

VOTable agenda

- Short presentations:
 - Pierre Fernique: *VOTable1.2 implementation feedbacks*
 - Rick Wagner: *Using nested RESOURCE elements*
 - Last adjustments of VOTable1.2 :
 - new attribute to store an *extended/external datatype*: votype ? xtype ?
 - Recommended mime type
 - STC connection
 - Questions / problems with VOTable-1.2-beta
 - Future of VOTable WG
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TAP Connection: the problem

2 entities in TAP need clear identification in TAP context:

- **TIMESTAMP** (exists in RDBs, but no uniform definition – most however accept ISO-8601 representation in SQL and result, but leap seconds / time zones not taken into account)
- **REGION** (and **POINT**) – for ADQL queries



How to express *TIMESTAMP* ?

- (a0) Restrict the expression of time to JD or MJD or ... number
 - (a1) Create a new attribute (which name ? which content?)
 - (a2) Create a new datatype (equivalent to 'char' as far as the data storage is concerned, with an arraysize reflecting the accuracy, i.e. '19' for full date YYYY-MM-DDThh:mm:ss)
 - (a3) Use a utype related to the STC data model
(e.g. utype='stc:AstroCoords.Time.TimeInstant.ISOTime')
 - (a4) Use a UCD (e.g. ucd='time.iso8601'; could be secondary
e.g. ucd='time.release;time.iso8601')
 - (a5) Use a special unit (e.g. unit=""iso8601"")
 - (a6) No, use STC-S string [from Arnold] e.g.
'Time TT GEOCENTER 2009-05-13T19:09:30'
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How to express *TIMESTAMP* ?

- (a0) [just number allowed as (M)JD, s/origin,...]
Yes (2) (still needs differentiation from elapsed time)
 - (a1) [new attribute, initial TAP proposal]
Yes (1) (poor usage of an attribute)
 - (a2) [new datatype]
Yes (1) No (1) (incompatibility with FITS datatypes)
 - (a3) [utype='stc:AstroCoords.Time.TimeInstant.ISOTime']
Yes (1) No (1) (single utype, complex to dig out)
 - (a4) [UCD] (e.g. ucd='time.release;time.iso8601')
[could be acceptable by Semantics group?]
Yes (4) No (1) (complex to dig out?)
 - (a5) [Unit] Yes (4) No (1) (abuse what's a unit?)
 - (a6) [STS-C] Mostly no
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TIMESTAMP & POINT/REGION

- From mail discussion, 2 options clearly preferred:
 - **unit** (no interference with semantics) e.g.
unit='iso8601'
 - **ucd** (need ucd adaptation)
 - From TAP meeting, the choice is a new attribute
 - which name: **votype xtype externaltype**
 - value contents:
 - qualified, e.g. TAP:iso8601 tap:point
 - generic, e.g. iso8601 point region STC-S
 - questions:
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Possible Example

```
<PARAM name='myRegion' datatype='char'  
arraysize='*' xtype='STC-S'  
value='CIRCLE ICRS BARYCENTER 148.9 69.1 2.0'>
```

- choice of name
 - should we say anything about the value ? Or let the final application decide ? Make recommendation ?
 - new attribute of **FIELD PARAM INFO** ; maybe **GROUP** ?
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The Question of VOTable Mime-Type

- Currently Recommended in VOTable1.2-draft:
application/x-votable+xml
 - other possibilities discussed in TAP session:
 - text/x-votable+xml
 - text/xml; content=x-votable+xml
 - test at <http://cdsarc.u-strasbg.fr/cgi-bin/catmime>
 - if several acceptable mime types:
 - choice by the server? the application ? with default XSLT convertor ?
 - **text** for <TABLEDATA> and **application** for <BINARY> ?
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STC-Connection (Epoch)

- *Epoch* of coordinates is still missing in STC (reference *time location* in a *spatial* coordinate frame)
- in the *Note Referencing STC in VOTable*:

```
<GROUP ID="HIPcoo" utype="stc:AstroCoords" ref="HIP">  
  <PARAM name="epoch" datatype="char" arraysize="*" unit="yr"  
    utype="stc:AstroCoords.Position.Epoch"  
    value="J1991.25" /> <!-- Julian time scale ?? (1) -->  
  <FIELDref ref="RA1"/> <!-- second referencing, optional -->  
  <FIELDref ref="DE1"/> <!-- second referencing, optional -->  
  <FIELDref ref="pm1"/> <!-- second referencing, optional -->  
  <FIELDref ref="pm2"/> <!-- second referencing, optional -->  
</GROUP>
```

Epoch specification (continued)

- 2 times in use:
 - Besselian (1yr = 365.242198781 days)
 - Julian (1yr = 365.25 days)
 - Difference is not negligible: `2009-05-28 = J2009.4029 = B2009.4044` and the difference is ever increasing
 - not satisfactory to specify a number with `datatype='char'`
- ⇒ there should be a distinction in STC
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Epoch specification (solution1)

- Preferred way: a distinction between the 2 time scales:

```
<GROUP ID="HIPcoo" utype="stc:AstroCoords" ref="HIP">  
  <PARAM name="epoch" datatype="double" unit="yr"  
    utype="stc:AstroCoords.Position.Jepoch"  
    value="1991.25" /> <!-- Julian time scale ?? (1) -->  
  <FIELDref ref="RA1"/> <!-- second referencing, optional -->  
  <FIELDref ref="DE1"/> <!-- second referencing, optional -->  
  <FIELDref ref="pm1"/> <!-- second referencing, optional -->  
  <FIELDref ref="pm2"/> <!-- second referencing, optional -->  
</GROUP>
```

