



Wide Field Astronomy Unit (WFAU)

Virtual Observatory Data Access service

Virtual Observatory Data Access service



Target use cases :

- JOIN queries combining data from the catalogs at ROE
- JOIN queries combining data from the catalogs at ROE with data from external TAP services
- Space for storing user data, including query results and uploaded data

Virtual Observatory Data Access service



Implemented using

- ADQL parser from CDS



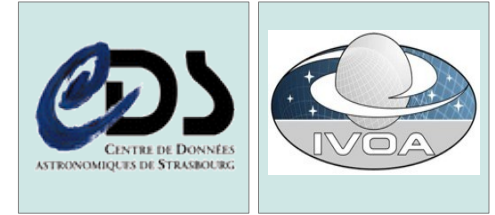
- SQL Server cluster at ROE



- OGSA-DAI DQP service from EPCC



Virtual Observatory Data Access service



ADQL library from CDS

- ADQL syntax checking
- Data structure validation
- SQL dialect translation

ADQL Library v1.1

This CDS library lets parsing, manipulating and translating ADQL queries.

Getting started !

Download

What is ADQL ?

ADQL is a SQL-like language which includes astronomical facilities to query a database. This language has been defined by the IVOA in the [Recommendation of 30 Oct 2008 \(Version 2.0\)](#) and is mainly used in the Table Access Protocol (TAP).

Why this library ?

In order to help Java developers to parse, manipulate and translate ADQL queries quickly and with as few lines of code as possible.

Functionalities:

- Parse: read ADQL queries in text and transform them into a Java object (actually, a syntactic tree).
- Manipulate: the generated object can be manipulated so than modifying the original query.
- Translate: an interface and some implementations lets translating SQL into other languages like SQL.

Demo

How to use it ?

- [Getting started](#): to start with this library.
- [Documentation](#): to have more details about all provided functionalities.
- [Javadoc](#): Java documentation of all available classes.
- **NEW!** [What's new ?](#): Last modifications of the library.

If you have any question about the ADQL library, you can [send it to the CDS](#).

This library is free: you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License.

Author: Grégory Mantelet ([CDS](#))
Last modification: 15-06-2012



Extensible architecture makes it easy to add customizations.

Validates and translates the the query components (tables, columns and fields) with the abstract structure in our metadata service.

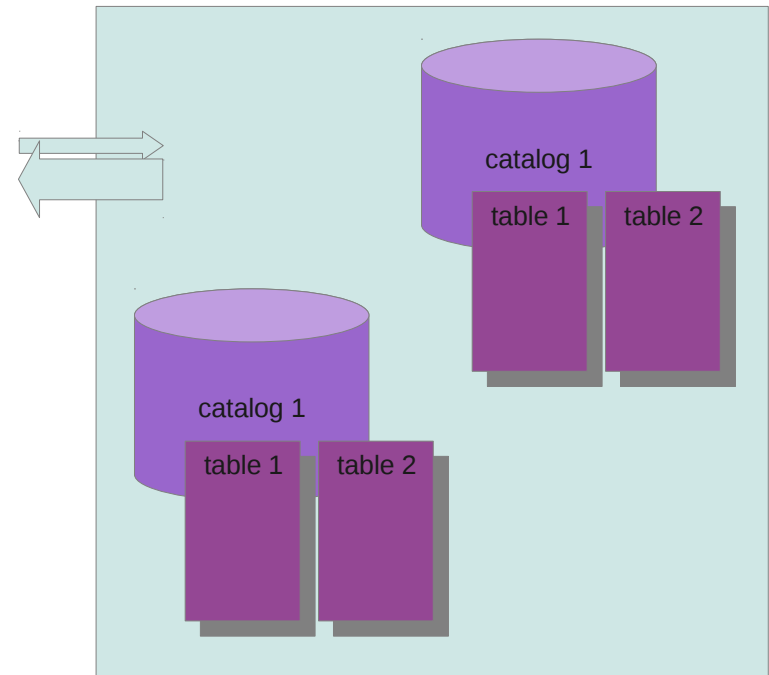
Virtual Observatory Data Access service



SQL Server cluster at ROE

- Supports cross catalog queries within the system
- All of the data is accessible from a single namespace

```
SELECT
    catalog1.dbo.table1.column1,
    catalog2.dbo.table2.column2,
FROM
    catalog1.dbo.table1
JOIN
    catalog2.dbo.table2
ON
    ....
WHERE
    ....
```

