IVOA WebServices

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What exactly is a WS ?

FROM http://dev.w3.org/cvsweb/~checkout~/2002/ws/arch/wsa/wd-wsa-arch.html#whatisws

[Definition: A Web service is a software system identified by a URI, whose public interfaces and bindings are defined and described using XML. Its definition can be discovered by other software systems. These systems may then interact with the Web service in a manner prescribed by its definition, using XML based messages conveyed by internet protocols.]

Note:

Our definition of the term "Web services" does not presuppose the use of **SOAP** as a packaging format or a processing model. Nor does it presuppose the use of **WSDL** as a service description language. There are, and will be in the future, plenty of Web services that use raw HTTP as a data transfer protocol and some mutually agreed-upon XML format as the message content. The Web Services *reference architecture* does, however, assume that the higher levels of the Web services protocol stack are built on the foundation of SOAP and WSDL.

Cone and SIAP

- CONE
  - returns all objects within SR or given RA and DEC as XML
  - has SIZE=0 – returns some metadata as XML
- SIAP
  - returns refs and descriptions of images at POS(RA,DEC) of SIZE(H,W)
  - has FORMAT=Metadata – returns some metadata

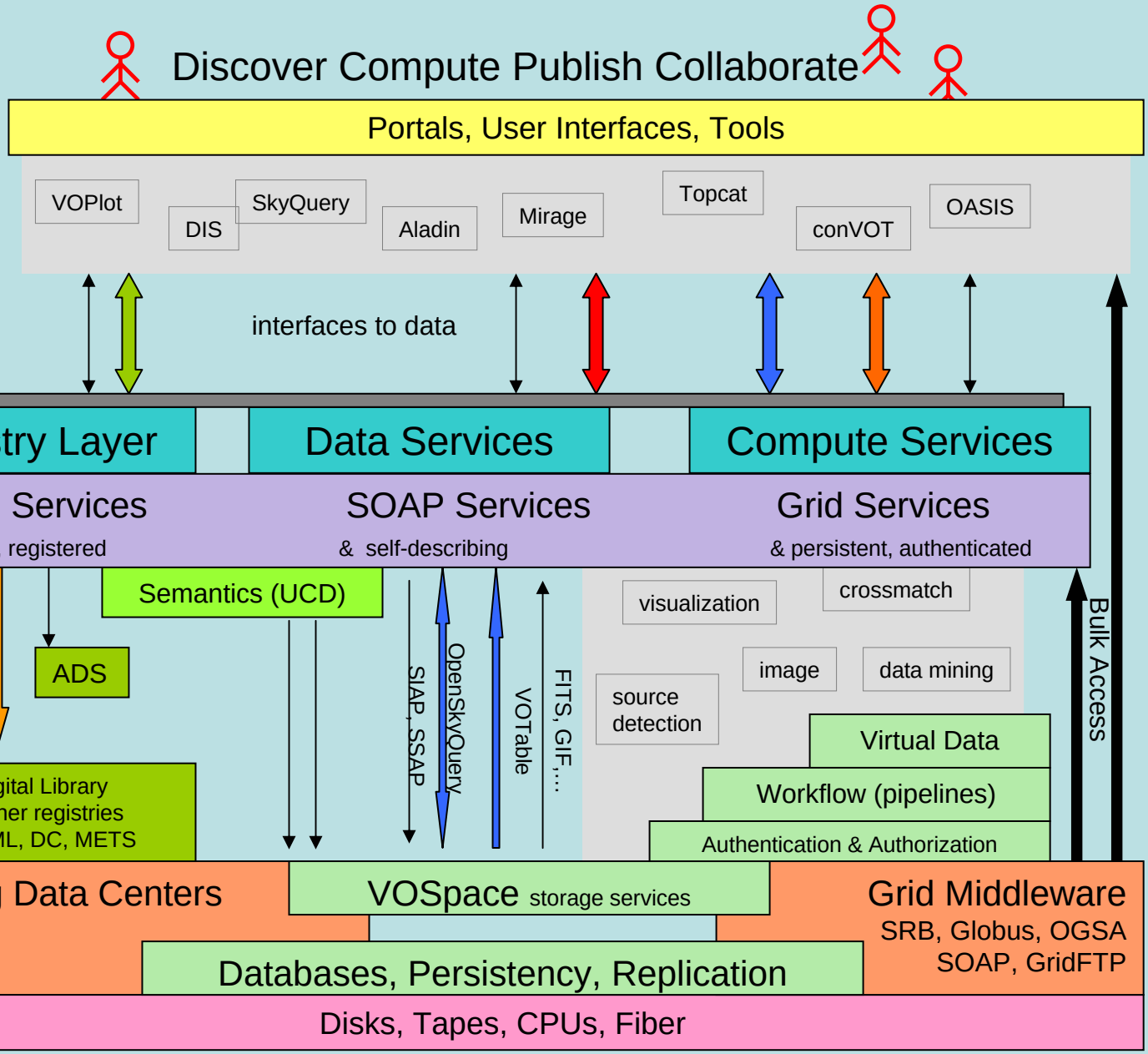
But not properly described in a manner which may be used automatically