Epoch specification (solution)

- Alternative way: a scale parameter :

```
<GROUP ID="HIPcoo" utype="stc:AstroCoords" ref="HIP">
  <PARAM name="epochScale" datatype="char"
    utype="stc:AstroCoords.Position.epoch.scale"
    value="J" /> <!-- Julian time scale -->
  <PARAM name="Jepoch" datatype="double" unit="yr"
    utype="stc:AstroCoords.Position.epoch"
    value="1991.25" /> <!-- Julian time scale ?? (1) -->
  <FIELDref ref="RA1"/> <!-- second referencing, optional -->
  <FIELDref ref="DE1"/> <!-- second referencing, optional -->
  <FIELDref ref="pm1"/> <!-- second referencing, optional -->
  <FIELDref ref="pm2"/> <!-- second referencing, optional -->
</GROUP>
```

Questions & Answers

Questions raised:

- accept any additional attribute in FIELD
`<xs:anyAttribute namespace="##other" />`
(could result in serious lack of interoperability; VOEvent?)
 - multiple ucds / utypes
 - issues raised with VOTable1.2
 - **INFO** changes
 - **GROUP** possible as children of **VOTABLE** and **RESOURCE**, in addition to **TABLE**
 - several **DATA** children in a **TABLE** ?
 - **TR** has an **ID** attribute
 - **TD** element has an **encoding** attribute
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Multiples UCDs or utypes ?

- In some contexts could be useful to assign more than 1 utype or ucd to a **FIELD** or **PARAMeter**
 - is it really a requirement ?
 - within the same data model ?
 - may a **FIELD** has several facets (e.g. utype has a role in several data models) ?
 - Always possible to add a **GROUP** which adds other facets:
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```
<GROUP name='modelA' utype='modA:shutterControl' >
  <FIELDref utype='modA:shutterControl.time.start' ref='col1' >
    ....
  </GROUP>
...
<FIELD ID='col1' name='myEvent' datatype='double'
  utype='stc:AstroCoords.Time.TimeInstant.JDTime'>
  <DESCRIPTION>
    Time of event as it occurred
  </DESCRIPTION>
</FIELD>
....
```



<INFO> Change

- In V1.1: <INFO name='...' value='...> text </INFO>
 - In V1.2: <INFO name='...' value='...>
 <DESCRIPTION> text
 </DESCRIPTION></INFO>
 - made as a restriction of PARAM in Beijing (2007)
 - may contain sub-elements and therefore may be expanded if necessary (no sub-element permitted in V1.1)
 - location of INFO tag in several place (also post-result)
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<GROUP> controversy

- may occur as a direct child of **VOTable**, **RESOURCE**, **TABLE**, **GROUP**
- was defined in VOTable1.1
- is it a problem ?



XML-Schema questions

- May several **<DATA>** be included in a **<TABLE>** ?
 - **<TR>** has an optional **ID** attribute (was required for some code generators)
 - **<TD>** has an optional **encoding** attribute (corresponds to Appendix A5)
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XML-Schema: VOEvent way

- <http://www.cacr.caltech.edu/hotwired>
- <http://lyra.berkeley.edu/dokuwiki/doku.php?id=tcp:vo:votimeseries>
- <http://lyra.berkeley.edu/dokuwiki/doku.php?id=tcp:vo:votimeseries:vo03-alt4>



```
<VOTIMESERIES version='0.03-alt4'>
```

```
<TIMESYS>
```

```
<TimeType ucd='time;pos.frame;pos.heliocentric'>mjd</TimeType>
```

```
<TimeZero ucd='time.epoch;arith.zp'>0.0</TimeZero>
```

```
<TimeSystem ucd='frame.time.scale'>UTC</TimeSystem>
```

```
<TimelsFolded datatype='boolean'
```

```
description='set True if the time axis is folded by a period'>False
```

```
</TimelsFolded>
```

```
<Period ucd='time.period' unit='day'></Period>
```

```
</TIMESYS>
```

```
<RESOURCE name='edu.berkeley.lyra:tcp:lc:source21237' ]
```

```
xmlns='http://www.ivoa.net/xml/VOTable/v1.2/beta'>
```

```
<TABLE id='edu.berkeley.lyra:tcp:lc:R:table15047' ucd='em.opt.R'>
```

```
<FIELD name='t' system='TIMESYS' ucd='time.epoch' datatype='float' unit='day'/>
```

```
<FIELD name='val' ucd='phot.mag;R' datatype='float' unit='mag'/>
```

```
<FIELD name='v_err' ucd='stat.error;phot.mag;R' datatype='float' unit='mag'/>
```

```
<FIELD name='limit' ucd='obs.param' datatype='char' arraysize='5'>
```

```
<VALUES>
```

```
<OPTION value='false' />
```

```
<OPTION value='upper' />
```

```
<OPTION value='lower' />
```

```
</VALUES>
```

```
</FIELD>
```

```
....
```

VOEvent way: foreign structures?

Should VOTable accept foreign definitions like the
<TIMESYS> ?

- pro:
 - expand the usage of VOTable
 - applications knowing VOTable can understand (topcat, aladin)
- con:
 - too lax schema \Rightarrow less interoperability ?



Future of VOTable WG

After VOTable1.2 is a REC:

- become dormant WG ?
- Need maintenance ? Volunteers ?

