ADQL Next

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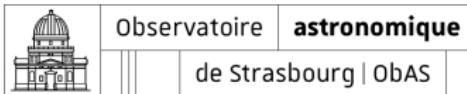
Table of Contents

Features and evolutions

Priorities

Next version

Participation

Features and evolutions

Features and evolutions

PEG Grammar

Boolean support

Hexa. value + bitwise op.

Array/Vector support

Big numerics

MOC support

INTERSECTION function

INTERVAL support

Query by timestamp

Unit annotation

☐ PEG Grammar

- Currently, ADQL provides a BNF Grammar
  - but not machine readable => not possible to validate
  - limitations in the syntax
  - PEG parsers in a lot of languages:
    https://bford.info/packrat/ *(e.g. PEG.js)*
- History:
  - DAL Email: G. Mantelet - 2017-Apr-18
  - Walter Landry slides (Interop May 17, Shanghai)
  - Jon Juaristi slides (Interop May 19, Paris)
  - Jon Juaristi grammar on GitHub repo

☐ **Boolean support**

- 1st attempt in ADQL-2.1 - #32
- Grammar complexity ; may be simpler with PEG

Hexa. value + bitwise op.

- 1st attemp in ADQL-2.1 - #15
- Hexadecimal value (e.g. 0x42)
- Functions or operators (e.g. &, |, ~, <<, >>)?
- **WARNING:** Operation priorities differences from one language to another, signed/unsigned value, . . .
  - See G. Mantelet talk in Oct. Interop 2019 (Groningen)

Array/Vector support

- More and more needed because of surveys like Gaia
- SELECT arrays
    - formatted as specified by VOTable
    - *should there be something in DALI too?*
- WHERE with arrays:
    - [] operator?
    - functions?
- 1 talk on this topic: see Tamara presentation

Big numerics I

- BigDecimal and BigInteger in Java
  - Unscaled precision for BigDecimal
  - Unlimited sequence of digits for BigInteger
  - High precision in storage but also in math. operations
- VOLLT mapping for PostgreSQL:
  - BigInteger -> BIGINT
  - BigDecimal -> DOUBLE PRECISION
  - But loosing precision, if very high or precise values

Big numerics II

- Possible solutions with PostgreSQL:
    1. `BIGINT` *(if the `BigDecimal` value is lower than the max. Long value)*
    2. `BINARY` *(`BigInteger` and `BigDecimal` are stored as bit strings)*
    3. `VARCHAR`

- *Should there be anything about these special types in DALI and VOTable?*

☐ MOC support

- Issue open by Dave M. - #9
- Grégory Mantelet slides (Interop May 17, Shanghai)

☐ INTERSECTION **function**

- Issue from Alberto M. still open - #52
- Add a function to compute the polygonal intersection of 2 given regions

☐ INTERVAL **support**

- Interval/Range of numeric values
- Issue from Pat D. still open - #44
- Terminology issue: `interval` is generally for time whereas `range` is for numerical value
  - but now stuck with the term defined in DALI
- `CAST(...)` can be used to create intervals
  - but a constructor function is also possible
- `INTERSECTS(...)` can be used to set a constraint on a range
  - why not using BETWEEN with a different syntax: mag BETWEEN mag_ranges?

Query by timestamp

- Creation already possible with `CAST('...' AS TIMESTAMP)`
- But no constraint possible
- Suggestions:
  - Equality with = and != (<>)
  - Comparison with <, >, . . .
  - Or functions?
  - Or `BETWEEN ... AND ...`?

Unit annotation

- Annotating literal values add unit metadata in query result

- Example:

  ```
  SELECT 42m AS "random_value_with_unit", ...
  ```

- Also useful for math. operation

  - implicit conversion

  - unit inference

More string functions

- SUBSTRING(...)
- Why not also LEFT() and RIGHT()?

Geometries

- *see OGC standard (OpenGIS® Implementation Standard for Geographic information) for ADQL evolution*

- `DISTANCE` extension between other geometries than `POINT`

- complex regions defined with intersections

Priorities

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Next version

Participation

Priorities for v2.2

1. PEG Grammar *(and validators)*
2. Better support of `INTERVAL` and `TIMESTAMP` *(creation and query)*
3. MOC support *(creation, query and select)* **(collaboration with TAP and DALI)**
4. Array support **(collaboration with DALI)**
5. Substring function

All the other topics?

Next version

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Next version

Participation

Next version

Because of PEG Grammar, **v2.2 or v3.0 ?**

Participation

Features and evolutions

Priorities

Next version

Participation

Participation

- Create an issue in the GitHub repository:

  https://github.com/ivoa-std/ADQL/issues

- Start a discussion in Slack: #adql channel

- . . . or by email: dal@ivoa.net

- Or if too shy, send me directly an email:
  gregory.mantelet@astro.unistra.fr