INTERNATIONAL VIRTUAL OBSERVATORY ALLIANCE
US National Virtual Observatory

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

D. Tody, F. Bonnarel, J. Salgado

SIA Version 2

- Status
  - SIAV2 Concept document presented in Trieste
  - Working out details of architecture, functionality, models
  - Related efforts underway, e.g, TAP, DM, GWS
- Topics for Today
  - Related Developments
  - SIAV2
    - SIAV2 Scope
    - SIAV2/DAL2 Concepts
    - SIAV2 Functionality
  - Roadmap

http://www.ivoa.net/internal/IVOA/SiaInterface

Related Developments

- DAL2 Architecture
  - Generic dataset, generic vs typed interfaces, complex data
  - Data models, dataset metadata, use of UTYPE
  - Virtual data, common service elements
  - Service interface, Grid capabilities
- TAP
  - Multi-position queries, table uploads
  - Grid capabilities (UWS, VOSI)
- Data Models
  - Photometry model, Observation model

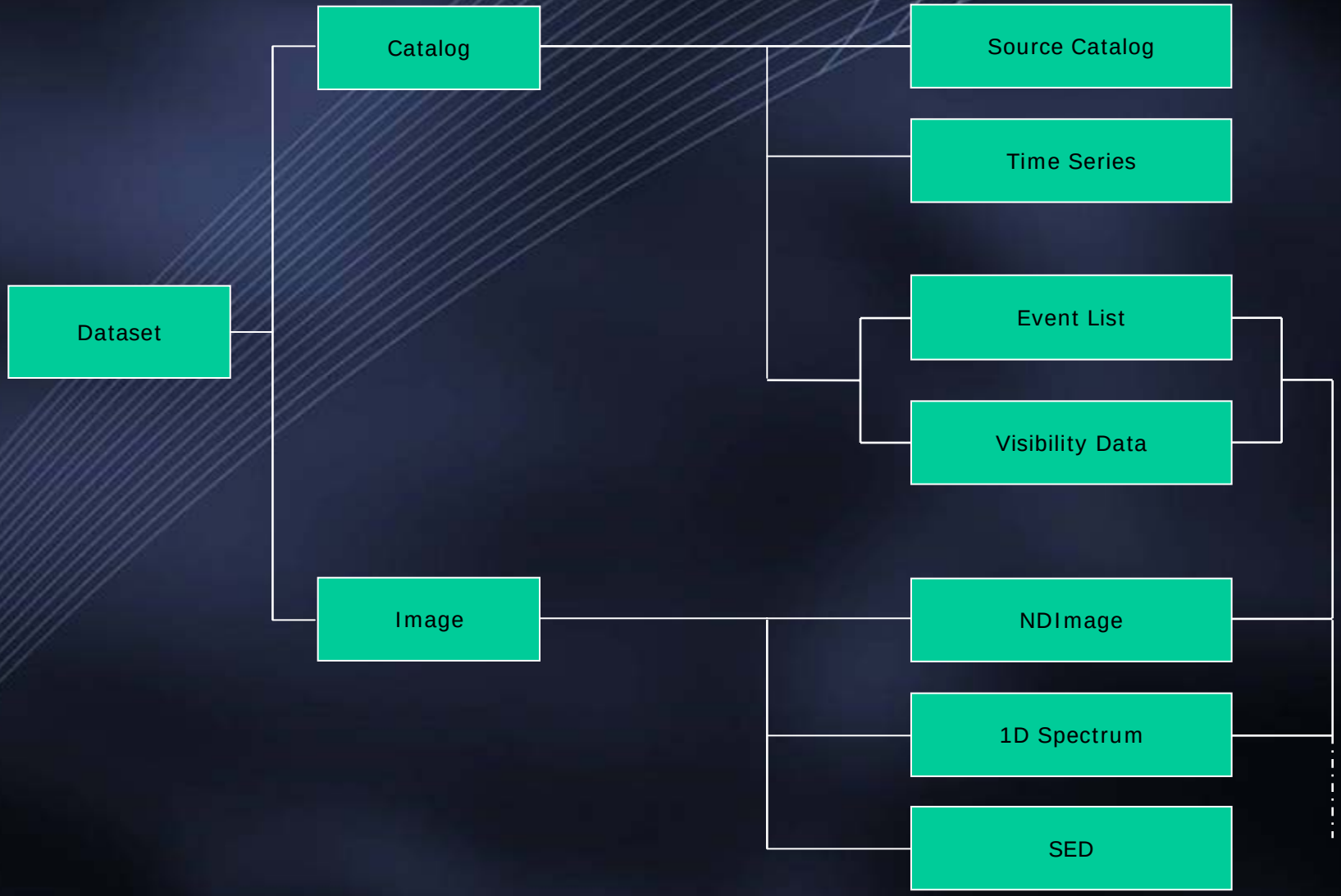
SIAV2 Scope and Priorities

- Update service interface to DAL2 standards
  - Query interface, query response, dataset metadata
  - Keep basic interface simple to understand and use
- Generalize to multidimensional data (cubes)
  - Major class of data not yet supported (radio data cubes)
  - Cube data very large – needs VO capabilities for basic access
  - Not that hard – model is already multi-dimensional
- Feature enhancements
  - Multi-position queries, regions
- Grid capabilities
  - Async (UWS), vospace, VOSI, eventually authorization