So technically **NOT WebServices**

WS/SOAP in IVOA and NVO

- NVO (and IVOA) find WS a good stepping stone to the GRID without the complexity of GLOBUS etc.
- SOAP/WS was not mature enough when CONE/SIAP defined (>2years ago)
- General feeling this may be good – but still no agreement to use WS/SOAP extensively e.g. Simple Spectral Access (SSAP) is now being defined in similar manner to SIAP.
- NVO and AstroGrid very much in favour of WS.
  - Platform independent
  - Tools – language indepentant
- WebGrid Services group (G. Rixon IVOA, R. Williams NVO)– starting to define standards

Virtual Observatory Architecture



VO Support Interfaces

Working Draft

http://www.ivoa.net/internal/IVOA/VOSupportInterfaces-0.2.pdf

getAvailability- Mandetory

- Is service alive?
  - Needs to be more than a ping service should check databases etc.
- UpTime
- ValidTo – planned downtime

GetRegistration

- Method to return VOResource
- Make service the owner of the MetaData
- Could be used by registry:
  - Register only the base url
  - Registry calls MetaData creates the entry
  - Registry may then refresh periodically

Logging

- Will be a large issue – all VO's will need to report usage
- Good to be able to ask service about usage patterns
- Implies Logging is done
- What is the minimum useful info we need?
- Does it need to be secured
  - Partially secured?

Single Sign On

Proposal

http://www.ivoa.net/twiki/bin/view/IVOA/IvoaGridAndWebServices/IVOA.SingleSignOnProposal

SingleSignOn – Goal

- Identification for Access control e.g:
  - any part where a user stores data or changes the system state;
  - a minority of archive services where access to the data is restricted;
  - services that limit use of resources (storage, CPU time, etc.).
- Allowing
  - a user to have one password for the entire VO.
  - a user to sign in once per session on the VO, not once per use of a service;
  - services to 'sub-contract' work to other services in a user's name.
- Authorization to be done by service provider

SSO – WSSecurity

WSSecurity now seems ok

Wish to utilize the libraries for SSO in VO

So we have:

- WSS:Security element in SOAP Header
  - WSU:Timestamp (signed)–> Uniqueness
  - Multiple Identity warrants – X509v3
- DS:Signature in SOAP body

SSO- Certificate Authorities

Must deal with different warrants:

- Long Lived e.g. one year , CA sees ID like passport
- Short Lived e.g. one day issued perhaps by a community : CA part of runtime

  Suggested for VO
- Referee e.g. CA endpoint passed in message – service requests warrant from CA

Need to experiment – requires trust between CAs

Asynchronous Activity
Proposal

http://www.ivoa.net/twiki/bin/view/IVOA/IvoaGridAndWebServices/IVOA.AsynchronousActivityProposal

Asynchronous Activity

- a major archive query traversing a large DB table;
- a data-mining job run from a batch queue;
- a workflow with many steps;
- a workflow repeated for many data sets.

Related :

- CASJobs
- GAF recently
- Open Sky Query

Asynch – What we need.

- context: a way of associating a web-service operation with an activity;
- a way of getting information about the state of a context;
- management of the lifecycle of contexts such that resources are not leaked;
- notification by services of changes in contexts, e.g. "job complete".

VOSpace – not yet a proposal

Allow interaction of

- MyDB
- MySpace
- SRB

- Common WSDL in front of all – not all functionality
- Common namespace for all systems

Functioning Web Services

Yes its not all paper work !

