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CAOM-2.5 Working Draft

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Overview

- status of CAOM-2.5 model
  - VO-DML model
  - IVOA standard document and process
- status of CAOM-2.5 implementation
  - java libs, python libs
  - postgresql + pgsphere database
  - porting OpenCADC code to 2.5

WD-CAOM-2.5 status

- repository: https://github.com/opencadc/CAOM
  - should move to https://github.com/ivoa-std (summer)
- significant changes
  - change from implicit to explicit observation and plane identifiers (URI)
  - add ArtifactDescription table and reference from Artifact
    - support DataLink implementation
  - remove Part and Chunk from the model
    - increasingly inadequate for describing data file structure
    - improving would increase overlap with CubeDM

WD-CAOM-2.5 status

- significant changes cont.
  - changed several fields to directly use IVOA vocabularies
    - Plane.dataProductType -> product-type (was ObsCore)
    - Artifact.productType -> DataLink core (semantics field)
    - Plane.observable.ucd -> UCD1+
  - added calibration status (vocabulary) for position, energy, time, and observable axes
    - initial vocabulary could be extracted from ObsCore
  - removed Plane.position.timeDependent (boolean) in favour of Telescope.trackingMode (vocabulary)

WD-CAOM-2.5 status

- significant changes cont.
  - added metadata fields to Plane to describe radio data
    - quantities that vary across the field of view: use interval
    - added Visibility characterisation for interferometry data
    - notable: both relative and absolute energy resolution (representative value and interval bounds)
  - Plane energy includes both relative and absolute resolution:
    - resolvingPower: relative (since 2.0)
    - resolution: absolute (new in 2.5)
    - both also described by interval to describe variation across data
  - **no quantities have specified units or reference frames!**
    - external “profile” describes this

WD-CAOM-2.5 standardisation

- meetings with IVOA Data Model WG
  - position CAOM in the IVOA landscape
  - define scope that can be agreed upon
  - define relationship with ObsCore + extensions
- write the document
  - add latex markup to the VO-DML (definitive source)
  - able to build a nice standard document from source
  - updating text style and definitions: more than half done

WD-CAOM-2.5 standardisation

- current issues
  - draft PR to extract re-usable data types from CAOM
    - dataType: interval, point, circle polygon
    - primtiveType: uuid
  - metaChecksum algorithm requires specific numeric-to-byte conversions for interoperability
    - primtiveType: int32, int64, double (names TBD)
      https://github.com/opencadc/CAOM/pull/31
  - relationship between data model vodml-id values and VOTableutype values: vodml-ref = {prefix}:{vodml-id} == {utype}??
    https://github.com/ivoa/vo-dml/pull/46

C is for Common

- CAOM is intended to cover a wide range of use case
  - ret to use mission and wavelength agnostic terminology
  - try to balance specificity vs sparseness

- easy to measure which fields are populated by various missions
  - detailed report of usage of every field, broken down by telescope and instrument (Severin Gaudet)
  - analysis to gather insights current sparseness (in progress)

- hard to measure what scientists actually use

CAOM-2.5 implementation

- java repository: https://github.com/opencadc/caom2
  - feature branch: caom25
  - updated libraries: caom2, caom2-compute, caom2-db (new name)
  - not published to maven-central - build from source
  - notable:
    - improved metaChecksum algorithm
    - core library can read & transform 2.4 observations to 2.5
    - caom2-db: contains the postgresql + pgsphere DDLs and ObsCore views
- python repository: https://github.com/opencadc/caom2tools
  - feature branch: CAOM25
  - not published to PyPI - install from source

CAOM-2.5 implementation

- services: in the opencadc/caom2 repository and feature branch
  - torkeep: CAOM metadata curation service - ported to 2.5
    - docker image: `images.opencadc.org/caom2/torkeep:2.0-BETA`
  - argus: CAOM query (TAP) service - ported to 2.5
    - docker image: `images.opencadc.org/caom2/argus:2.0-BETA`

  - bifrost: CAOM DataLink service - in progress (minimal work needed)
  - icewind: CAOM metadata sync tool - in progress
    - intent is to be able to read from 2.4 and 2.5 source services
    - can improve sync and validation with a standard TAP API

CAOM-2.5 implementation

- repository service prototype: https://ws.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/caom25/torkeep/
- query (TAP) service prototype: https://ws.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/caom25/argus/
- content currently limited to LOTSS radio data
  - once icewind port is complete, we will migrate a sampling of other content to support the IVOA standardisation process
- ivoa.ObsCore and ivoa.ObsCore_radio implemented as views in CAOM-2.5 database, so minimal effort to support

Draft ObsCore + radio implementation

- ObsCore additions (so far)
  - s_fov_min (no max)
  - s_resolution_min
  - s_resolution_max
  - em_resolution (absolute, !f)
  - em_resolution_min
  - em_resolution_max
  - t_exptime_min
  - t_exptime_max
- missing by accident
  - tracking_mode
- ObsCore_radio
  - s_largest_angular_scale_min
  - s_largest_angular_scale_max
  - uv_distance_min
  - uv_distance_max
  - uv_distribution_ecc
  - uv_distribution_fill
- not included
  - instr_*

All code is open-source – docker images are ready to use

Questions?