VOQuest

A tool to consume Source Catalog Data Model aware services

Inaki Ortiz

Applications
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Inaki.Ortiz@esa.int

European Space Astronomy Centre (ESAC)
**Villafranca del Castillo, MADRID (SPAIN)**

What is VOQuest?

❑ A prototype client tool to query Source Catalog Data Model aware services.

❑ Makes use of a bunch of VO standards and protocols like:

- ADQL

- SkyNode

- Source Catalog Data Model (SCDM)

- VOTable

- PLASTIC

❑ Interoperates with VO client applications like VOSpec, Topcat and Aladin through PLASTIC.

- Relegates functionality already present in these tools in a more mature state.

❑ Its open architecture can provide access to services implementing a specific data model through ADQL.
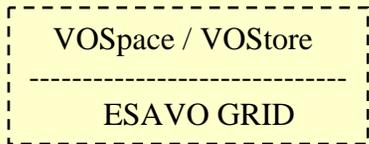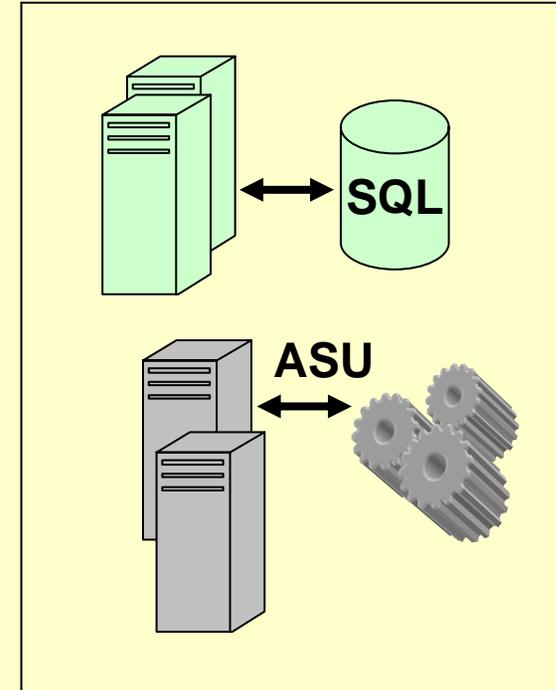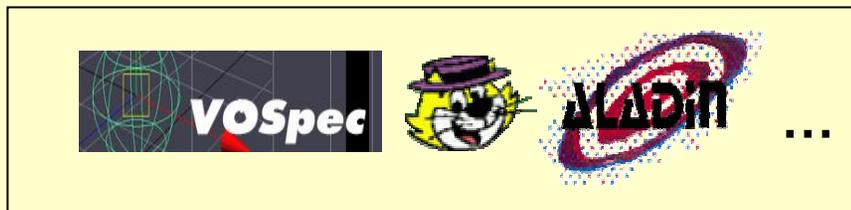
Overall architecture

SkyNodes + SCDM
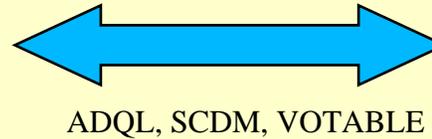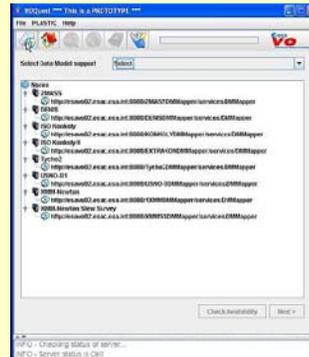
VOQuest

ADQL, SCDM, VOTABLE

SQL

ASU

VOSpace / VOStore

ESAVO GRID

VOTABLE

PLASTIC Hub

PLASTIC Applications

VOSpec   ...   ALADIN   ...

Access to Source Data Model

❑ VOQuest can search on heterogeneous catalogs through ADQL.

- Same ADQL query is sent to all SkyNodes implementing the SCDM.

- Knowledge about specific database model of each SkyNode is no longer needed.

- See talk by Aurelien Stebe: DM5, VOQL3. Fri 19.

❑ Query can be as complex as ADQL and SCDM allows.