WebServices at CDS

http://cdsweb.u-strasbg.fr/cdsws.gml

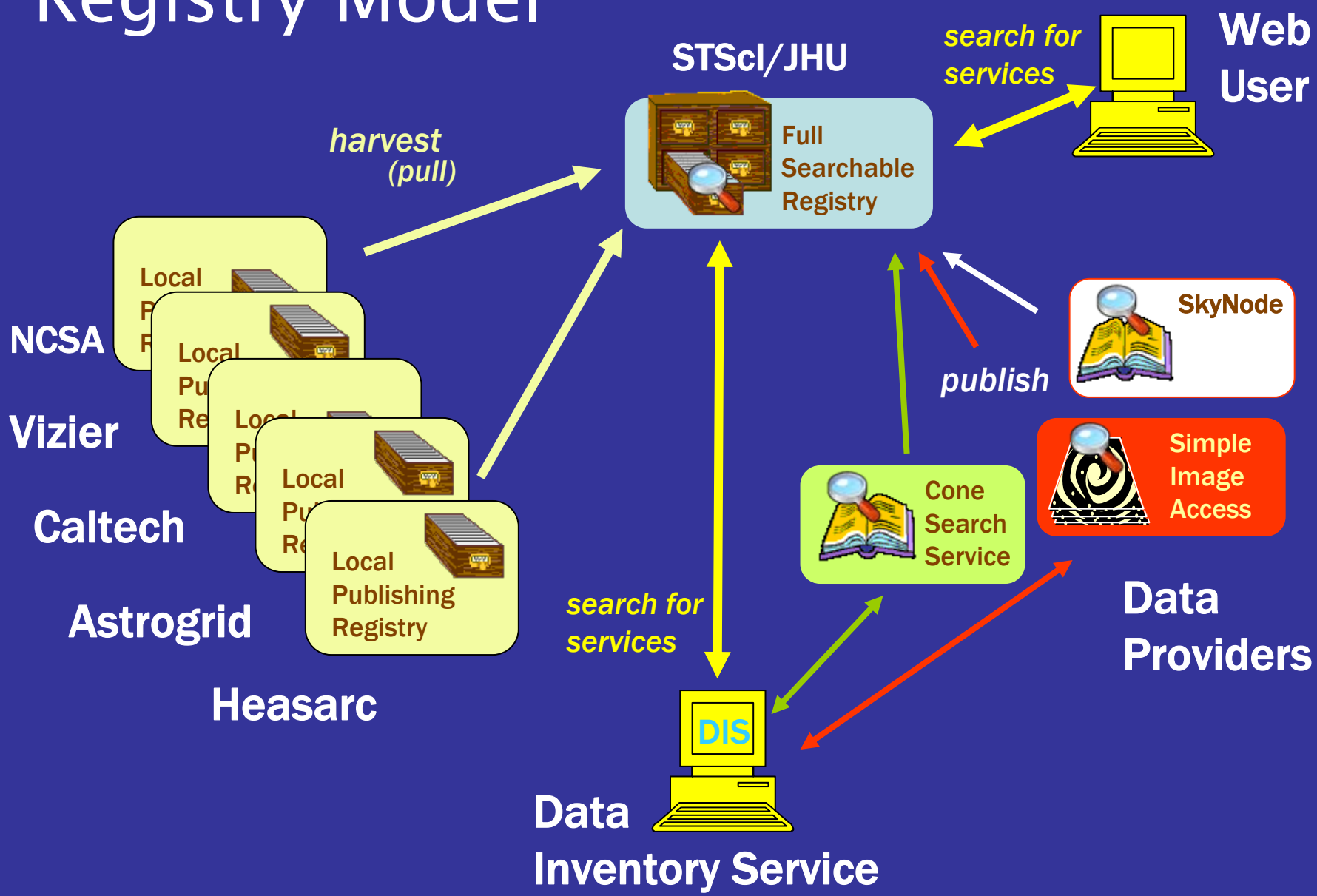
- Coordinate Conversions
- Aladain Image
- Name resolver (NED/SIMBAD/VIZIER)
- UCD – Unified Content Descriptor
- Vizier Catalogue Metadata

NVO Searchable Registry

http://Nvo.stsci.edu/VORegistry

- Publication site for astronomical *resources*:
  - Individual or Groups of Services, collections, data, etc.
- Harvests (collects) resources from other registries
- Search Interfaces: simple and complex (as WS)
  - mixes WS with tradiitonal services
- Implements VO standards
  - IVOA Resource XML schema: astronomical metadata
    - Dublin core
    - standard VO Service descriptions and access points
  - OAI (Open Archive Initiatives)
    - VO interdisciplinary science gateway
- Standard is working draft

Registry Model



Galaxy Morphology

http://sdssdbs1.stsci.edu/nvo/GalaxyMorph/galmorph.aspx

- Uses multiple components
- WebService used to hide complete grid computing process
- This is a good approach for VO (like Denis showed earlier)

