productTypeServed in VODataService

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The Use Case: Global dataset discovery

“Give me all services publishing astronomical images”

This used to be: “Give me all SIAP services”.
With ObsTAP, SIAP1, SIAP2, and possibly plain TAP, that’s a thing of the past.
Also: Polyvalent protocols like ObsTAP or (in practice) SSAP need to be explicit on what product types they serve.
In the current VO, there at least 3 SSAP services that really serve time series. With SSAP’s successor, expected to be good for all product types that Obscore is good for, being explicit about the product types will be as important there as it already is in ObsTAP.

Proposed Solution

Add a productTypeServed element to VODataService’s DataResource type:

```xml
<ri:Resource status="active" xsi:type="vs:CatalogResource">
  <title>DaCHS Development Site Obscore Table</title>
  <shortName>GAVO DC Obscore</shortName>
  <identifier>ivo://org.gavo.dc/__system__/obscore/ObsCore</identifier>
  ...<curation>
    ...<temporal>12414.256 63023.51852</temporal>
    <spectral>2.820522229e-29 1.603508989e-08</spectral>
  </coverage>
  <productTypeServed>cube</productTypeServed>
  <productTypeServed>image</productTypeServed>
  <productTypeServed>spectrum</productTypeServed>
  <productTypeServed>timeseries</productTypeServed>
</ri:Resource>
```

RegTAP Aspects

Getting data providers to reliably adopt this would take forever. Hence, RegTAP 1.4 should say:

- Resources with SIAP1 or SIAP2 capabilities get image unless they define productTypeServed
- Resources with SSAP get spectrum unless they define productTypeServed

“Get image”?

Where would productTypeServed sit in RegTAP?
Simple plan: use a /productTypeServed xpath. Hence, to find all resources serving images, you would say:

```sql
SELECT ivoid
FROM rr.res_detail
WHERE detail_xpath='/productTypeServed'
  AND detail_value='image'
```

Getting Fancy

With the gavo_vocmatch UDF available on reg.g-vo.org, you could even say “Give me anything that is spatially resolved”:

```sql
SELECT ivoid
FROM rr.res_detail
WHERE detail_xpath='/productTypeServed'
  AND 1=gavo_vocmatch(  'product-type',
                      'spatially-resolved-dataset',
                      detail_value)
```

Perhaps go for ivo_vocmatch and require it for RegTAP?

Implementation Status

DaCHS 2.9.4 and later can produce productTypeServed and will do that automatically for obscore records.
The rest would – famous last words – be quick to do at least for reg.g-vo.org and pyVO.