Heterogeneous set of catalogs

VOQuest

ADQL + SCDM

SQL

ASU
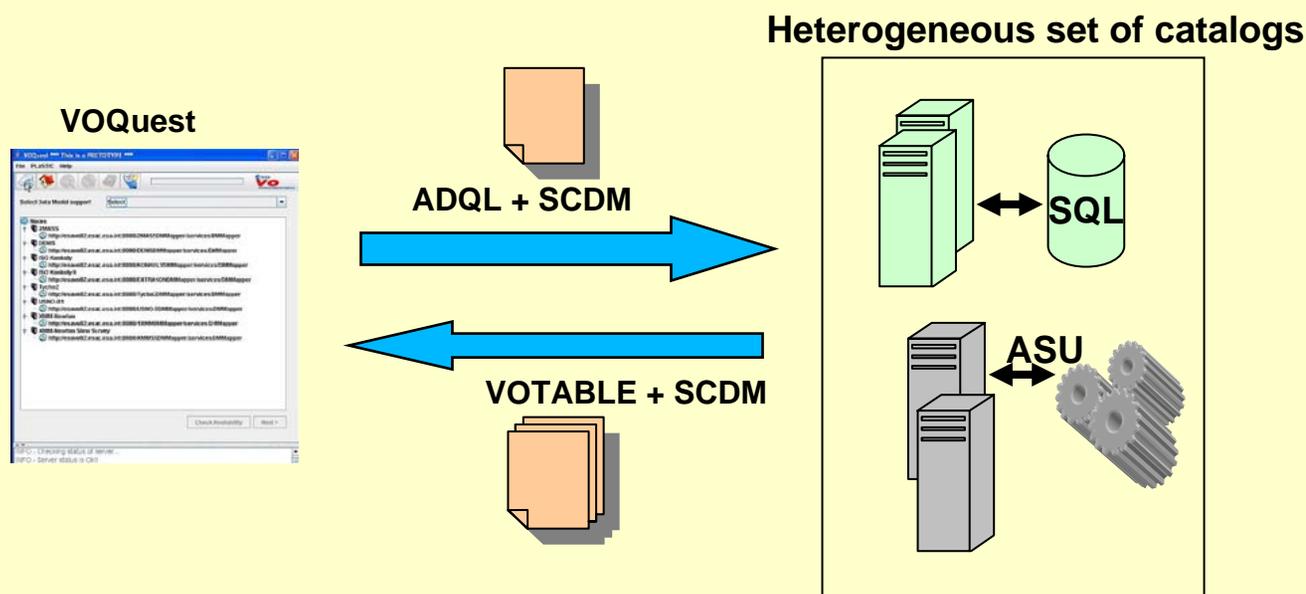
VOTABLE + SCDM

Interoperability through PLASTIC

❑ PLASTIC stands for PLatform for AStronomical Tool InterConnection.

  ▪ http://plastic.sourceforge.net/

  ▪ See talk and demos by Taylor and Boch: Applications 3. Wed 17, 9:00-09:40.

❑ VOQuest uses PLASTIC to send VOTable results from SCDM aware services to several VO tools like VOSpec, Topcat and Aladin.

❑ Interoperability Use Cases:

  ▪ Catalog Cross Match.

    ✓ Results by VOQuest and catalog cross match performed by Topcat.

  ▪ Spectra superimposition

    ✓ Results generated by VOQuest and spectra displayed by VOSpec.

  ▪ Photometry handling

    ✓ Results generated by VOQuest and photometry handled by VOSpec.

Use Case I: Catalog Cross Match

❑ VOQuest searches for sources within a circular region of the sky.

❑ All SkyNode + SCDM services supporting source coordinates are being queried.

❑ Results are sent to Topcat for display and, finally, the cross match is being performed on that region.

Use Case II: Spectra superimposition

❑ VOQuest searches for flux and wavelength in the vicinity of star Vega (radius=1')

❑ All SkyNode + SCDM services supporting source flux and wavelength are being queried.

❑ Results are sent to VOSpec to perform the display and check that they match with theoretical and SSAP spectra.

Use Case III: Photometry handling

❑ VOQuest searches for photometry in bands J and K in the vicinity of Vela supernova (radius=1')

❑ All SkyNode + SCDM services supporting photometry in J,K bands are being queried.

❑ Results are sent to VOSpec to perform the display and check that they fit with other SSAP results.

Further implementation

❏ More to come…

- Complete User Interface to build ADQL queries following the SCDM model.

    ✓ SOAP access to services is already there.
    ✓ Server implementation already supports any kind of complexity in search.
    ✓ Graphical query builder to be completed (TreeView or Constellation Charts technology).
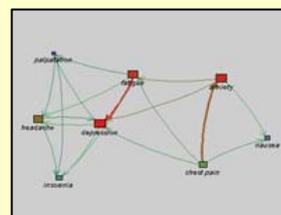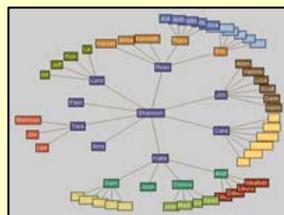
- Integration with ESAVO Grid through raw relegation (VOStore later?)

Conclusions

- A framework is already present to access services implementing a data model through ADQL.
- Three different use cases demonstrates the usefulness of SCDM.
- Heterogeneous catalogues (Vizier, ESAC) can be now accessed uniformly.
  - One single query, multiple homogenized results to be consumed by external applications through PLASTIC.
  - Knowledge on specific SkyNode back-end model is no longer required to build an ADQL query.
- Open issues:
  - VOTable fits well for flat structured data. What about complex structures (ideal to represent data model output)?
  - Photometry model is missing and could be easily consumed by VOQuest.

Technical details

❑ For those interested in the implementation…

- 2-tier Java webstart application accessible at: http://esavo02.esac.esa.int:8080/VOQuest/voquest.jnlp

- Communication protocol: XML-RPC over HTTP.

- Lightweight client (< 1Mb).

- Usage of Starlink PLASTIC implementation.

- XML-RPC server running embedded into Tomcat.

- AXIS to access SkyNodes + SCDM (DMMapper).

- Performance issues:
  - ✓ Supports asynchronous and multi-threaded requests.
  - ✓ Intensive processes (SOAP, Grid interface) in server side only.

- Interoperability: standard XML-RPC implementation
  - • No vendor extensions (HTTP 1.1 compression, content header…)
  - • Open to clients in many other languages: .NET, PHP, Python…