International

Virtual

Observatory

Alliance

Enabling a robust VOSpace for VO tools and services

Version 1.0

IVOA Note 2008 October 25

This version:
1.0-20081025
Latest version:
http://www.ivoa.net/Documents/latest/latest-version-name
Previous version(s):

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Abstract

VOSpace [3] is the IVOA [9] work for the definition of an interface to a virtual file system available for VO applications and services. It defines only the interface and not the storage infrastructure. This one is under the responsibility of the “space provider”. In this note we explain our work about the implementation of a VOSpace [3] and the use of iRODS [5]. This work is done in the frame of the VOTECH [4] project.

Status of This Document

This is a Note. The first release of this document was 2008 May 14.
In this version we make a report after 2 prototype installations and before the production release (end of 2008).

Choose one of the following (and remove others plus yellow lines):

Note

This is an IVOA Note expressing suggestions from and opinions of the authors. It is intended to share best practices, possible approaches, or other perspectives on interoperability with the Virtual Observatory. It should not be referenced or otherwise interpreted as a standard specification.

A list of current IVOA Recommendations and other technical documents can be found at http://www.ivoa.net/Documents/.

Acknowledgements

This document derives from the work done at CDS in the frame of the Design Study 3 of the VOTECH [4] project. Many thanks to Jean-Yves Nief from IN2P3 in Lyon for the useful discussions and support about iRODS [5] and for his presentation of iRODS in Strasbourg. Many thanks also to Reagan Moore and his team for the encouragements and the publishing of an abstract of our work on the iRODS Wiki [13].

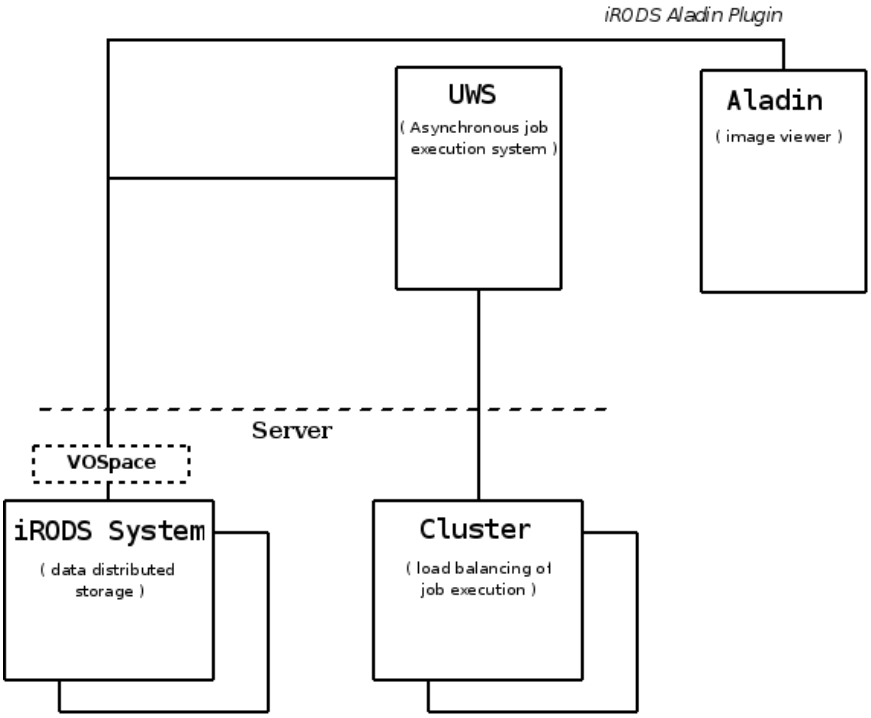
Contents

1 Introduction

VOSpace [3] is the IVOA interface to distribute storage. It is the visible side of the storage system. To make VOSpace [3] usable in the real life we need an efficient storage mechanism. SRB [10] (Storage Resource Broker) is a tool enabling the distribution and the access to data available at different locations and on mixed media (files on disk, databases and tapes). It has been developed by the SDSC Storage Resource Broker team and collaborators. iRODS [5] (integrated Rule-based Data System) is a new data grid software system being developed by the same team and which will replace SRB [10].

