Fig. 1

Fig. 2

Fig. 3

1. VODataService 1.2 WD

(cf. Fig. 1)

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(cf. Fig. 2)

- Motivation
- STC coverage
- Additional metadata for columns and tables
- Data collection review
- DALI interface: sync/async
- TAP/VOTable compatibility

There is now a first WD for VODataService 1.2 out; this is a brief report on why we want a 1.2 version on what's been done so far.

(cf. Fig. 3)

2. New Use Case 1

What services have data for the Crab nebula covering
the Hα line taken in the second half of 2015?

In via new `coverage` children, implementation available.

3. New Use Case 2

Find all ObsCore services publishing data
taken at the Telescope X.

That's as described by Discovering Data Collections. VODataService provides new types (primarly `vs:CatalogResource`). Implemented.

4. New Use Case 3

Find a large-scale survey of sources
between 20 and 40 GHz

Not straightforward to operationalise. New `nrows` child on `table` is in and implemented. That's probably already pretty useful if widely taken up; a resource listing some 1e4 quasars probably is a large-scale survey, or one giving 1e9 ordinary stars, or one giving 1e4 Cepheids.

5. New Use Case 4

Find a resource that has sources in M51
down to 27 mag in V.

Not in yet. Could be done if we simply adapted the VOTable VALUES element for our `vs:BaseParam`. This would also be useful to better describe input parameters to services in capabilties; so far we've been used hacks like FORMAT=METADATA request parameters for this kind of thing – it might be progress to get rid of these.

6. New Use Case 5

Plan a cross-service query.

This requires histograms, NULL ratios and other column metadata. Which is great user information, too.

Someone would need to do the work here or we'll drop this one.

7. New Use Case 6

Find services serving time series

The model "Want spectra? Use SSAP?" doesn't work any more with increasing takeup of ObsTAP. So, we'll probably need some way to indicate the types of data products that some resource contains. Perhaps just `dataproduct_types` distinct values would solve it (≈ use case 4)? Unhandled yet.

8. New Use Case 7

Facilitate discovery of full DALI services

These may have both sync and async endpoints, and there's the VOSI endpoints – how does all this map to capabilities and interfaces? Discussion mainly in GWS (cf. UWSRegExt). Nothing in VODS 1.2 yet.

9. Coverage

Essentially as discussed in Shanghai and the accompanying note ("STC in the Registry"), except spectral is energy right now:

```
<coverage>
  <spatial>
    4/2068
    5/8263,8268-8269
    6/33045-33047,33049,33051,33069,33080-33081,
    33083,33104-33106,33112,33124-33126,33128-33130
  </spatial>
  <temporal>51845.1 52262.2</temporal>
  <temporal>54332.2 54812.2</temporal>
  <spectral>1.8e-19 6.6e-19</spectral> <!-- NEW: E! -->
  <footprint ivo-id="ivo://ivoa.net/std/moc"
    >http://dc.g-vo.org/cdfspect/q/ssa/coverage</footprint>
  <waveband>Optical</waveband>
</coverage>
```

So, the coverage declaration consists of:

- At most one ASCII MOC for spatial coverage
- Zero or more MJD intervals and zero or more intervals of particle energy for time and spectrum
- Zero or more links to footprint services (these could return finer-grained MOCs)
- Zero or more qualitative waveband indications

We moved from the original wavelength in meter to energy because that's the only sane measure in a multi-messenger world (and wavelength always sucked because so many wavelengths out there are actually air wavelengths).

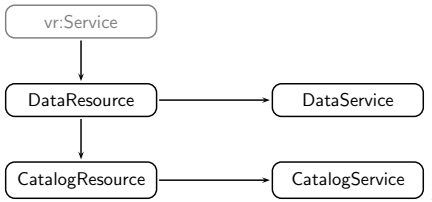

Fig. 4

10. Coverage: Open Points

- Where do we put the norm on ASCII MOCs?
- Spatial coverage on planets and other non-sky things?
- Waveband terms for non-EM messengers?

11. Additional Metadata

So far, there's just the (approximate) number of rows on a table as metadata.

There are use cases for having for (at least some) columns or parameters:

- minima, maxima
- distinct enumerated values
- NULL ratio
- histograms

Default action: simply add VOTable-style VALUES metadata.

12. Data Collection Review

So far, most of the VO assumes there's 1:1 between data and services. But: Many services today serve 100s of resources.

Solution: see Discovering Data Collections; we need a data collection type with capabilities:

(cf. Fig. 4)

Essentially: DataService and CatalogService got xResource companions to use for data-like resources. Content models are the same.

DataCollection is deprecated.

The difference between DataResource and CatalogResource is, as before, that that latter has a tableset. Hence, most useful data resources will probably use the CatalogResource type (just as today, there's just 28 DataServices vs. 2e4 CatalogServices).

13. DALI Interfaces

In particular in the context of authenticated services, we'll (probably) have to describe an endpoint structure like:

```
/capabilities
/tables-secret
/sync-secret
/async-secret
/tables
/sync
/async
```

See Mark Taylor's talk over in the auth TAP session for what we think is a good way forward.

14. TAP/VOTable Compatibility

VODataService is part of TAP via VOSI tables.

To keep up with TAP 1.1, we

- deprecate TAPType (use VOTableType instead as in TAP_SCHEMA)
- demand delimited identifiers where there's a SQL context

Also, arraysize prose is updated for VOTable 1.3 erratum 3.

15. Roadmap

Next WD: spring 2019, including additional column metadata.

Beyond that: depends on progress in working out the authentication vs. sync/async drama.