Time Domain Data:
VODML approach

Mark Cresitello-Dittmar

Acknowledgments

- Contributions based on work being done by the VO-DML and Mapping team
  - Gerard Lemson
  - Omar Laurino
  - Laurent Michel
  - Tom Donaldson
- Opinions expressed are my own, and don't necessarily reflect those of the team.

Objectives

- Support TDIG exploration of TimeSeries by
  - Generating toy model for SimpleTimeSeries
    - VO-DML compliant
    - Extending current models
      (dataset, cube, coords, meas)
  - Annotate the sample VOTable datasets
    - Using proposed mapping syntax
    - As instance of Cube
    - As instance of SimpleTimeSeries
  - Provide feedback regarding other approaches

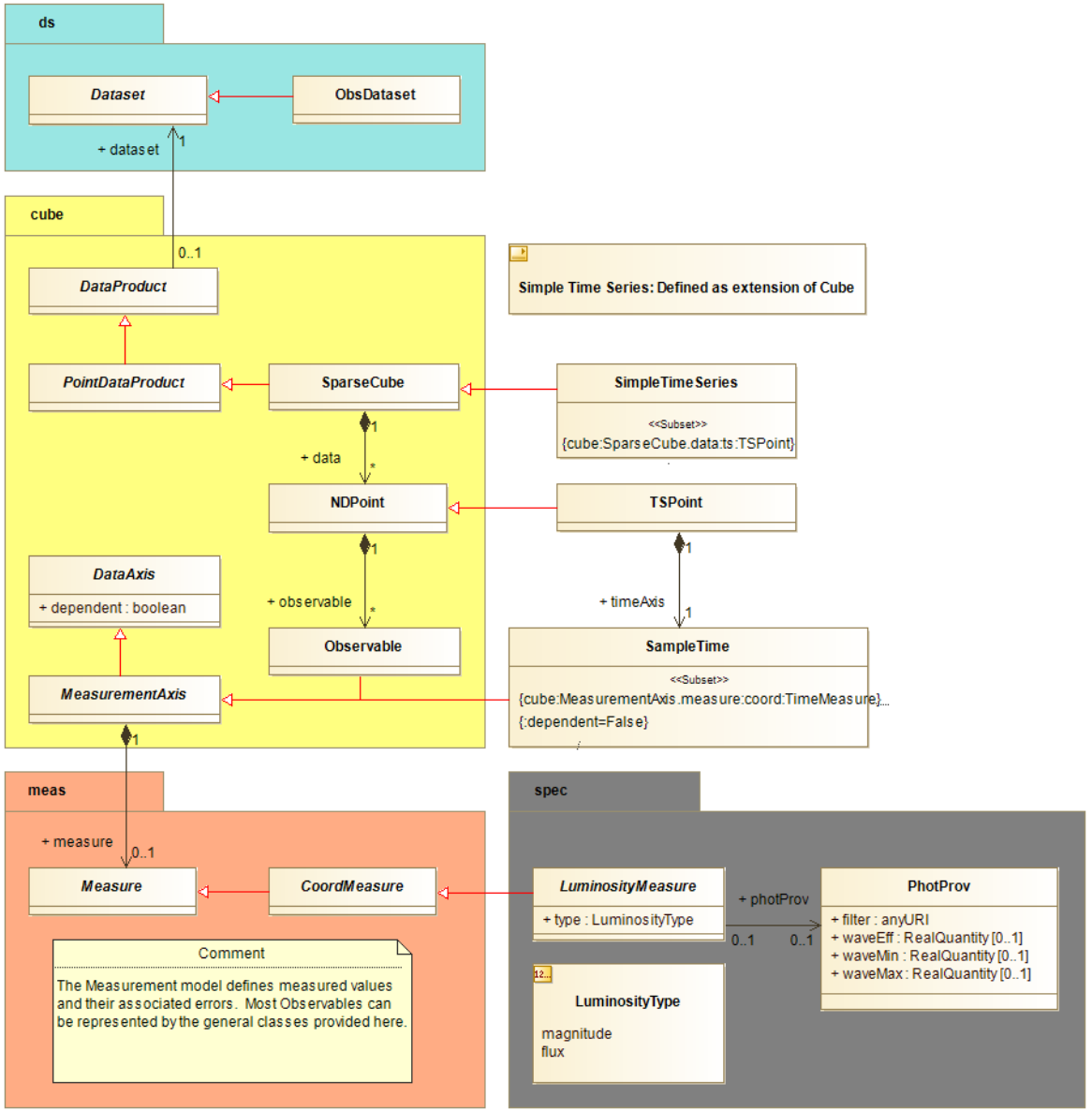
Comments

- Use of multiple models + multiple seralization strategies make goals of the study unclear
- Using single model:
  - All serializations map to same model, so can be compared directly
  - VO-DML compliant model is most re-usable moving toward 'official' model.
- Independent modeling approaches had very similar results conceptually
  - Merging should be straight forward

Comments

- Mapping syntax supports a wide range of use cases, any alternate syntax should be evaluated against these requirements.

SimpleTimeSeries Model



Model caveats

- This is a prototype model, sufficient to satisfy the requirements of this study and sample files
- An official model would require full review of all time domain requirements

Serializatons

- BetaLyr Vizier sample file
  - 1-instance of ObsDataset
  - 5-instances of SimpleTimeSeries data products, one for each band (J,K,L,M,N)
  - 5-TSPoint templates, each with
    - 1-Time + 1-Observable (Mag with Error)
  - Choice to use 1 row Tables for metadata made for awkward annotation, requiring ORM elements for simple content
    - Alternate serialization greatly simplifies annotation; see https://olaurino.gitlab.io/ivoa-dm-examples/0000/01/10/PythonParserDemo.html

Serializatons

- GAIA sample file
  - 0-instance of ObsDataset
  - 3-instances of SimpleTimeSeries data product
  - 3-TSPoint templates, each with 3 observables
    - 1-Time + 1-Flux_w_Error + 1-Mag
  - Pretty straight forward annotation
    - Changed VOTABLE tag to version 1.4 to validate against vo-dml schema
    - Added IDs to TABLE elements to reference in vo-dml annotation
    - Added IDs to PARAM elements for Filter metadata

Feedback

- Mapping syntax provides severval benefits over any utype based annotation syntax:
  - Isolating the annotation from the VOTable elements allows data providers to retain their native serialization.
  - Protects against model changes
  - Allows reuse of elements
    - Single PARAM or FIELD serve multiple roles
  - Clear association of an instance to a role
    - Which attribute does it map to?

Feedback

- Allows annotation to multiple models, or versions thereof.
  - Create different 'views' of same data
  - allows for smoother transitions by clients
- Allows clients to ’discover’ content it understands regardless of containing model

- The above were primary drivers for the VO-DML Mapping project

Going Forwad

- Work with TDIG members to generate single model to serialize against.
  - Challenge including non vo-dml models
    - Characterisation (future project to port)
    - PhotDM (simple translation; ~done)
    - Spectral?
- Generate roadmap for working group from TDIG requirements list
- Looking forward to getting feedback on using serializations