2 Use case

Our first aim was to create a storage area for Aladin [6] but also for the new CDS Portal which is under development. In a first step we have developed an Aladin [6] plugin giving an access to the iRODS [5] implementation and in a second step the VOSpace [3] interface has been added over iRODS [5] (see the following figure).



3 iRODS

The version 1.0 has been released in January 2008 and the Jargon [11] Java API enables an easy use of it. Our prototypes have been developed with this version but the production release will be based on iRODS 1.1

3.1 Hardware side

In a first step, we have deployed iRODS [5] on 2 machines and a simple rule has been added to enable the automatic replication of the data. After a first evaluation we have made the work again with a new set of servers. A 12TB (2 quad core servers with 8 GB memory and 6 TB of disk each) configuration is under installation. It will be the first production release and we will adapt this configuration after a first 6 month period. The real needs are not easy to evaluate and the probing period will help us to define long term VOSpace-iRODS architecture.

3.2 Learning iRODS

As a first experiment we have developed a plugin for Aladin [6] with just put and get capabilities to interact with the iRODS [5] implementation.

4 VOSpace over iRODs

The last prototype is based on the 1.1 RC1 of VOSpace [3]. It has been deployed as a Web Service in Tomcat with AXIS 2 following the VOSpace [3] WSDL (this version of Axis can be configured to be REST [12] compliant). The production release will be based on the VOSpace 1.1 RC3 version.

4.1 Implementation of the interface

File creation/removing/moving have been developed via Jargon. Concerning the file copying to VOSpace [3] (PushToVOSpace, PullFromVOspace), it has been done with a servlet. The entire interface is implemented excepted “find” which cannot be used to retrieve a list of files.

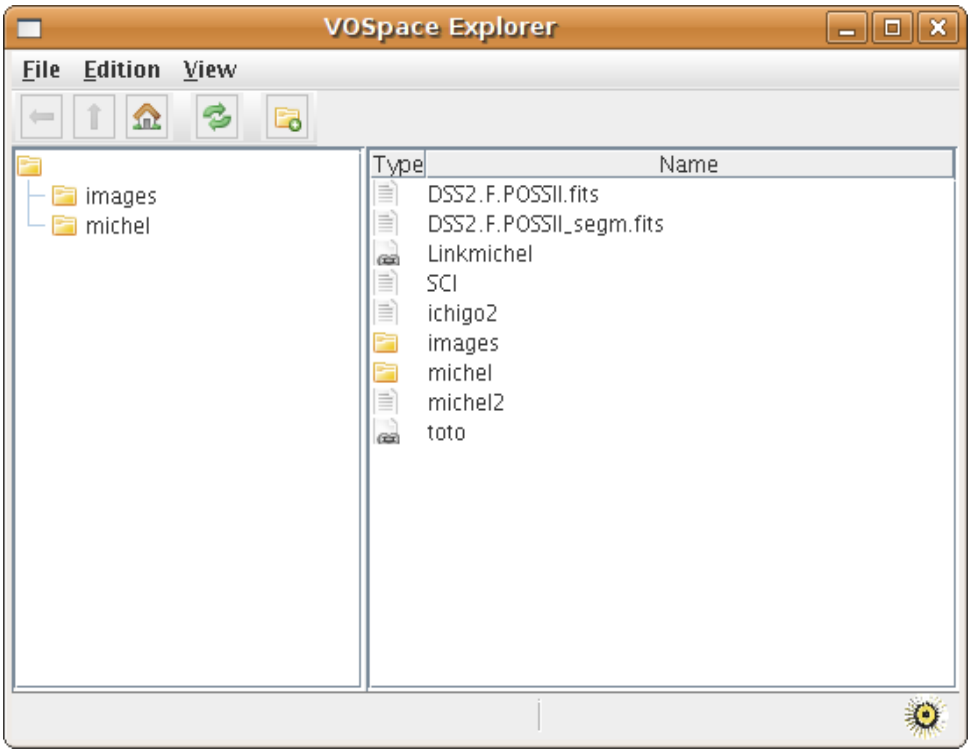
4.2 Interaction with VOSpace

4.2.1 A small API

We have created a Java API from the VOSpace [3] WSDL to interact with the SOAP Web Service.

