

Last news from

IVOA data access layer WG(DAL)

- related CDS developments



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□ DAL landscape

VOTABLE	TAP,ADQL	→ADQL 2.1 ObsTAP ([Obscore 1.0] -> 1.1)
	SLAP	DALI 1.0 (common spec)->1.1
	ConeSearch,SIIV1	
	SSA1.1	SIIV2.0 SODA 1.0 (AccessData)
		DataLink 1.0 SimDAL 1.0 VTP 2.0



DAL landscape and data avalanche

- DAL landscape is complex
 - 14 different protocols in use or close to recommendation
 - Include new major versions
- Increase of data volume is going faster than recommendation process
 - Balance between resources and requirements is difficult
- Two ways
 - Understanding DAL landscape
 - Prepare evolution
 - -> ADASS XXVI poster (Molinaro and Bonnarel)



DAL protocol properties

- Data types
 - Catalogs/tables
 - Images/cubes
 - Spectra/TimeSeries
 - Theoretical data
 - Spectral lines
 - Raw or “low level” data (“event lists”, “visibility”)
- User functionalities
 - Discovery
 - Description
 - Basic access
 - Extended Acces
 - links
- Interface and software aspects
 - Sync/async
 - DALI Compatibility
 - ADQL
 - parametric language
 - ...





DAL protocols

	Design	Functionalities					
Data type		ConeSearch-Discovery	Multi-dimensional Discovery	Description (NB: SIA1 is very different from others)	Simple-Access	Access-processing	Link
Catalogues/ tables	Sync	TAP,CS,ObsTAP	TAP,ObsTAP		TAP,CS		DataLink
	Async	TAP,ObsTAP	TAP,ObsTAP		TAP		
	ADQL	TAP,ObsTAP	TAP,ObsTAP		TAP		
	PBL	CS			CS		DataLink
	DALI	TAP,ObsTAP	TAP, ObsTAP		TAP		DataLink
	No-DALI	CS			CS		
Spectra / timeseries	Sync	SSA,ObsTAP	SSA,ObsTAP	SSA,ObsTAP	SSA	SSA	DataLink
	Async	ObsTAP	ObsTAP	ObsTAP			
	ADQL	ObsTAP	ObsTAP	ObsTAP			
	PBL	SSA	SSA	SSA	SSA	SSA	DataLink
	DALI	ObsTAP	ObsTAP	ObsTAP			
	No-DALI	SSA	SSA	SSA	SSA	SSA	DataLink
Images/ cubes	Sync	SIA1,SIA2,ObsTAP	SIA2,ObsTAP	SIA1,SIA2,ObsTAP	SIA1,SODA1.0	SIA1,SODA1.1	DataLink
	Async	SIA2,ObsTAP	SIA2,ObsTAP	SIA2,ObsTAP	SODA1.0	SODA1.1	
	ADQL	ObsTAP	ObsTAP	ObsTAP			
	PBL	SIA1,SIA2	SIA2	SIA1,SIA2	SIA1,SODA1.0	SIA1,SODA1.1	DataLink
	DALI	SIA2,ObsTAP	SIA2,ObsTAP	SIA2,ObsTAP	SODA1.0	SODA1.1	DataLink
	No-DALI	SIA1		SIA1	SIA1	SIA1	

	Design	Functionalities					
Data type		ConeSearch-Discovery	Multi-dimensional Discovery	Description (NB: SIA1 is very different from others)	Simple-Access	Access-processing	Link
Raw data/ Event list/ Visibility	sync	ObsTAP	ObsTAP	ObsTAP			DataLink
	async	ObsTAP	ObsTAP	ObsTAP			
	ADQL	ObsTAP	ObsTAP	ObsTAP			
	PBL						DataLink
	DALI	ObsTAP	ObsTAP	ObsTAP			
	No-DALI						
Spectral Lines	sync	SLA	SLA	SLA			
	async						
	ADQL						
	PBL	SLA	SLA	SLA			
	DALI						
	No-DALI	SLA	SLA	SLA			
Theory data	sync		SimDAL	SimDAL	SimDAL	SimDAL	SimDAL
	async						
	ADQL						
	PBL						
	DALI						
	No-DALI		SimDAL	SimDAL	SimDAL	SimDAL	SimDAL

Cube Access Scenario

VO science priority 2013

- I) Service Discovery :
 - > discover cube services in IVOA Registry
 - **ObsTap** (generic, ObsCore, ADQL)
 - SIAV2 (cube oriented, parametric query)
- II) **ADQL query** from ObsTAP service
 - > the response is a VOTABLE serializing ObsCore model and Describing selected « datasets ».



