:00	2016-07-20T10:00:00	this activity is final generation of HiPS for ESO ...	HipsgenM
EHG2	SERC HiPS generation 1	2016-07-11T10:45:00	2016-07-14T03:07:00	this activity is final generation of HiPS for SER...	HipsgenM

Service response (table field attributes)

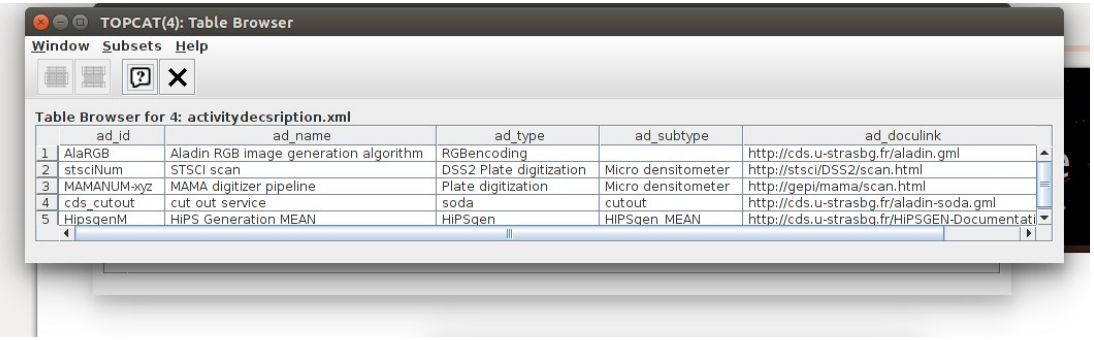


	Visible	Name	$ID	Class	Domain	Description	UCD	Utype	Datatype	VOTable
0	☐	Index	$0	Long		Table row index				
1	☑	a_id	$1	String			meta.id	voprov:Activity.id	unicodeChar	a_id
2	☑	a_name	$2	String			meta.title	voprov:Activity.name	unicodeChar	a_name
3	☑	a_starttime	$3	String	Iso8601->Time		time.start	voprov:Activity.startTime	unicodeChar	a_starttime
4	☑	a_endtime	$4	String	Iso8601->Time		time.end	voprov:Activity.endTime	unicodeChar	a_endtime
5	☑	a_annotation	$5	String			meta.description	voprov:Activity.annotation	unicodeChar	a_annotati
6	☑	a_description	$6	String			meta.id	voprov:Activity.description	unicodeChar	a_descripti

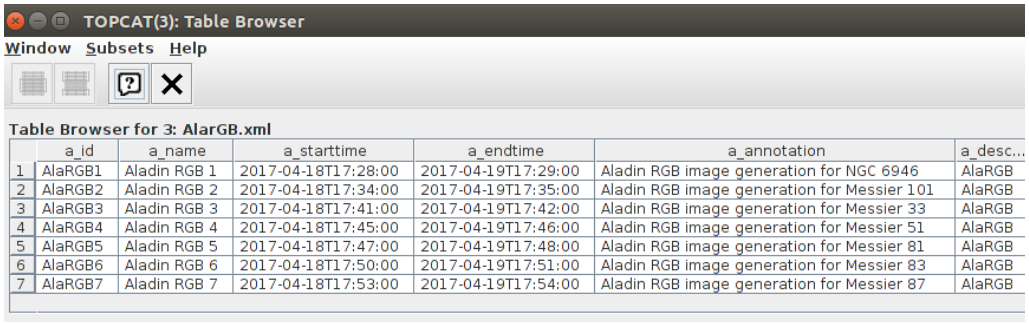
	Visible	Name	$ID	Class	Description	UCD	Utype	Datatype	VOTable ID
0	☐	Index	$0	Long	Table row index				
1	☑	e_id	$1	String		meta.id	voprov:Entity.id	unicodeChar	e_id
2	☑	e_name	$2	String		meta.title	voprov:Entity.name	unicodeChar	e_name
3	☑	e_type	$3	String		meta.code.class	voprov:Entity.type	unicodeChar	e_type
4	☑	e_annotation	$4	String		meta.description	voprov:Entity.annotation	unicodeChar	e_annotation
5	☑	e_rights	$5	String		meta.code.class	voprov:Entity.rights	unicodeChar	e_rights
6	☑	e_description	$6	String		meta.id	voprov:Entity.description	unicodeChar	e_description

