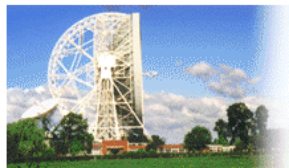


# Workflows in Astrogrid with Taverna

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(contact via e-mail if you wish to install plugins before official  
release)



Jodrell Bank  
Observatory



# Talk Outline

- Taverna
- AstroRuntime
- Demo

# Taverna

- The Taverna workbench is a free software tool for designing and executing workflows, created by the myGrid project.
- Allows a biologist or bioinformatician with limited computing background and limited technical resources and support to construct highly complex analyses over public and private data and computational resources, all from a standard PC, UNIX box or Apple computer.
- The myExperiment social web site supports finding and sharing of workflows.
- But with a nice plug-in architecture that Taverna has plugins are being built to connect to the VO community. ESO uses a tool called Reflex in implementing data reduction pipelines via Taverna. JVO will have a plugin connected to Taverna in the near future. AstroGrid have developed a plug-in adaptor for Taverna, thereby exposing the standard range of IVOA standard services, thus those for images (SIAP), spectra (SSAP), tables (TAP), and applications (CEA-Common Execution Architecture) to Taverna.
- <http://taverna.sourceforge.net/>
- <http://www.myexperiment.org/>

Taverna File Tools Workflows Advanced

Taverna Workbench v1.5.1.6

Design Results Discover

Search Watch loads

Local Services

- Notification Processor
- Local Java widgets
  - String Constant
  - BSF scripting host
  - AbstractProcessor - Processor for abstract taskdescriptions
  - RShell - Run R/S scripts through RServe
  - Beanshell scripting host
- WSOL @ http://www.ebi.ac.uk/collab/mygrid/service1/goviz/GoViz.jws/wsdl
- WSOL @ http://eutils.ncbi.nlm.nih.gov/entrez/eutils/soap/eutils.wsdl
- WSOL @ http://soap.bind.ca/wsdl/bind.wsdl
- WSOL @ http://www.ebi.ac.uk/ws/services/urn:Dbfetch/wsdl
- WSOL @ http://soap-genome.jp/KEGG.wsdl
- WSOL @ http://www.ebi.ac.uk/xembl/XEMBL.wsdl
- Biomart service @ http://www.biomart.org/biomart
- Biomoby @ http://mobycentral.licapture.ubc.ca/cgi-bin/MOBY05/mobycentral.pl
- SeqHound @ seqhound.blueprint.org
- Soaplab @ http://www.ebi.ac.uk/soaplab/emboss4/services/

Advanced model explorer

Workflow Object properties

Add Nested Workflow Offline

Workflow object	Retrie	Delay	Backoff	Thread	Critical
BiomartAndEMBOSSAnalysis					
Workflow inputs					
Workflow outputs					
outputPlot					
HSapiDs					
MMusIDs					
RNorIDs					
Processors					
FlattenImageList	0	0	1	1	
getMMsequence	0	0	1	1	
getRNsequence	0	0	1	1	
getHSsequence	0	0	1	1	
hsapiens_gene_ensembl	0	0	1	1	
GetUniqueHomolog	0	0	1	1	
CreateFasta	0	0	1	1	
seqret	0	0	1	5	
emma	0	0	1	5	
plot	0	0	1	5	
Data links					
CreateFasta.fasta-seqret:sequen					
GetUniqueHomolog.HSOut-getHS					
GetUniqueHomolog.MouseOut-gi					