Cube Access Scenario bis

VO science priority 2013

- I bis) Service Discovery :
 - > discover cube services in IVOA Registry
 - ObsTap (generic, ObsCore, ADQL)
 - **SIAS2 (cube oriented, parametric)**
- II bis) **parametric query** from SIAS2 service
 - -> response is a VOTABLE serializing the ObsCore model
 - and describing selected “datasets”.



Cube Access Scenario (end)

VO science priority 2013

- III) DataLink {links} resource
 - Fixed links,
 - metadata services,
 - Proprietary services (DataLink « service descriptor »)
 - SODA service (« Server-side operation for DataAccess »)
- III bis) direct path to SODA (via « service descriptor »)
- IV) SODA:
 - Extraction driven by parameters similar to Query ones
 - CIRCLE = 12 34 0.5
 - POS= POLY 12.0 14.0 12.0 16.0 15.0 16.0 15.0 14.0
 - BAND=500 550
 - TIME= 55000.0 56000.0
 - POL=Q,POL=.....



□ Status of multi-d protocols

- ObsCore 1.1 / ObsTAP (recommendation March 20th 2017 !!!)
- DataLink (June 18th 2015)
- SIA2.0 (december 23rd 2015)
- SODA (very close to recommendation)
- **minimal CSP demands eventually satisfied!!!**



DataLink 1

service descriptor

- Mechanism for HTTP-PARAM service description

- Based on VOTABLE PARAM features

- 3 factor semantics: name, unit, ucd

```
<RESOURCE type="meta" utype="adhoc:service" ID="soda-sync">
  <PARAM arraysize="*" datatype="char" name="accessURL" value="http://www.cadc-ccda.hia-ihc.nrc.cnrc.gc.ca/caom2ops/sync"/>
  <GROUP name="inputParams">
    <PARAM arraysize="*" datatype="char" name="ID" value="" ref="fileURIRef"/>
    <PARAM arraysize="*" ucd="obs.field" datatype="char" name="PAR1" >
      <VALUES>
        <MIN>.....</MIN>
        <MAX>.....</MAX>
        <OPTION>.....</OPTION>
      </VALUES>
    <PARAM arraysize="2" ucd="em.wl;stat.interval" datatype="double" name="PAR2" unit="m" />
    <PARAM arraysize="2" ucd="time;stat.interval" datatype="double" name="PAR3" unit="d" />
    <PARAM arraysize="2*" ucd="phys.polarization.stokes" datatype="char" name="PAR4" />
  </GROUP>
</RESOURCE>
```

- Can describe proprietary or standard services in/for

- SIA, SSA, COneSearch responses
- DataLink {links} resource
- SODA



DataLink 2

{links} RESOURCE

Response is a table for one/several datasets including

The list of links that is returned by the {links} resource can be represented as a table with the following columns:

name	description	required	UCD
ID	Input identifier	yes	meta.id;meta.main
access_url	link to data or service	one only	meta.ref.url
error_message	error if an accessURL cannot be created		meta.code.error
service_def	reference to the description of a service at access_url	no	meta.ref
description	human-readable text describing this link	no	meta.note
semantics	limited vocabulary describing this link	no	meta.code
content_type	mime-type of file the link returns	no	meta.code.mime
content_length	size of download the link returns	no	phys.size;meta.file

Cube average with fixed links, accessdata (*custom services*)
Calibrated data, provenance metadata, SODA



□ DALI, TAP

- DALI
 - Common rules (IVOA services common parameters, xtypes, etc..)
 - Last changes :
 - Polygon orientation (ccw)
 - predefined xtype list
 - Z in “timestamps” allowed for usual times
 - discussion internal to the group completed. “Proposed recommendation”
- TAP 1.1 :
 - compatibility with new DALI (less things defined in TAP)
 - Simplification of region specification
 - Questions related to TAP_SCHEMA evolution.
 - PR soon
 - TAPRegEXt is adApted to TAP 1.1, will be adOpted only after