Service response

- ADQL : select * from activity where activity.a_description = 'AlaRGB'



	ad_id	ad_name	ad_type	ad_subtype	ad_doculink
1	AlaRGB	Aladin RGB image generation algorithm	RGBencoding		http://cds.u-strasbg.fr/aladin.gml
2	stsciNum	STSCI scan	DSS2 Plate digitization	Micro densitometer	http://stsci/DSS2/scan.html
3	MAMANUM-xyz	MAMA digitizer pipeline	Plate digitization	Micro densitometer	http://gepi/mama/scan.html
4	cds_cutout	cut out service	soda	cutout	http://cds.u-strasbg.fr/aladin-soda.gml
5	HipsgenM	HiPS Generation MEAN	HiPSgen	HIPSgen_MEAN	http://cds.u-strasbg.fr/HiPSGEN-Documentati



	a_id	a_name	a_starttime	a_endtime	a_annotation	a_desc...
1	AlaRGB1	Aladin RGB 1	2017-04-18T17:28:00	2017-04-19T17:29:00	Aladin RGB image generation for NGC 6946	AlaRGB
2	AlaRGB2	Aladin RGB 2	2017-04-18T17:34:00	2017-04-19T17:35:00	Aladin RGB image generation for Messier 101	AlaRGB
3	AlaRGB3	Aladin RGB 3	2017-04-18T17:41:00	2017-04-19T17:42:00	Aladin RGB image generation for Messier 33	AlaRGB
4	AlaRGB4	Aladin RGB 4	2017-04-18T17:45:00	2017-04-19T17:46:00	Aladin RGB image generation for Messier 51	AlaRGB
5	AlaRGB5	Aladin RGB 5	2017-04-18T17:47:00	2017-04-19T17:48:00	Aladin RGB image generation for Messier 81	AlaRGB
6	AlaRGB6	Aladin RGB 6	2017-04-18T17:50:00	2017-04-19T17:51:00	Aladin RGB image generation for Messier 83	AlaRGB
7	AlaRGB7	Aladin RGB 7	2017-04-18T17:53:00	2017-04-19T17:54:00	Aladin RGB image generation for Messier 87	AlaRGB