Save diagram Refresh Configure diagram

```

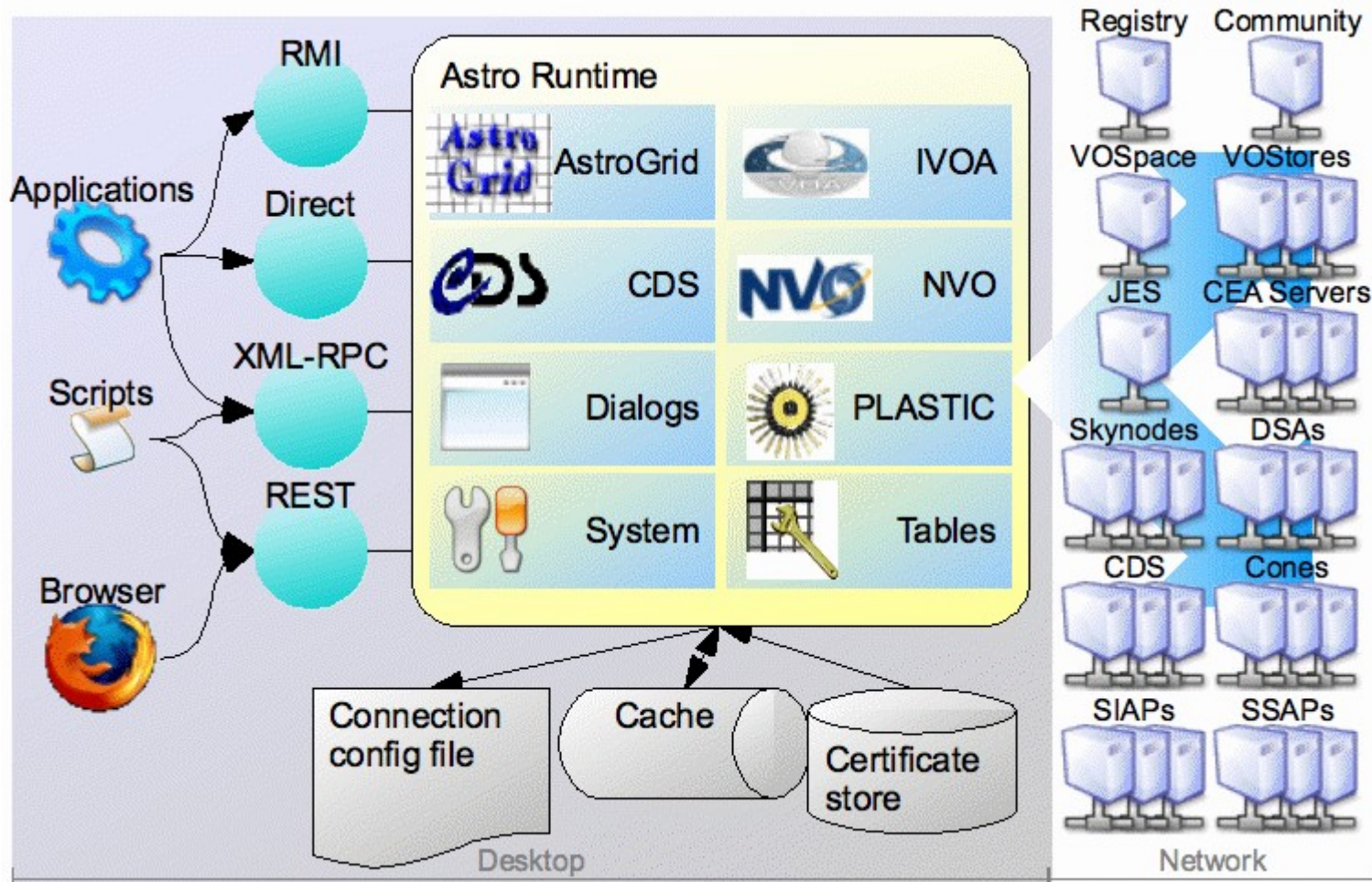
graph TD
    A[hsapiens_gene_ensembl] --> B[GetUniqueHomolog]
    B --> C[getMMsequence]
    B --> D[getRNsequence]
    B --> E[getHSsequence]
    C --> F[CreateFasta]
    D --> F
    E --> F
    F --> G[seqret]
    G --> H[emma]
    H --> I[plot]
    I --> J[FlattenImageList]
    J --> K[outputPlot]
    J --> L[HSapiDs]
    J --> M[MMusIDs]
    J --> N[RNorIDs]
  
```

Rendering done.

# Astro Runtime

- A client-side library of functions to access VO
  - scope: integrate all VO standards, popular ad-hoc services, suitable helper functions
- Library is exposed as a desktop service
  - accessible from almost all programming languages
    - XMLRPC, HTTP, RMI, C-binding
- API designed to use consistent abstractions and types
  - shallow learning curve
  - Insulates from change.

