

IVOA Data access layer project

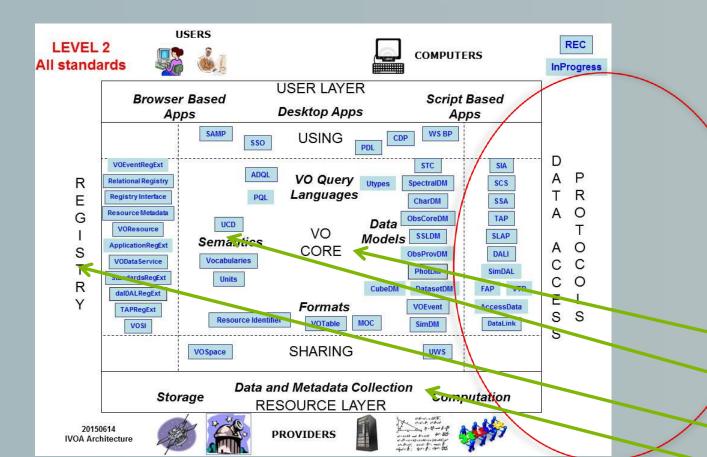






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IVOA DAL Working Group Project and Objectives



- A group created at the very beginning of International VO alliance
 - Goal is to define protocols to homogenize
 - data discovery,
 - data description,
 - data retrieval,
 - data access processes:
 - providing direct client access to dynamically computed subsets of remote astronomical datasets

Relationships with

Data Model : query based on data model concepts, responses are serialised instances of data models Semantics: use of standardized vocabulary

DAL within IVOA Architecture

Registry : standardized description and discovery of the services

UWS : asynchronous mode support

Historical protocols

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ConeSearch interface and VOTABLE query response

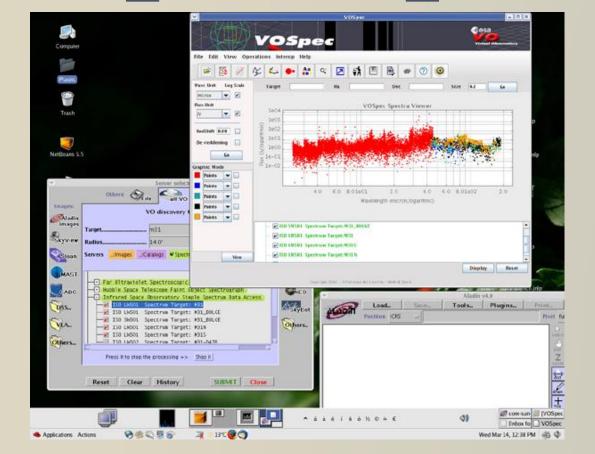
□ 1st generation:

- **Cone search** : simple ROI constraint for catalog of sources. VOTABLE output
- Simple Image Access : ConeSearch and other additional parameters constraints.
 - **VOTABLE** query response for data discovery giving standardized image description.
 - Retrieval and "Mosaic" generation.
- Simple Line Access

2nd generation

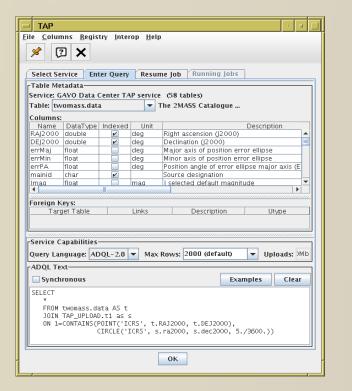
- SSA : Simple protocol like SIA but expressed in terms of a comprehensive spectral data model
- TAP : interoperable relational model query services

Simple Spectral Access



- **Standard query parameters to constrain all axes**
- Additional Optional PARAMETERS (APERTURE, SPECRP, TIMERES, etc...)
- Query response is a VOTABLE
 - **Organized in GROUPS mapped from Spectrum Data Model packages:**
 - Dataset, Curation, Derived, Characterisation, Coordinates, etc...
 - Model attributes tagged with utypes

Spectrum discovery with SSA Display in VOSPEC

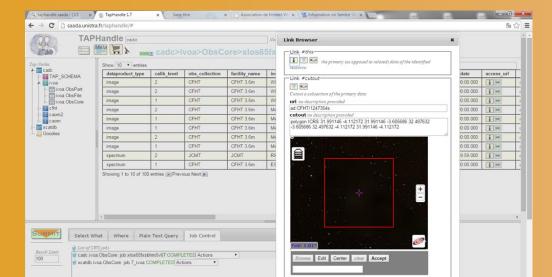


TAP service interface within TOPCAT

TAP and ADQL

- A standard protocol to expose and query relational tables
- RESTful service where asynchronous mode is consistent with IVOA Universal Worker Service standard
- Structure and Model exposed with the TAP_SCHEMA and VOSI-table descriptions: standardized metadata
- Query via ADQL language (astronomical extension of SQL)
- ObsTAP: standard data model (ObsCore) exposed via a TAP service to support uniform cross-wavelength data discovery

Recent or current developments of new protocols



Collection of service capabilities (components) to provide multi-dimensional data discovery and access (science priority)

- DataLink : Standardized methods to link resources to known datasets
- **SIAV2.0** : parameterised query (PQL) of the ObsCore 1.1 data model for simple

- Virtual data generation:
 - services typed cutout or mosaic generate a "best match to query parameters" dataset



- interoperable data discovery
- AccessData : Driving Server-side processing for excerpting information from the datasets

ObsTAP response within TAPhandle and DataLink

Lessons learned from DAL development

Science use cases often involve using a collection of services in a sequence of steps:

> in general, one service cannot always satisfy requirements

moving toward modularity:

single purpose service capabilities that can be combined to support science use cases

common patterns and features:

extracted into Data Access Layer Interface (DALI) for easy re-use and consistency

Two « branches » of protocols exist :

Relational-model protocols (more complex, more powerfull) versus object-model protocols (simpler, implementation flexibility, usability) Open question of Parameter Query Language purpose

Input/output homogeneity versus readibility