- How it works

  http://nvo.ncsa.uiuc.edu/cgi-bin/SlideShow.cgi

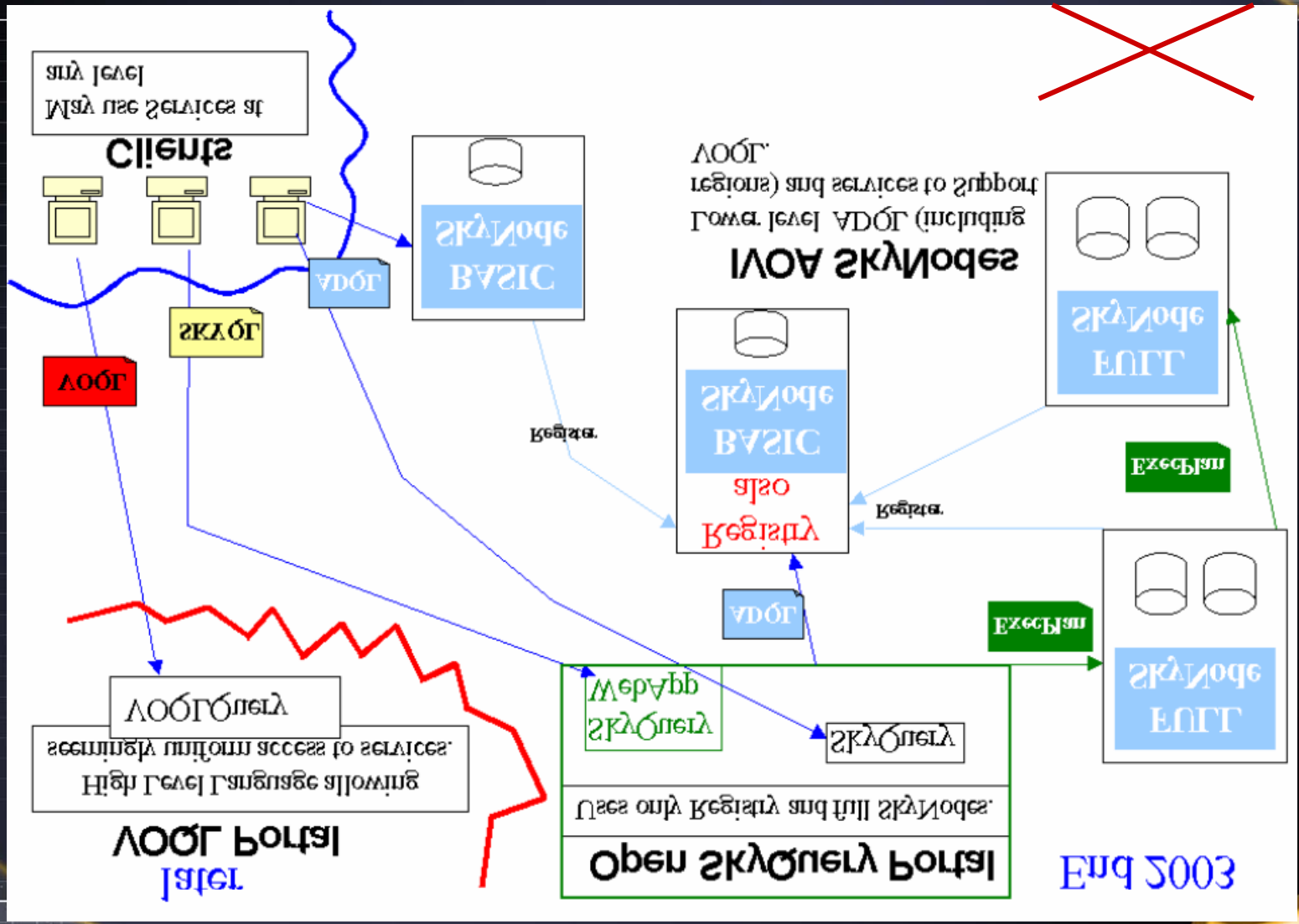
Open Sky Query

http://openskyquery.net

- Demonstrates ADQL0.7.4 (Working draft)
- Demonstrates SkyNode0.7.4 (working Draft)
- Creates workflow to cross match multiple distributed catalogs
- Open Standards based
  - SOAP/WSDL
  - VOTable1.1

OpenSkyQuery –Architecture

March 2004



Issues

- Single Sign On
  - Security
  - Certificates
- Asynch activity