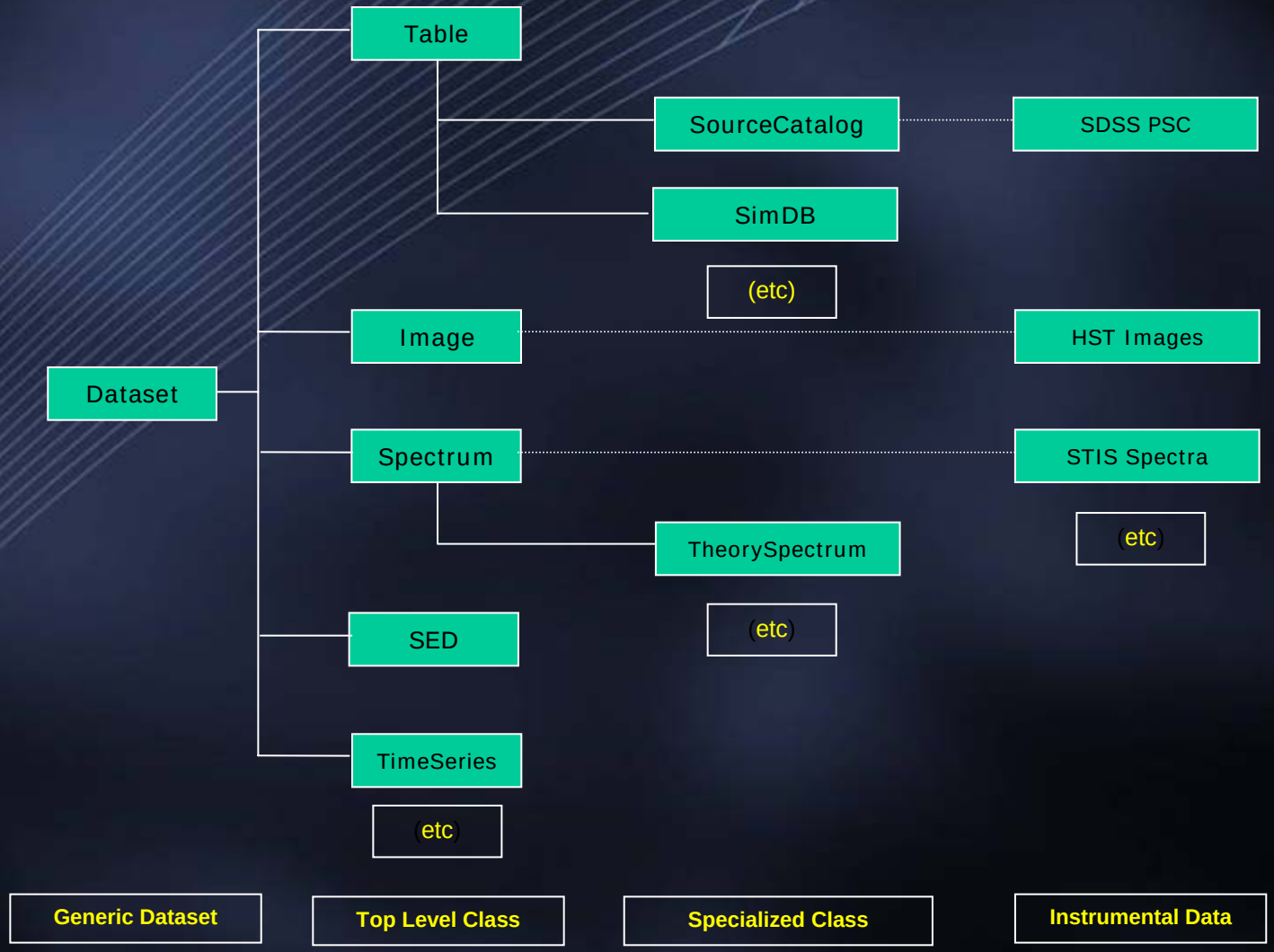
DAL2/SIAV2 Concepts

- Generic dataset
  - Root of dataset class hierarchy
  - All typed, specialized, instrumental datasets derive from it
  - Can discover and describe any type of data
  - Can relate different types of data in a single query
- Inheritance
  - Main query parameters are shared
  - Most dataset metadata is shared (generic dataset metadata)
  - Query interface implementations mostly common

Historical DAL Service Architecture (Cambridge UK, May 2003)



Current DAL class hierarchy of data and their associated services



DAL2/SIAV2 Concepts

- Complex data
  - An association of primary datasets (catalog, image, spectrum etc)
  - Usually with some additional metadata
    - e.g. using metadata extension mechanism
  - Association can be made dynamically in query response
- Example
  - Survey field with spectral cube, 2-D projection, source catalog
- Issues
  - Open ended – every use case is different
  - Need use cases

DAL2/SIAV2 Concepts

- Associations
  - Basic mechanism used to describe complex data
  - Already used in SSA query response
- Many examples
  - Multiformat, preview, multiresolution, multiband, replica, etc.
- Issues
  - Ok for simple cases; could be cumbersome if assoc too large
    - but too many things can change between records
  - Need use cases

SIAV2 Functionality

- Single-position queries
