An intelligent client application for on-line astronomical information

Chenzhou CUI
Chinese Virtual Observatory Project
National Astronomical Observatory of China
VO concept

- Virtual Observatory (VO) is a data-intensive online astronomical research and education environment, taking advantages of advanced information technologies to achieve seamless, global access to astronomical information.
- The power of the World Wide Web is its transparency. It is as if all the documents in the world are inside your PC. The idea of the Virtual Observatory is to achieve the same transparency for astronomical data and other related information (Quinn et al. 2004).
The World Wide Telescope
an Archetype for Online-Science

Jim Gray (Microsoft)

Alex Szalay (Johns Hopkins University)

Microsoft Academic Days in Silicon Valley

http://research.microsoft.com/~gray/talks
VO, the best testbed for GRID

The Grid 2
Blueprint for a New Computing Infrastructure
Second Edition

Preface to the Second Edition
Part I: Perspectives
...
Part II: Framework
...
Part III: Applications
Chapter 5 Predictive Maintenance: Distributed Aircraft Engine Diagnostics
Chapter 6 Distributed Telepresence: The NEESgrid Earthquake Engineering Collaboratory
Chapter 7 Scientific Data Federation: The World Wide Telescope
Chapter 8 Medical Data Federation: The Biomedical Informatics Research Network
...
Chapter 14 Service Virtualization: Infrastructure and Applications
Chapter 16 Collaborative Science: Astrophysics Requirements and Experiences
Part IV: Architecture
IVOA in Growth

- International Virtual Observatory Alliance (IVOA)
  - formed in June 2002
  - with a mission to facilitate the international coordination and collaboration necessary for the development and deployment of the tools, systems and organizational structures necessary to enable the international utilization of astronomical archives as an integrated and interoperating virtual observatory.
IVO, Global Astronomy GRID
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Online Astronomical Resources

- Catalogs (Database tables)
- Image archives
  - Spectrum archives
- Bibliographic archives
- Information services
Catalog Databases

- CDS VizieR catalog service (~5000)
- SDSS DAS (Jim Gray’s skyserver, 3TB)
- ...
Image Archives

- NASA Image Archive Center
  - (CXC, HEASARC, IRSA, LAMBDA, MAST, NED, NSSDC, PDS, SPITZER)
  - HST
  - Mars orbiters
  - JPL missions
- Sloan digital sky survey (sdss)
- CDS Image Server and Portal Aladin
- ESO Archives
- ...
Bibliographic services

- Abstract Service @ NASA Astrophysics Data System
- CDS Bibliographic services
- Almost Free for all

Smithsonian/NASA Astrophysics Data System (ADS)

Query Results from the Astronomy Database

Retrieved 100 abstracts, starting with number 1. Total number selected: 26345.

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Information services

- SIMBAD Name resolver @CDS
- NED Name resolver
- AstroGLU @CDS
- Astronomical Dictionaries
- IVO Registry
XML Web Services are essentially library modules or API that live on the Web. You can access the published methods by making so called SOAP requests. Because of the underlying technology (XML, SOAP, WSDL, etc.) Web Services are inherently interoperable. In other words, you can use them regardless of what your favourite platform and operating system are. Freely downloadable toolkits, such as Microsoft’s .Net Framework and Apache’s Axis for Java, make the integration of Web Services seamless with your code. Many of the services listed here come with short descriptions on how to get started. For more details, please check out the help page!

Below is a rapidly growing suite of services developed for the Virtual Observatory.
Welcome to the CDS XML Web Services portal

Important: on these pages the expression "XML Web Service" means a web service accessible through the SOAP protocol.

CDS XML Web Services are based on Tomcat5 and Axis 1.2.1 technologies.

Questions or comments can be sent to question@simbad.u-strasbg.fr for questions related to CDS XML Web Services.

You participate to IVOA and you (want to) use CDS XML Web Services:
  - you can register to get the last informations and warnings
  - if you need a new XML Web Service, send us a mail with a short description

Please, read the using conditions before any use of the available XML Web Services.

Tomcat and Axis are copyright Apache foundation.
SkyMouse

• An information service developing in China-VO team
• Touch the sky with a simple mouse over
• Access to world wide astronomical references, catalogs, images, and maybe more, by a simple “MouseOver” action.
China–VO: SkyMouse

- Open Standard Interface (WS)
- VO Registry
- AJAX and Web 2.0

**User Interface**

- Word Pickup Engine
- Semantic Analyzer

**Global Gatekeeper**

- ADS Biblio
- VizieR Catalog
- Aladin Image
- NED
- VO Image Service
- VO Catalog Service
- CDS SIMBAD Name Resolver
- Astro-Dictionary
- Astronomy Otology
- IVO Registry
Characteristics

• Easy of Use
  - Copy->Open Web Browser->Visit Astronomical Database website->Select service->Paste->Custom Options->Submit
  - Mouse Over (optional simple configuration)

• Smart
  - Default configuration for different users
  - Semantic analyze (i.e. word or phase)
  - Self-learning
    • from the user’s behavior and habit
  - IVO Registry support (semantic web, GRID)
Demonstration

http://fkz.lamost.org/skymouse
Roadmap

- 2005–09–30  SkyMouse Tech Preview alpha;
- 2005–11–15  SkyMouse Tech Preview beta;
- 2005–12–31  SkyMouse 1.0 Alpha
- 2006–06–30  SkyMouse 1.0 Beta
- 2006–12–31  SkyMouse 2.0 Alpha
- 2007–04–30  SkyMouse 2.0 Beta
SkyMouse

- A new user interface for Astronomical online services
- An intelligent VO client
- A commodity for astronomers and students