Taverna Plugin
VAMDC and HELIO
(part of the ‘taverna-astronomy’ edition)

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Introduction

• VAMDC – Atomic and Molecular Data Centre. Main goal to build interoperable e-science environment-based interface. Targeting 17 existing A+M databases. Had no service interface and many no relational database. Allowed to define a common data model and ingestion into database along with a common interface.

• Heliophysics explores the Sun-Solar System. Provides an infrastructure to explore more than 200 instruments, propagation model, and other Heliophysics catalogues such as specific Event Catalogues. Much of the data already had services, required a ‘façade’ layer to give HELIO clients a common query interface.

• Web based GUI were built, but a need to run workflows was evident. Helio employed people from Taverna in the beginning. Kevin Benson who had experience with Taverna implemented two separate plugins for each of these domains.
Plugin Goals

- Discover Services
- Query Interface
- Run Application Codes
- Provide Utility Services if needed.

**NEW (Components): From Carole talk. Some of the plugins ‘could’ be converted to ‘Components’**

How to Reach these Goals?
Discovery → Registry (IVOA)

- Metadata that describes Resources. Such as a Service, Catalogue, Specific Service (i.e. Cone Search, SIA), Registries.

- Publishing Registries are established that manage a particular set of Resources usually for that institute.

- Full Registries contain all Resources and harvest the publishing registries.
Discovery → Registry (IVOA)

• 4 Key areas about the registry (*Optional):
  • Identifier: <identifier>ivo://vamdc.eu/hitran/service</identifier>

• Core Metadata – Contact, Description, Subject, Date

• *Service Capabilities:
  <capability standardID="ivo://helio-vo.eu/std/LongFullQuery/Soap/v1.0">
    <interface xsi:type="vr:WebService">
      <accessURL use="full">http://helio.mssl.ucl.ac.uk/helio-hec/HelioLongQueryService</accessURL>
      <accessURL use="full">http://festung1.oats.inaf.it:8080/helio-hec</accessURL>
    </interface>
  </capability>

• *Application Input&Output metadata
  Table and Column Metadata

  Standard ID. Usually goes with a specification

  Location of the Service including mirrors.
Taverna Plugin

• With Resources being discoverable in a Registry. The plugin can do a query to the Registry following the IVOA Registry Interface Spec to discover the necessary Metadata and construct ‘Services’ into the Services panel.
Querying of a Service

- Both Helio and VAMDC support an IVOA protocol called TAP (Table Access Protocol).
- Responses are different in that HELIO returns an IVOA standard called VOTable. VAMDC has a particular AM data model that is more established called XSAMS. Both are XML based.

- IVOA_TAP (Helio) shows a few more common ports that are used to query in Helio.
  - ‘Reference’ is a boolean true if you only want a URL link. False if you want the results back to Taverna.
  - ‘Query’/’Where’ are similar SQL style queries.

URL/Ivorn is a key input, tells it the location of the query service.
- URL → URL to the service, maybe even a test url not in the registry.
- Ivorn/Identifier from the Registry → Whereby the plugin will look up an ‘available’ service in the Registry.
- Note: Services Panel has known Services from the Registry available that have ‘output’ ports of an Ivorn (or URL) to be fed as ‘input’ into these TAP Services.
Running Applications

• VAMDC and Helio both have a desire to run particular command line based Applications.

Example of a few:
  • Flare Plotting
  • Spectrum fitting
  • Coordinate Transformation
• Both call a UWS Restful type service from the IVOA. Taverna plugin can do all the complicated calling and polling for the application to be completed.

• Again the Registry can provide the needed inputs and outputs.
Utilities and Helper Services

- Utilities and Helper Services are provided with VAMDC and Helio plugins. The main area is converting results into different formats (Consumer Services).
  - **AstroTaverna** → [http://www.taverna.org.uk/2013/06/20/astrotaverna-plugin/](http://www.taverna.org.uk/2013/06/20/astrotaverna-plugin/)
    - Another plugin AstroTaverna has a wide range of features that are very useful individually or combing with the Helio/Vamdc plugins. Most recognized of use:
    - VOTable data such as fetching/parsing/visualizing. Including Cross-Match.
    - Calling VOServices → Cone, Simple Image Access, and Simple Spectral Access. Services again found from an IVOA Full Registry.
    - Parameter Description Language Services (newish). Calling more complicated applications.
Example of all services. Walk-through
Conclusions

• Workflows are in myExperiment. Need to add more from Helio side that use the plugin.
• Learn more at this workshop and upgrade plugins.
• Cleanup – Maven and logging.
• No ‘real’ funding for Development work at this time. Proposals in the works.

• VAMDC
  • [http://vamdc.mssl.ucl.ac.uk/taverna/vamdc/plugins](http://vamdc.mssl.ucl.ac.uk/taverna/vamdc/plugins)

• HELIO
  • [http://twiki.mssl.ucl.ac.uk/twiki/bin/view/Software/HelioTavernaInstallationGuide](http://twiki.mssl.ucl.ac.uk/twiki/bin/view/Software/HelioTavernaInstallationGuide)
  • [http://msslkz.mssl.ucl.ac.uk/helio_taverna/taverna/helio/plugins/](http://msslkz.mssl.ucl.ac.uk/helio_taverna/taverna/helio/plugins/)