INTERNATIONAL VIRTUAL OBSERVATORY ALLIANCE
US National Virtual Observatory

IVOA Data Access Layer
Simple Image Access Version 2 (SIAV2)

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SIA Version 2

- Topics
  - Time today limited (45m total, 2 presentations); followup offline
  - Brief followup on ADQL and DAL
    - Potential role of ADQL in an interface like SIAV2
  - DAL Architecture
    - Generic dataset concept
    - Role of SIAV2 re generic dataset / complex data
  - SIAV2 First Look
    - Capabilities
    - Interface
- SIAV2 doc is online at DAL TWiki -> image access -> doc
  - http://www.ivoa.net/internal/IVOA/SiaInterface/SIA-V2-Analysis.pdf

ADQL and DAL (SIAV2, Generic Dataset)

- Concept has been around for a while
  - Parameter-based query would remain the standard interface
  - ADQL-query has been considered as an optional advanced capabilit
  - Would not change anything which is already there
  - Merely an alternative way of posing the query
- However
  - Query expression is better for discovery than actual data access
  - May be better to use ADQL only for the generic dataset query

DAL Architecture Reminder

- Class Hierarchy
  - "primary dataset" is an individual table, image, etc.
  - "complex dataset" is some association of these
  - "data collection" is a collection of datasets of some type
- Classes
  - *Generic Dataset* (root)
    - *Table* (TAP)
    - *Image* (SIA)
    - *Spectrum* (SSA)
    - *TimeSeries* (SSA-variant)
      - etc.

Generic Dataset

- Provides
  - Inheritance, common core interface and semantics
  - Basic query interface
    - parameter-based (POS,SIZE,BAND,TIME etc.)
    - possibly also ADQL eventually, as an optional alternative
  - Basic query response
    - generic dataset metadata
    - query formatting
  - Data Associations
    - basic mechanism used for complex data
    - catalog, image, cube, spectrum, etc. part of an assocation
    - other association metadata describes type of association
- Implications for SIAV2
  - SIAV2 deals only with Image associations (as for SSA and spectra)
  - More complex associations (complex data) left to GD

SIAV2 Major Capabilities

- Basic Capabilities
  - Updated query interface and query response
  - Simple 2-D access to whole image or cutouts
  - Basic 2-D access does not change much except for updated interfa
- Whole-Image Access
  - Retain POS,SIZE with minor generalization as for SSA
    - still a rectangle of course
  - Add REGION parameter (as proposed for TAP)
- Image Cutouts
  - ROI generalized to POS,SIZE, BAND, TIME, and probably POL
  - Add POL (or whatever) for polarization - important for cubes
  - Cutout is easily generalized to N-D

SIAV2 Major Capabilities

- Cube Data Access
  - Generalize model from 2-D to N-D (spatial, spectral, time, pol)
  - Nontrivial types of access are cutout, resample, reduction
- Cutout
  - Only ROI (POS,SIZE,BAND,TIME etc.) required for a cutout
- Resample
  - Access based upon specifying output image geometry and/or WCS
- Reduction
  - Reduce dimensionality along an axis (potentially to npix=1)
  - Specify how to do this (sum, mean, mode, min, max, etc.)
  - Can filter an axis in the process

SIAV2 Major Capabilities

- Multi-Position Queries
  - Basic capability is much as proposed for TAP
  - Multi-position table uploaded inline or via VOSpace
  - POS points to this table
  - More general parallel parameter set approach also possible
- Grid Capabilities
  - Much as proposed for TAP
  - Async based upon UWS, VOSpace input/output, anon/SSO auth
- Complex Data
  - Image associations supported in SIA query, otherwise use GD

SIAV2 Interface

- Query Parameters
  - Much as for SSA (generic dataset)
  - Main difference is image geometry and WCS
- Query Response
  - Much as for SSA (generic dataset)
  - Much the same
    - *Query, Assocation, Access, Protocol, DatasetID, Curation, Target, Derived CoordSys, Characterization*
  - Different for SIA (main focus)
    - *Dataset* (image) metadata, WCS
- See SIAV2 document for further details