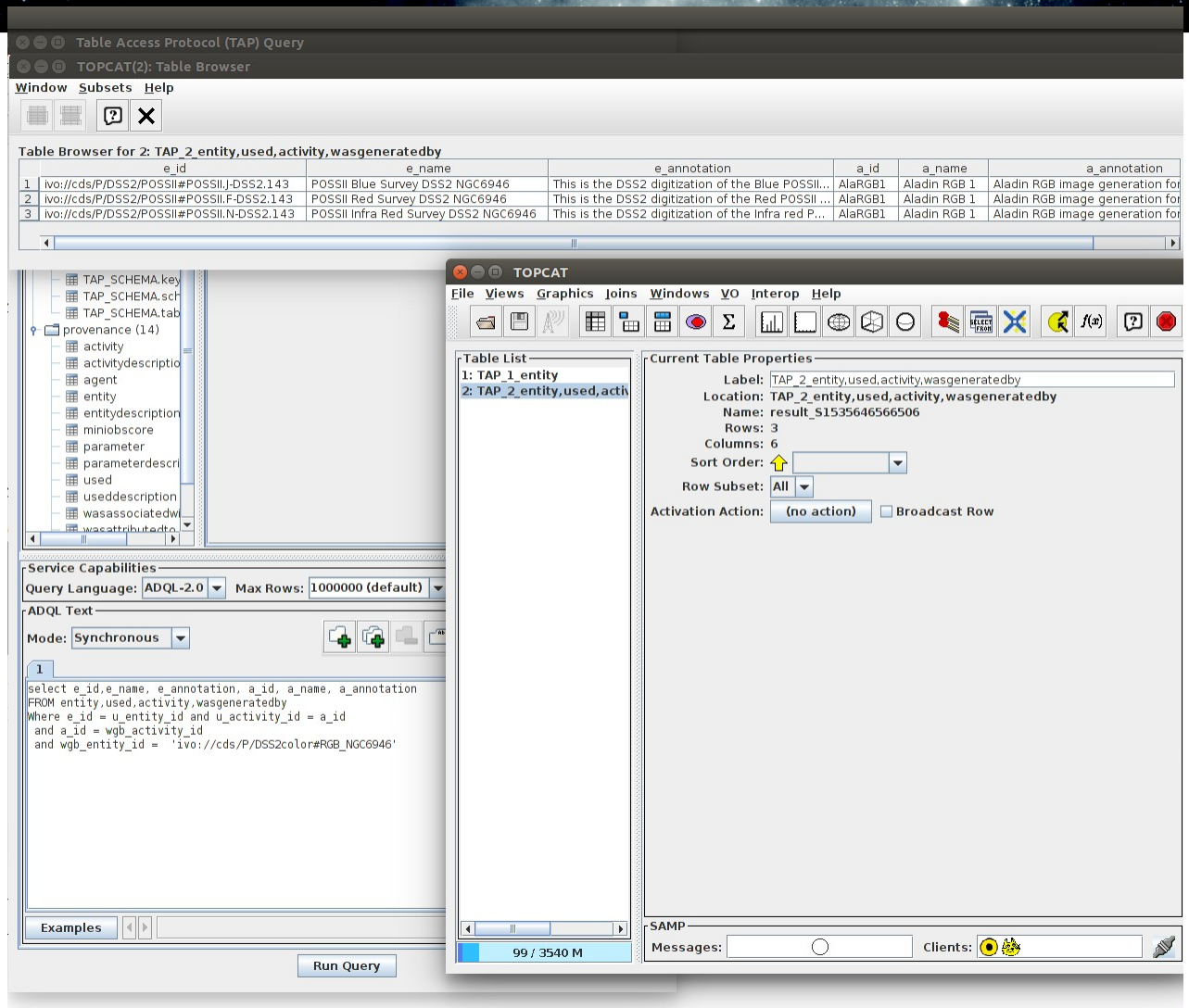
More realistic (and complex) queries

To retrieve entity and activity details metadata for those leading to a given entity 'ivo://cds/P/DSS2color#RGB_NGC6946'

```
select e_id,e_name, e_annotation, a_id, a_name, a_annotation
FROM entity,used,activity,wasgeneratedby
Where e_id = u_entity_id and u_activity_id = a_id
 and a_id = wgb_activity_id
 and wgb_entity_id =  'ivo://cds/P/DSS2color#RGB_NGC6946'
```

« History » of entity

« ivo://cds/P/DSS2color#RGB_NGC6946 »