  - Much as for SIA V1 (POS, SIZE; add spatial frame)
  - Archival, cutout, reproject, mosaic, etc.
- Multi-position queries
  - Same SIA query performed on many positions simultaneously
  - Should use same position table as for TAP etc. (all of DAL2)
    - position table can be uploaded in-line in query
    - or could be a URI ref, DBMS table, in a VOSpace
- REGION-based queries
  - This is also being prototyped in TAP
  - Used for discovery, not for defining image boundary
  - Can use REGION to constrain a position table

Cube data access

- Cube access
  - Technique is to describe geometry and WCS of output image
  - Service then makes the requested image
- WCS model and usage
  - Uses "Mapping" model based upon FITS WCS
  - STC used to define coordinate systems
- Polarization model and usage
  - Polarization parameters enumerated as part of data
  - Stokes parameters (I,Q,U,V) are most common
  - Single polarization axis with discrete sample "coord" values

Roadmap

- Specification
  - Sketch service interface (fall 2008)
  - Start on SIAV2 working draft (early 2009)
- Prototyping
  - Begin protype implementations (early 2009)
  - Prototypes (NVO, CDS, ESAC, others?)
    - unlikely to implement cube access initially
    - probably will include UWS, multi-pos
- Working Draft
  - First working draft for WG discusussion (May 2009)
- Longer Term
  - Prototype cube access with data providers