VOTable agenda

2 parts in the session:
➔ Discussion of VOTable-STC connection:
  – a preliminary version (0.5) of a note was published on the IVOA VOTable pages
  – VOTable1.2 XSD *(beta version published)*
  – finalization of the VOTable1.2 document
  – Future of VOTable WG
➔ The question of units (shared with DM)

Referencing Models in VOTable

- The tabular material may contain in its fields (columns) any kind of data
- it is impossible to add into a VOTable document all the various XML codes related to all data models developed by the VO

$\Rightarrow$ VOTable document therefore *refers* to data models without *including* them

Utypes: definition

- in VOTable schema: **utype** is a non-mandatory attribute of any RESOURCE TABLE FIELD PARAM GROUP
    - originally created for DAL needs
    - is an acceptable attribute wherever the ucd accepted
    - contrary to the ucd, gives a fully detailed meaning of the field, parameter or group
        - ucd = broad semantics, typically used for data mining
        - utype = detailed semantics, refers to a data model

Utype: its usage in VOTable

- can supply an exact description of the column contents
- immediate application for referencing quantities *(parameters* and/or *fields)* which exact meaning is crucial
  - systems of coordinates: celestial, terrestrial, solar, ... (connection with STC)
  - time definitions (connection with STC)
  - photometric systems & filters
  - more generally any parameter part of a model, simulation...

Utypes: syntax

prefix:element.element.element...

- namespace-type prefix
- dot-separated list of the elements in the hierarchy of the data model
- to be agreed across IVOA Wgs
  (document in preparation by JMD)

STC Connection

- STC is an essential component to precise the conventions of dates, locations, coordinate systems – now an IVOA Recommendation
- is of interest in most VO components
- in VOTable: replaces (and deprecates) the COOSYS convention

Conclusions of Beijing meeting

- Among the different scenarios proposed, the preference makes use of GROUPs of parameters
- it was decided to write a note dedicated to the VOTable-STC connection

$\Rightarrow$ preliminary version proposed

- Will be included in VOTable1.2

Coordinate components

2 definitions are required (STC nomenclature):
- the coordinate system = AstroCoordSystem
- the actual coordinates = AstroCoord

More generic CooSys and Coords may be used for non-astronomical coordinate frame.

Detailed Coordinate Definition

Done in 2 groups:

- *coordinate system* group with attributes
  - utype="stc:AstroCoordSystem"
  - ID="mySysID"   for referencing
- *coordinate* group
  - utype="stc:AstroCoords"
  - ref="mySysID"   refers the *coordinate system* group
  - ID="myCoords" for referencing

Actual coordinates are in FIELDs

Coordinate components

Defined in FIELD with attributes:
- ref=”myCoords”
- utype=”stc:AstroCoords.*type*.*rep*.*comp*”
    - *type* = Position2D | Position3D | Time
    - *rep* = Value2 | Value3 | TimeInstant
    - *comp* = C1 | C2 | C3 | ISOTime | MJDTime

ID/ref

STC

```
<GROUP
  utype="AstroCoordSystem"
 ID="myFrame" >
 <PARAM name="STC_ID"
  utype="stc:AstroCoordSystem.ID"
  value="UTC_ICRS_TOPO" ... />
...</GROUP>
```

CoordSystem includes sub-groups for time, space, redshift...

```
<GROUP
  utype="AstroCoords"
  ref="myFrame"
  ID="myCoords" >
 <PARAM name="STC_ID"
  utype="stc:AstroCoords.coord_sys_id"
  value="UTC_ICRS_TOPO" ... />
...  </GROUP>
```

ID/ref

```
<GROUP
   utype="AstroCoords"
   ref="myFrame"
   ID="myCoords" >
 <PARAM name="STC_ID"
   utype="stc:AstroCoords.coord_sys_id"
   value="UTC_ICRS_TOPO" ... />
...  </GROUP>
```

```
<FIELD name="RA"
   utype="AstroCoords.Position2D.Value2.C1"
   ref="myCoords"  ... />
```

Examples

- <u>Example 1</u>: List of observations expressed in UTC_ICRS_TOPO
- <u>Example 2</u>: except of the Hipparcos Catalog
- <u>Example 3</u>: Ephemerid of a comet

(see the note_stc.html *document)*

Relations between tables (1)

- One VOTable document may contain several tables, meaning *tables logically grouped*.
- In the relational model, relations between tables are specified via the concept of *keys*
- basic key definitions: *primary key* (non-null, unique) and *foreign key* (must exist as primary in the related table)
- A simple solution: GROUPs

Relations between tables (2)

```
<GROUP name="primaryKey">
    <FIELDref ref="ClusterName">
    <FIELDref ref="GalaxyName">
</GROUP>

...
<FIELD ID="ClusterName" .../>
<FIELD ID="GalaxyName" .../>
```

Relations between tables (3)

```
<GROUP name="foreignKey"
  ref="mainTable">
    <FIELDref ref="ClusterName">
    <FIELDref ref="GalaxyName">
</GROUP>

...
<FIELD ID="ClusterName" .../>
<FIELD ID="GalaxyName" .../>
```

Relations between tables (4)

Other possible interesting details:
- order of the data, e.g. with

  <GROUP name="order" >

  <PARAM name="sequence" value="increasing">

  <FIELDref ref="ClusterName">

  <FIELDref ref="GalaxyName">

  </GROUP>

Relations between tables (5)

- not yet decided: what is better:
  - just a <GROUP> with a specific name ?
  - prefer the definition of some "relational" data model and refer to these groups with utypes ?
- to be included in VOTable1.2 ?

Future of VOTable

After VOTable 1.2
- To keep as a Working Group ?
- Need maintenance ? Volunteers ?