

## A Planetary Science VO prototype

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### Abstract

The goal of the JRA4 Work Package of Europlanet-RI was to set the basis for a European Virtual Observatory in Planetary Science. The objective in this first step was to save time during searches in big archives and small databases, as well as to facilitate data access and visualization. The system is based on a new access protocol based on TAP, a specific client to query the available services, and intensive recycling of tools developed for the Astronomy VO. Some new databases were also produced in the EuroPlaNet-RI framework and are available in this context. This system should be extensible to all fields of Planetary Science, and open to external data providers.

### 1. Introduction

In the framework of the Europlanet-RI program, the JRA4 WP has contributed to setup a prototype Virtual Observatory dedicated to Planetary Science. Most of the activity was dedicated to the definition of standards to handle data in this field. The aim was to facilitate searches in big archives and sparse databases, to make on-line data access and visualization possible, and to allow small data providers to make their data available in an interoperable environment with minimum effort. This system makes intensive use of studies and developments led in Astronomy (IVOA), Solar and Plasma Physics (HELIO, SPASE), and space-borne archive services (IPDA). In particular, it remains consistent with extensions of the IVOA standards.

### 2. Data scope

The perimeter of data to be accessed by the Europlanet VO derives from the objectives stated in the program proposal. It includes databases produced by the various work packages during the program (including JRA4/task4); a selection of space borne data from planetary missions (PSA); data of interest selected by SA-IDIS participants, etc...

These data are extremely heterogeneous. Some are organized in data services with specific access mechanisms (e.g. PSA for space missions, AMDA for plasma data, SSODnet for small bodies properties, GhoSST for laboratory spectroscopy...), some are available as small data bases or even simple tables on the web.

The available data services are listed in a catalogue with architecture consistent with IVOA's registries. This catalogue includes a short description of the data services, as well as a mention of the access mechanisms they support.

### 3. Architecture

The architecture foreseen is to connect existing data services with IVOA protocols (Cone Search, TAP...) or with the IPDA protocol (PDAP) whenever relevant (Fig. 1). However, a more general standard has been devised to handle the specific complexity of Planetary Science, e.g. in terms of measurement types and coordinate frames. This protocol, named EPN-TAP, is based on TAP and includes precise requirements

to describe the contents of a data service. A light framework (DaCHS/GAVO) and a procedure have been identified to install small data services, and two hands-on sessions have been organized already. The data services are declared in the extended IVOA registry based at VO-Paris.

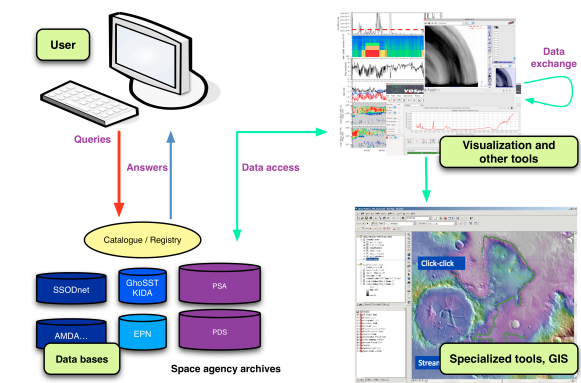


Figure 1: Overall scheme for the Europlanet VO

Although TAP services can be accessed and queried from tools such as TopCat, a full client is being developed at VO-Paris. It is able to use all the mandatory parameters in EPN-TAP, plus extra parameters from individual services. The results can be sent to VO visualization tools such as TopCat, SpecView, or Aladin though the SAMP protocol. Open source GIS tools can also be used to mosaic images. A special handling mode is being developed to access PDS3 data files on-line. A resolver for target names and an ephemeris service are also available (Fig. 2).

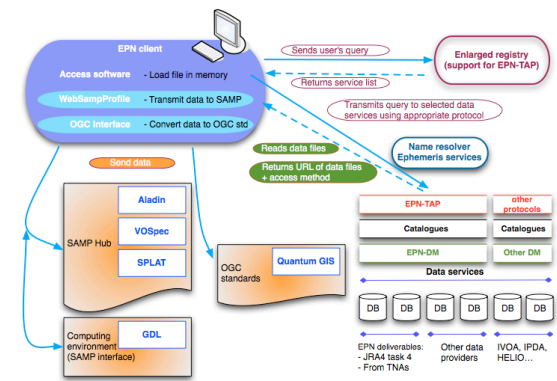


Figure 2: Data access and visualization services

## 4. Prospects

The next step will be to publish new data services and to encourage external teams to share their data through EPN-TAP, with a focus on current planetary mission support (Rosetta, Cassini, Mars-Express, Venus-Express...).

More information is available on the VO-Paris EPN node: <http://voparis-europlanet.obspm.fr/> including documentation and demonstrators.

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