VOQuest
A tool to consume Source Catalog Data Model aware services

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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

ESAVO GRID

VOSpace / VOSTore

PLASTIC Hub

VOTABLE

PLASTIC Applications

VOSpec

ALADIN

Applications
May 2006, Victoria, Canada

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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.

![Diagram of VOQuest and data models]

VOQuest

Heterogeneous set of catalogs

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Interoperability through PLASTIC

- PLASTIC stands for PLaatform for AStronomical Tool InterConnection.
  - 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…