□ ADQL

- ADQL 2.1 :
 - new functionalities (with respect to ADQL 2.0 eg cross-match) ,
 - BNF is unreliable
- Trieste Interop decision :
 - BNF fixed before going to “proposed recommendation”

□ Hosted protocols (2 new recommendations)

- SimDAL : discovery description access to theoretical data
 - Developed by Theory interest group (Carlos Rodrigo, with editors D.Languignon, F.Lepetit).
 - **Recommendation March 20th 2017 !!!!!.**
- VTP (= VOEvent transport protocol) defines communications of VOevents in a network of « brokers », « publishers » and « clients »
 - **Recommendation March 20th 2017 !!!!!.**

□ DAL future (1)

- Discovery and access for TimeSeries (science priority) .
 - Use cases and requirements
 - Prototyping with TDIG and DM WG.
- Feedback on recent standards (SIAPV2, DataLink, SODA)
- Coupling with MOC and HiPS is important
- Pushing user code to the data
- page on IVOA Site and interop session in Shanghai
<http://wiki.ivoa.net/twiki/bin/view/IVOA/DALFuture>

□ DAL future (2)

- Formats (Json ?) languages (PQL ? PDL ? ???)
- New SLAP version (line access – CM Zwolf, N Moreau)
 - 1.1 with consistent with 1.0 and better agreement with VAMDC data model
 - SLAP2 implementing full VAMDC DM will be discussed later



RELATED CDS DEVELOPMENTS

□ Recent CDS developments related to DAL: TAP interface in Aladin

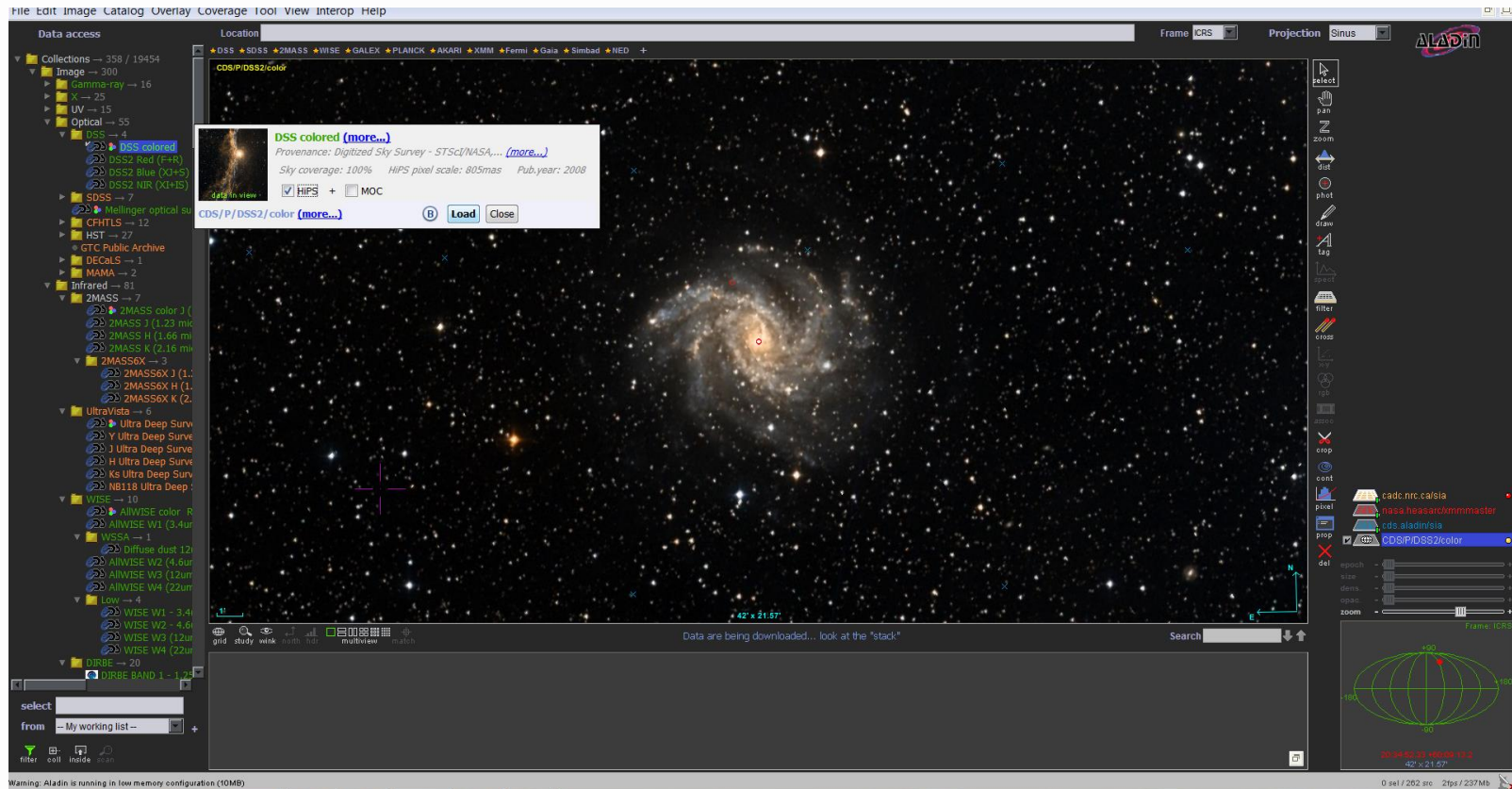
- It was missing
- Recent Strong motivation due to:
 - CDS participation to Gaia DR1 distribution
 - ObsTap services with images and cubes
- → integration of TAP interface in main Aladin code (rather than a Plugin)
 - Generic and customized Interfaces
- → **Chaitra demonstration**