# Astro Runtime - Schematic



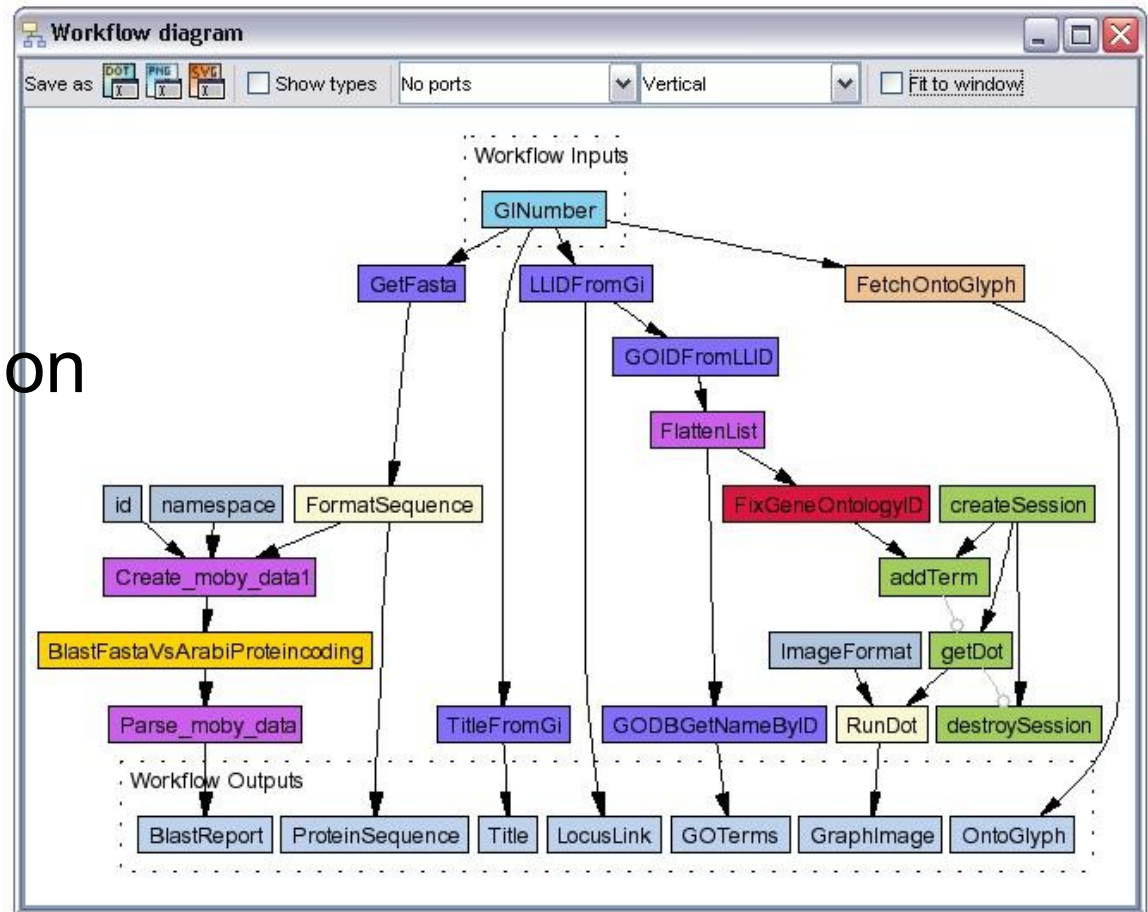
<http://www2.astrogrid.org/desktop/astro-runtime>  
<http://www.astrogrid.org>

# Client-side Science Scripting

- Command-line access to VO
  - through Python scripts (or perl, or other language) calling AstroRuntime routines.
  - astronomer can integrate VO services with their existing toolset.
- Power of the for loop.
  - remote app. execution
    - sextractor script, montage mosaic tool
  - image search at multiple positions
  - cone search over multiple archives

# Client-side Workflow

- Taverna workflow engine
  - Graphical interface
  - Step-through execution
- Connects to Astro Runtime to call VO services.





# Demo and Links

<http://www.astrogrid.org>

<http://www2.astrogrid.org/desktop/astro-runtime>

<http://taverna.sourceforge.net>

<http://www.myexperiment.org/>