More realistic (and complex) queries

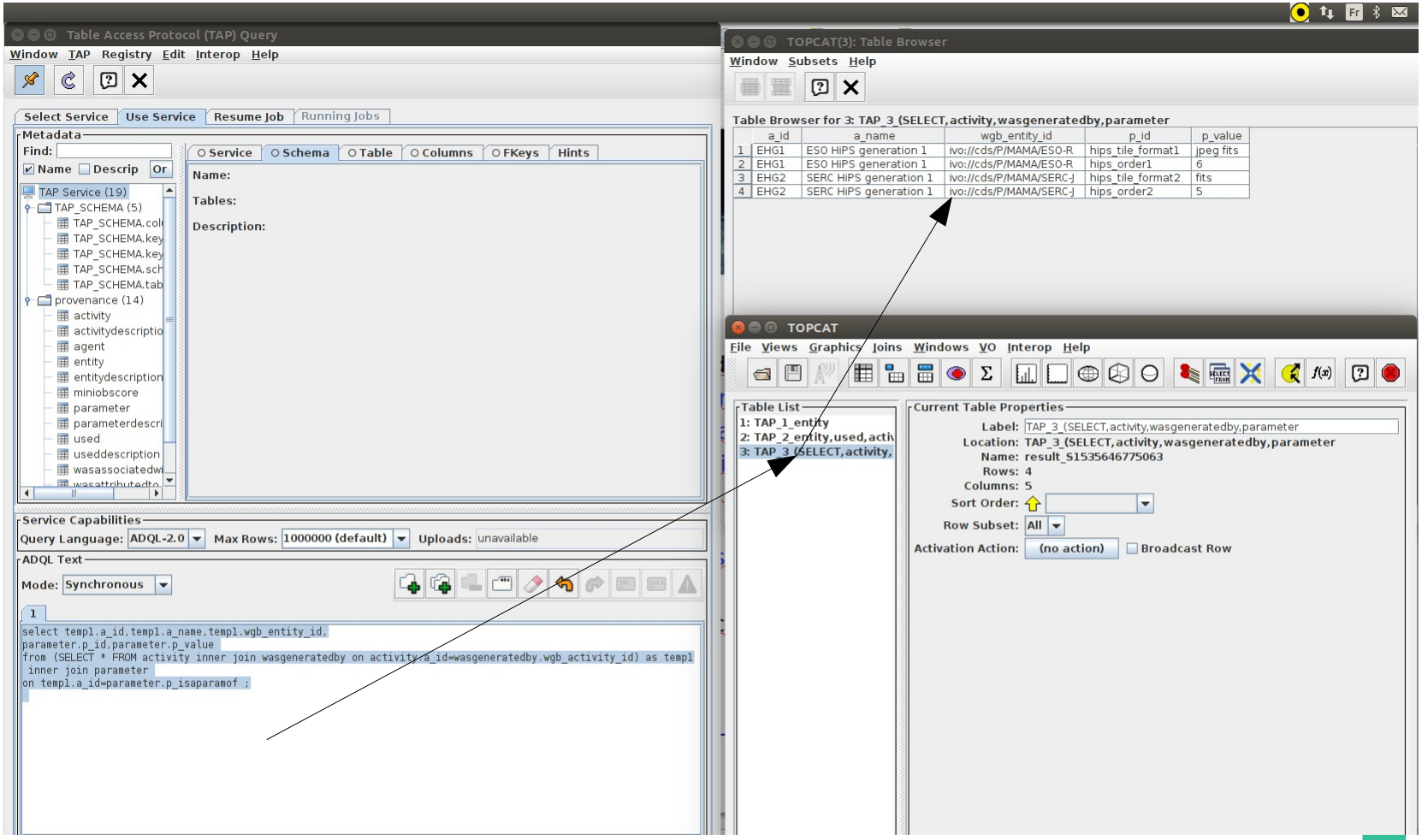
To retrieve activity details and generated entity id using parameters:

```
select temp1.a_id,temp1.a_name,temp1.wgb_entity_id,
parameter.p_id,parameter.p_value
from (SELECT * FROM activity inner join wasgeneratedby on
    activity.a_id=wasgeneratedby.wgb_activity_id) as temp1
 inner join parameter
on temp1.a_id=parameter.p_isaparamof ;
```