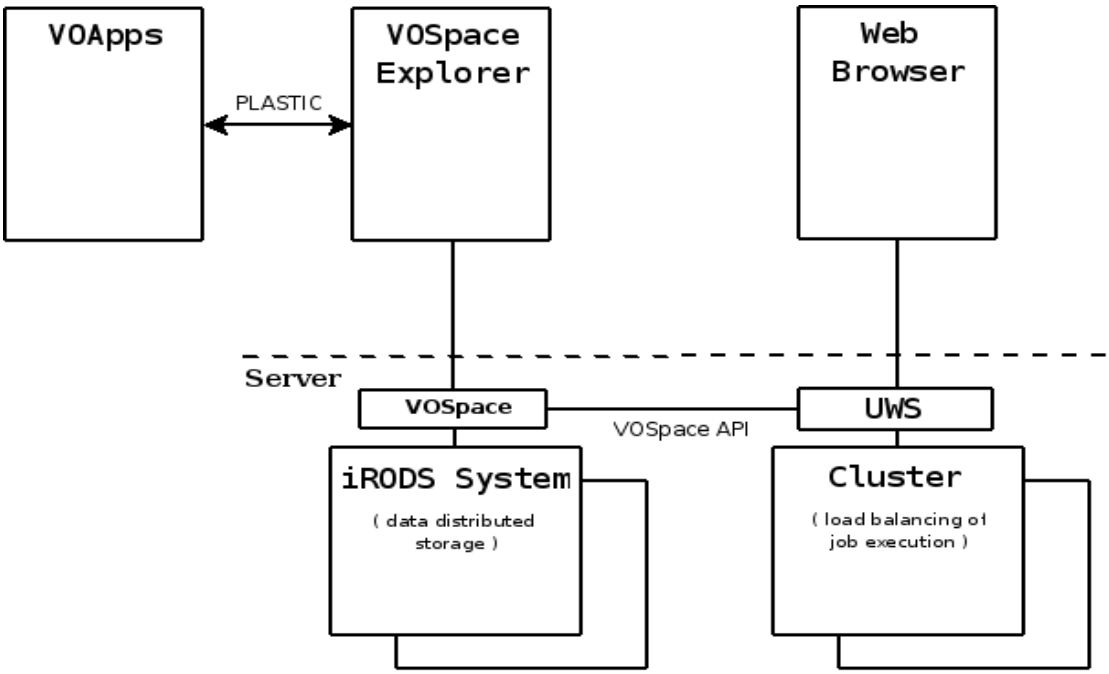
4.2.2 VOSpace Explorer

We have developed a VOSpace Explorer in Java to access and manage the files. It is possible to do the common actions on the files. If a VO Tool supports drag and drop it is possible to interact through this way with the explorer.

