

WD-DALI-1.2

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What are xtypes?

- latest working draft:

<https://github.com/ivoa-std/DALI>

- last interop covered other changes, use cases, see:

<https://wiki.ivoa.net/internal/IVOA/InterOpMay2023DAL/>

- today: summary of all the xtypes defined in DALI

What are xtypes?

- an additional *optional* attribute on the datatype to indicate that a primitive type can be parsed further to create a “structured” type
- parsed further: currently used with VOTable array values, e.g.

```
datatype="double" arraysize="2" xtype="point"
```

- some uses hampered by limitations on multi-dimensional arrays in VOTable
- xtype can be used to describe input (e.g. parameters) and output (e.g. columns in tabular data)

xtype summary

- xtype="interval" datatype="{numeric}" arraysize="2"
- xtype="interval" datatype="{numeric}" arraysize="2x*"

- xtype="timestamp" datatype="char" arraysize="*" **NEW**
- xtype="uri" datatype="char" arraysize="*" **NEW**
- xtype="uuid" datatype="char" arraysize="*" **NEW**

- xtype="hms" datatype="char" arraysize="*" **NEW**
- xtype="dms" datatype="char" arraysize="*" **NEW**

xtype summary

- xtype="point" datatype="{real}" arraysize="2"
- xtype="circle" datatype="{real}" arraysize="3"
- xtype="polygon" datatype="{real}" arraysize="*" **NEW**
- xtype="range" datatype="{real}" arraysize="4" **NEW**

- xtype="shape" datatype="char" arraysize="*" **NEW**
 - polymorphic: circle, range, polygon

- xtype="moc" datatype="char" arraysize="*" **NEW**
 - refers to MOC-2.0 for ascii serialization format

- xtype="multipolygon" datatype="{real}" arraysize="*" **NEW**
 - multiple non-overlapping simple polygons (union)
 - array serialization separated by special value: NaN

implementation/usage of new xtypes

- various CADDC/CANFAR TAP services use or can make use of:
 - uri
 - uuid
 - shape
 - multipolygon
 - currently using custom xtypes with differences in serialization but minimal work to update when RFC starts
- Vizier can/will update to describe sexagesimal columns:
 - hms & dms
- RegTAP coverage
 - moc
- topcat can make use of all of these to parse input, less figuring out what something is

implementation/usage of new xtypes

- SIA-2.0 and SODA-1.0 param declarations could be improved
 - shape: POS param
- ObsCore-next can make use of one (or several) to replace “adql:REGION”
 - shape: almost direct replacement
 - opinion: allow `s_region` column to be any defined geometry, from specific to general TBD

WD-DALI-1.2 summary

- 8 new xtypes to describe current usage
- relax some restrictions