To retrieve all entity/obscore combinations

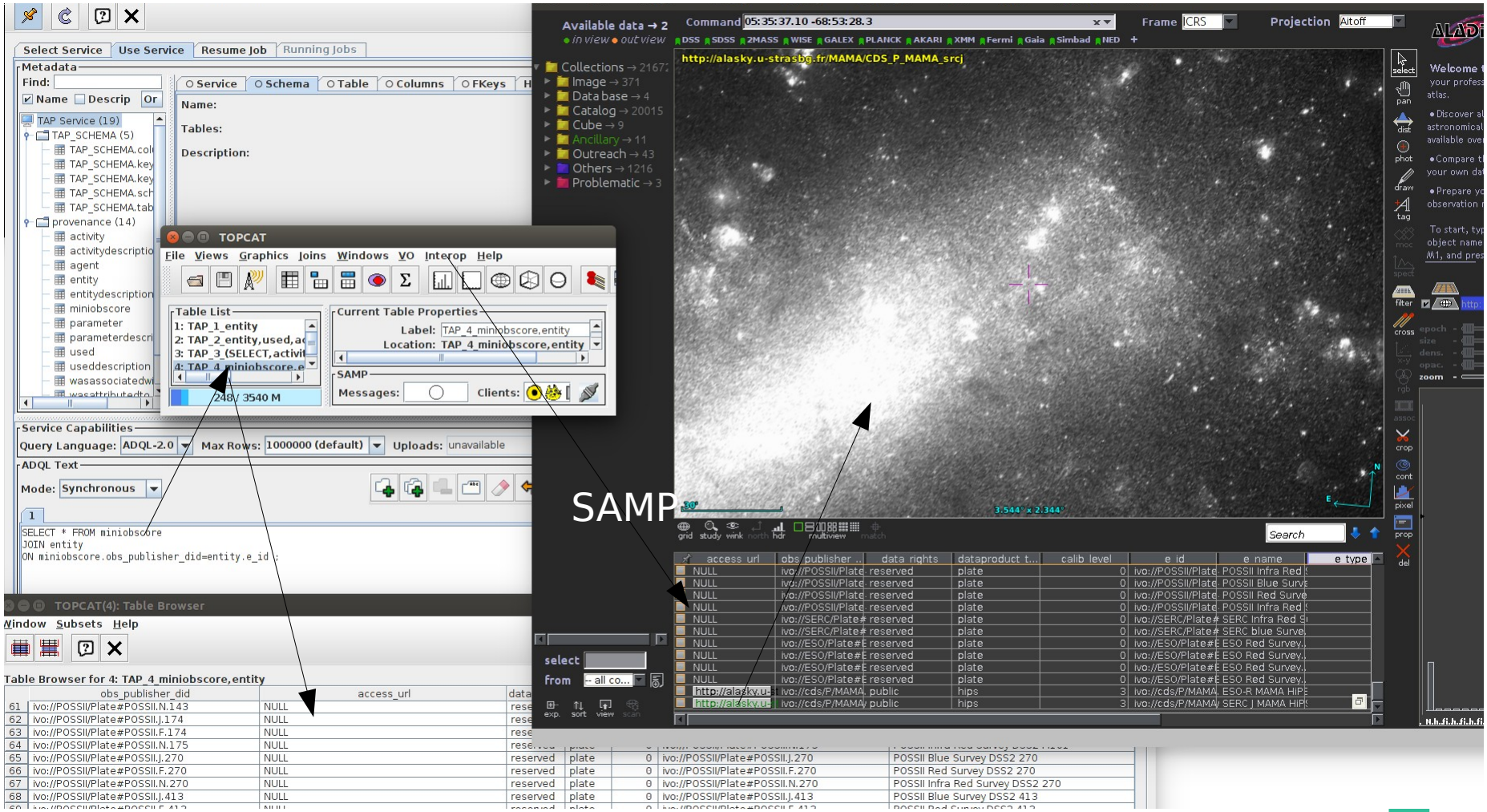
```
 SELECT * FROM miniobscore
JOIN entity
ON miniobscore.obs_publisher_did=entity.e_id ;
```

Activities which have parameters



Join entities and obscore records

Loading HiPS or images into Aladin



Future plans

- Publish the ProvTAP working draft
- Install publicly the TAP service for our CDS database
- Markus Nullmeier to create stored procedures helping for complex queries (end september)
- Feed with the real use case :

HiPS generation at CDS

(~300 HiPS come from ~300 image collections. Some image collections also have progenitors (eg. Schmidt plates)