□ SIAV2 and DataLink interfaces

- Classical GLU form
- ObsCore response interpreted
- DataLink interface
- -→ Chaitra presentation

Soon in Aladin 10

Data Discovery tree : HiPS case



Soon in Aladin 10

Data Discovery tree: SIA case (also TAP, SSA...)

The screenshot shows the Aladin 10 software interface. The main window displays a deep space image of a galaxy cluster. The interface includes a 'Data access' sidebar on the left, a central image window with a toolbar, and a bottom panel displaying a table of search results. A 'Data Discovery tree' dialog box is open, showing options for SIA, Cone search, and TAP. The table lists columns like obsid, status, name, ra, dec, time, duration, p1_fname, p1_fname, public_d, data_in, SIA_title, SIA_scale, SIA_axes, SIA_format, SIA_ref, and SIA_ref.

obsid	status	name	ra	dec	time	duration	p1_fname	p1_fname	public_d	data_in	SIA_title	SIA_scale	SIA_axes	SIA_format	SIA_ref	SIA_ref
0200670201	archived	NGC 6946	308.71785	60.15331	53169.7877	15612	Enle	Matthias	53591	Y	P0200670	-0.001111	648,648	2	image/fits	https://h...
0200670401	archived	NGC 6946	308.71785	60.15331	53181.6862	21209	Enle	Matthias	53591	Y	P0200670	-0.001111	648,648	2	image/fits	https://h...
0401360101	archived	NGC 6946	308.71785	60.15331	53878.4328	20908	Enle	Matthias	54285	Y	P0401360	-0.001111	648,648	2	image/fits	https://h...
0401360201	archived	NGC 6946	308.71785	60.15331	53888.3651	24419	Enle	Matthias	54285	Y	P0401360	-0.001111	648,648	2	image/fits	https://h...
0401360301	archived	NGC 6946	308.71785	60.15331	53904.3223	24407	Enle	Matthias	54285	Y	P0401360	-0.001111	648,648	2	image/fits	https://h...
0900720101	archived	NGC 6946	308.71785	60.15331	54419.9576	31929	Enle	Matthias	54847	Y	P0500720	-0.001111	648,648	2	image/fits	https://h...
0900730201	archived	NGC 6946	308.71785	60.15331	54406.9121	37300	Enle	Matthias	54847	Y	P0500730	-0.001111	648,648	2	image/fits	https://h...
0092641601	archived	NGC 6946	308.71785	60.15389	52776.9502	10096	Bauer	Franz E.	53188	Y	P0092641	-0.001111	648,648	2	image/fits	https://h...