



Utypes: role and syntax

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IVOA Interop meeting 05/16/2006
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Utypes role

- Reference to a data model:
 - allow software to run some model Class/attribute dependant routines
- Eg: NVO dalclient (getAttribute), Aladin (FootPrint)
- allow to go from a data model instance to Any other document based on this data model
 - from VOTABLE elements to an XML document based on the standard xml implementation of the model
 - Not restricted to VOTABLE



Utypes: STC examples

AstroCoordSys

- for the reference frame:
`AstroCoordSys.SpaceFrame.SpaceRefFrame`
- for the reference position:
`AstroCoordSys.SpaceFrame.ReferencePosition`

AstroCoords

- 2D spatial Position value:
`AstroCoords.Position2D.Value2.C1`



Utypes :STC examples

- AstroCoords

2D spatial Error value

`AstroCoords.Position2D.Error2.C1`

- AstroCoordArea:

Circular region radius: `AstroCoordArea.Circle.Radius`

Circular region center: `AstroCoordArea.Circle.Center.C1`



Utypes in Characterization

- Spatial Coverage:
location `cha:SpatialAxis.coverage.location`.
support: `cha:SpatialAxis.coverage.support`.
- Time Resolution:
Reference Value:
`cha:TimeAxis.Resolution.resolution.RefVal`



A standardized rule ?

- Suppose we have a datamodel D, with public classes c1,c2,c3, sometimes subclasses s? and attributes a?
- So
 - a utype for class c1 is **D:c1**
 - A utype for subclass s1 in class c2 is: **D:c2.s1**
 - and a utype for attribute a1 in subclass s2 in class c3 is **D:c3.s2.a1**
- General form is **D:c?.[s?.*][a?]**



Some ambiguities ?

- But what to do when s is subclass of c and also public class
(`Circle.Radius / AstroCoordArea.Circle.Radius`)
- What to do when s , subclass of c is a component class of another datamodel D' ?
(Error on location position is `characterizationAxis.coverage.location.coord.stc:Position.Error` or just `stc:Coord.Position.Error` ?)
- Do we write `D:s.a` or `D:c.s.a` ?
- Worse do we write `D:c.D':s.a`, or only `D':s.a` ?



Some ambiguities

- Is the role of those attributes the same? Probably not....
- IN VOTABLE we may use hierarchical elements
A GROUP or a Table with utype
D:c
embedding
FIELDS or PARAMS with type **D[']:c**
- And Outside VOTABLE ?



More Complex cases

- Generic classes with possible derivation.
 - AstroCoords for a specific AstroCoordSys, characterizationAxis for a specific ucd
 - Can we have a single mechanism to refer that a FIELD is an RA coordinate with a specific AstroCoordSys FK5 ?
 - A characterization axis is a simulation axis with axisFrame.ucd =phys.mas, ie a Mass axis ?



More Complex cases 2

- Proposed Solution: Combination of utypes in a GROUP

```
<GROUP ucd="pos.eq" utype="stc:AstroCoords" >  
  <PARAM utype="stc:AstroCoords.coord_system_id"  
    datatype="char" arraysize="*" value="UTC-FK5-TOPO"  
  />  
  <FIELDref ref="Col1" />  
  <FIELDref ref="Col2" />  
</GROUP>
```




More Complex cases 3

- Other proposal: xpath syntax was refused
`<FIELD name=«Mass Range» utype=
«Axis.[@axisFrame.ucd=phys.mas].bounds »
datatype=« double » />`
- If we want to have derived classes utypes it as a single string:
 - is it defined in the Data model:
 - is it defined more dynamically?Can we find a mechanism to define it in the serialisation?
(Xml restriction or DEFINITION tag in VOTABLE)