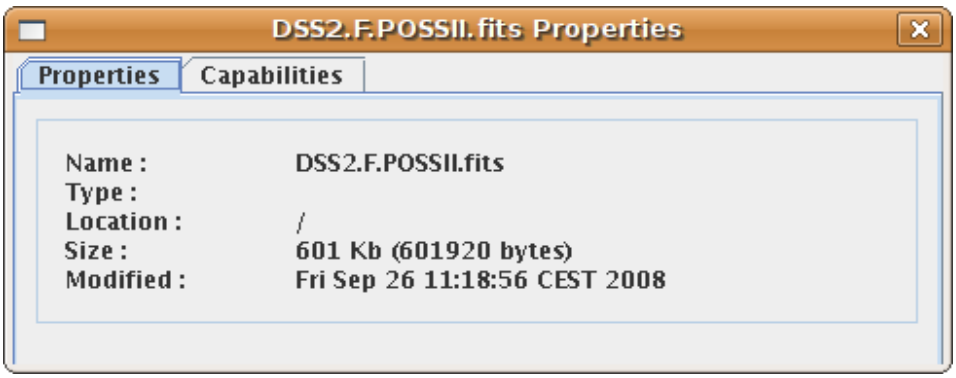


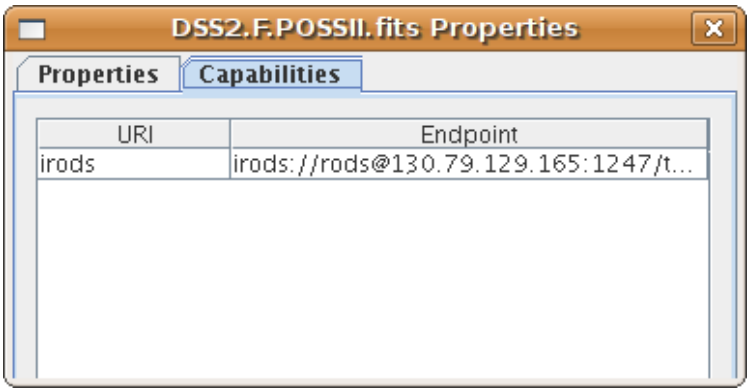
VOSpace Explorer integrates PLASTIC [8] and makes the interaction possible with other tools like Aladin [6] or TOPCAT [7].

The last architecture:



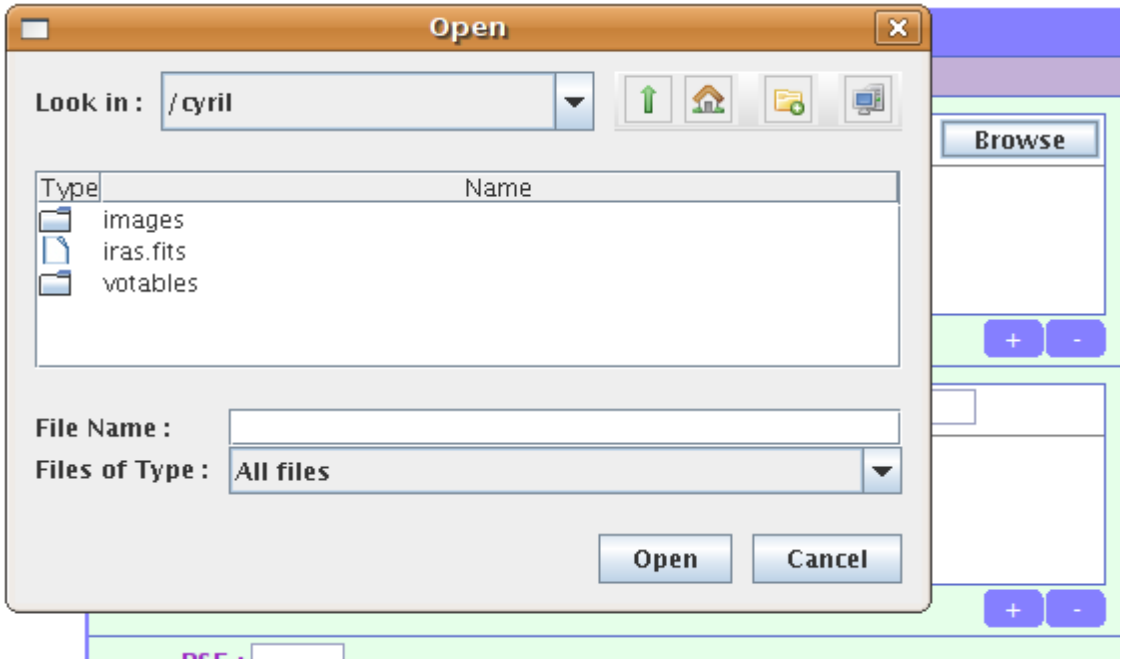
Properties of a file, iRODS as capabilitiy.



