INTERNATIONAL VIRTUAL OBSERVATORY ALLIANCE

IVOA Data Access Layer
SSAP and SIAP-V2

Doug Tody (NRAO/NVO)

DAL-1 Session (Cambridge 2007)

- Spectral Applications
  - VO for Ground-based Optical Spectroscopy (Petr Skoda)
  - SSA and the JHU Spectrum Services (Laszlo Dobos)
- SSA
  - SSA V1.0, V1.1 update (D. Tody)
- SIA V2
  - Service functionality (D. Tody)
  - Interface issues (F. Bonnarel)
- SLAP
  - (if we have a speaker)

Spectral Access

Spectral Protocols

- SSA V1.0
  - RFC completed, approved for consideration as recommendation
  - Specification updated in response to RFC (V1.02 Sept. 17)
  - Numerous client and server implementations (15-20 or so)
- SSA V1.1
  - Will go forward over next several months
- TimeSeries, SED, etc.
  - Still in discussion stages

SSA V1.02 Revisions

- Summary
  - Most changes were to tighten or clarify the text
  - A few minor interface changes/updates as well
- Highlights
  - FLUXCALIB, WAVECALIB now string valued; added "normalized"
  - Added SpectralAxis and FluxAxis to Dataset model
  - New "concept" section defining dataset identifiers
  - New "concept" section introducing UTYPE, UCD
  - Added Dataset.Deleted for use with MTIME
  - Some Characterization metadata changed (Accuracy, Sampling)
  - Added subset of data model spreadsheet as appendix
  - Added TSAP (theory-SSAP) use case as appendix

SSA V1.0 Implementations

- Libraries and Toolkits
  - DALServer Java toolkit (NRAO, NVO). Does both queries and datasets.
  - Spectrum Java library (SAO, NVO). Spectrum data model.
  - C# SSA toolkit (JHU, HVO). Used for SDSS DR6 services.
  - Perl implementation (VO-Paris, Igor)
  - PHP implementation (STScI)
- Services
  - NRAO (DALServer based) JHU/SDSS proxy service sample query
  - Selected GOODS/FORS2 spectra at ESO (DALServer based): metadata, sample query
  - JHU/HVO SDSS DR6 spectra native service
  - INAF (Milan-Marseille) VVDS-DEEP spectra
  - ST-ECF grism spectra (DALServer based)
  - VO-Paris (Russian 6m, LSPEO) - SpectrumDM; not sure of SSA service status
  - NOAO has a partial SSA implementation (getData for Coude Feed spectra)
  - LAEFF/SVO have an SSA service that is used for TimeSeries light curves
- Clients
  - SPLAT Java client (Starlink)
  - JHU Spectrum services Java Web client
  - Specview Java client (STScI) - just coming up; VOTable support incomplete
  - VOSpec (ESAC) - Not sure of level of support for SSA V1.0
  - VirGO v1.2.1 beta (ESO)

SSA V1.1 plans

- Scope
  - Adds *getCapabilities*, *getAvailability* service operations
  - Basic interface mostly or fully backwards compatible
- getCapability
  - Returns service metadata (Capability element of VOResource)
    - Some work to do yet to define this metadata
    - Includes both service capabilities and interface
    - Input parameters including any custom parameters
  - Interim FORMAT=metadata will be deprecated

Time Series, SED, etc.

- Time Series
  - Spectrum data model can support time series with minor changes
    - LAEFF/SVO have actually already done this
    - data modeling discussions underway in DM group
  - SSA query interface will work for TimeSeries with minor changes
  - Relation to AstroGrid/Solar STAP unclear at this point

- SED, Multi-segment spectra, etc.
  - Best way to handle this is still under study between DAL, DM
  - Probably generalize Spectrum to general Photometry model
  - Spectrum, TimeSeries, SED, etc. based upon Photometry model
  - Multi-segment spectra/timeSeries may be a special case
  - SED is complex and requires additional modeling effort

Image Access

SIA V2 Planning

- Status
  - General discussion of priorities in Beijing
  - Starting to look at service interface form, issues
    - first looks by FB, DT for this meeting
- Priorities Reminder
  - Major update of SIA to be robust 2ndGen DAL interface
  - Query interface, metadata based upon SSA
  - Add Grid capabilities
    - async, staging, SSO authentication
  - Functional enhancements
    - data cube support, multi-position support

Region Specification

- POS, SIZE
  - Defines rectangular region (default coverage of output image)
  - String form allows alternative representations via syntax
- Possible changes
  - Alternative spatial reference frames carry over from SSA (galactic)
  - Consider adding rotation as well
  - More complex regions, e.g., convex polygon
  - Pointer to separate multiple region/position table

Multiple Region Support

- Motivation
  - Scalability; thousands of image cutouts in one operation
  - Also needed for TAP, SSA, etc.
- Input
  - VOTable containing ID, POS, SIZE, possibly other params
  - Anything else is passed through to output
  - Query is a POST, with params plus table (multipart/form-data)
- Output
  - Same as for standard query, but merged, tag with region code
  - Query response could be quite large (but this is already the case)
- Processing
  - Spatial indexing can be used to speed processing
  - Each region is independent; easily parallelized

Query Interface

- Asynchronous Execution
  - Initiate query with multipart/form-data POST as for multi-pos
    - query can itself be asynchronous if necessary
  - StageData request also uses POST, returns job ID
    - UWS mechanism used to monitor execution (details TBD)
    - job description (based upon image references) TBD
- Image Access
  - Based upon image generation parameters
    - specify geometry (NAXIS, NAXES) and WCS of output image
    - BAND, TIME used to "cutout" spectral and time axes
  - Metadata
    - client needs base image geometry, WCS to plan precision access