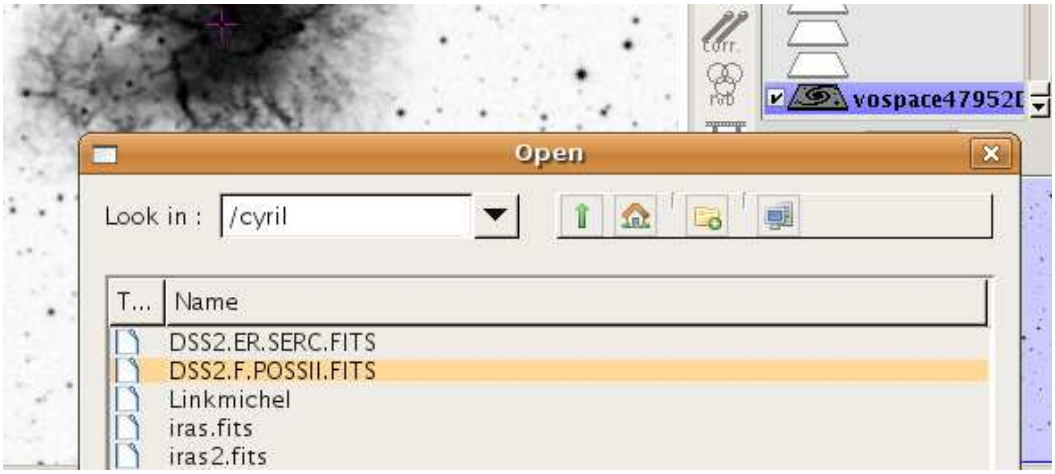


4.2.3 A VOSpace FileChooser

Example of the VOSpace FileChooser implemented as an Applet.



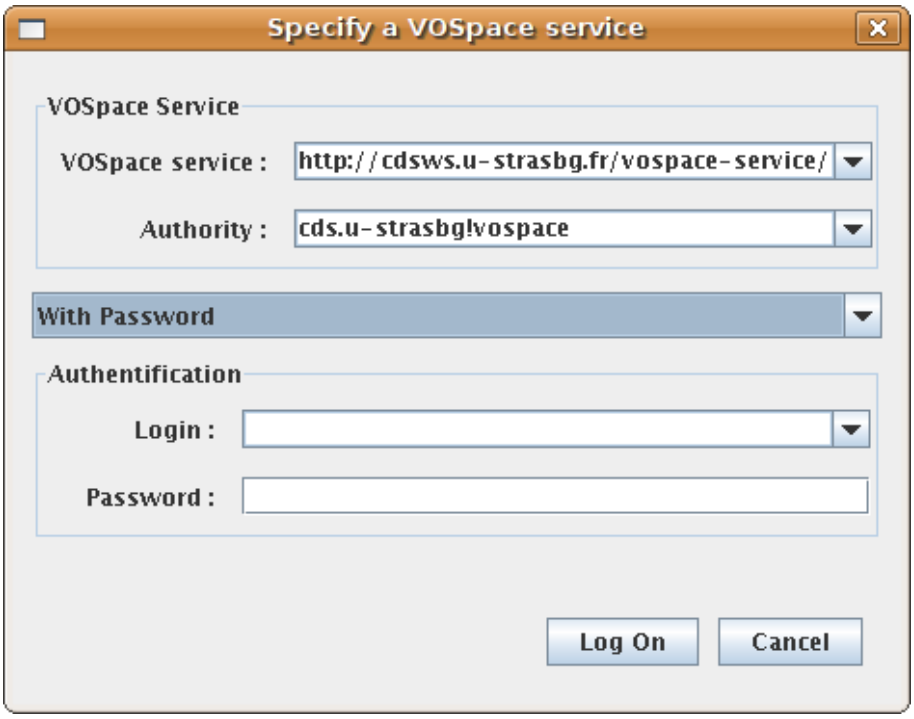
Other example with a use as an Aladin plugin.



5 Security policy

Choice of the authentication mechanism between:

- no authentication
- TLS with password (available) or TLS with certificate (available soon)



5 Visibility

The IN2P3 organizes an iRODS one week multi-disciplinary workshop in February 2009 in Lyon and we will make a presentation about the use of iRODS in the Virtual Observatory.

6 Conclusion

iRODS [5] is easy to implement and provides a good solution to ensure the robustness of a VOSpace [3]. The installation is simple and can be done without much manpower. It is possible to start with a small configuration and to follow the evolution of the needs.
A PLASTIC [8] compliant tool like VOSpace Explorer is useful to provide a simple access to the stored files for VO Applications.

As the main conclusion of this work we think that iRODS is a very good solution for the implementation of a robust VOSpace. And for many reasons (Open

source, easy to use, flexible (definition of micro-services), follows the evolution of the architecture, etc.).

Appendix A: “Appendix Title”

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References

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[13] VOSpace-iRODS abstract on iRODS Wiki, http://www.irods.org/index.php/VOSpace