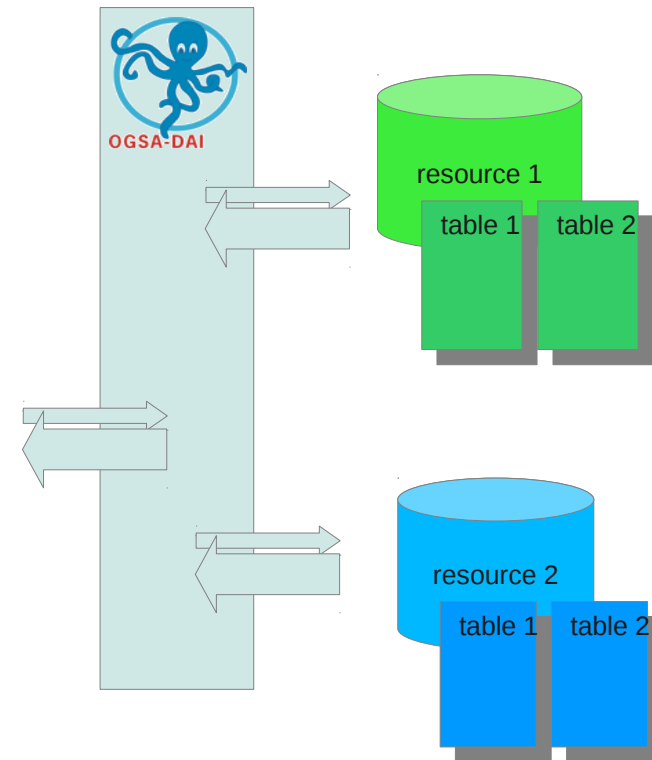


Virtual Observatory Data Access service



OGSA-DAI service from EPCC

- Middleware services enabling federation of heterogeneous data resources.
- Used in a wide range of applications including medical research, geographical information systems, meteorology, transport, computer-aided design, engineering and astronomy.



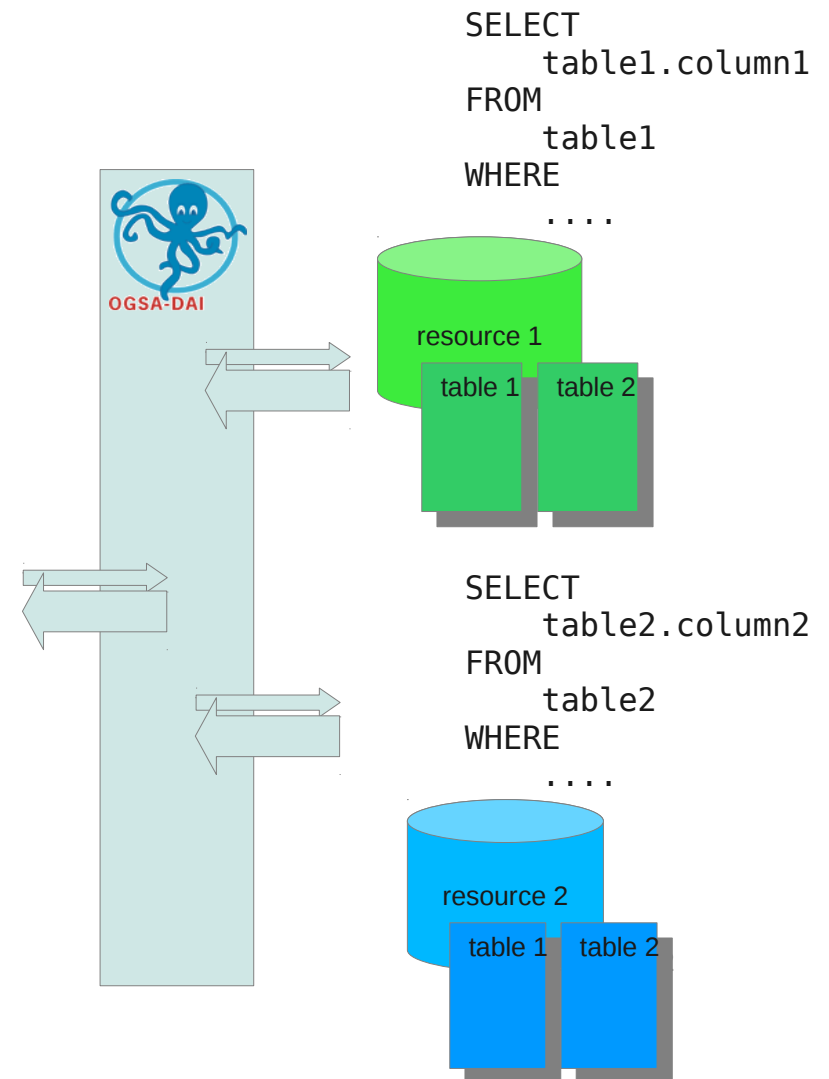
Virtual Observatory Data Access service



Distributed Query Processor (DQP)

- Splits a JOIN query into separate sub-queries for each resource
- Combines the results from each sub-query to recreate the original JOIN

```
SELECT
    resource1.table1.column1,
    resource2.table2.column2,
FROM
    resource1.table1
JOIN
    resource2.table2
    . . . .
```

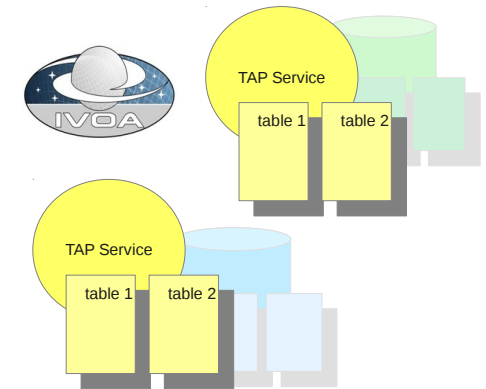


Virtual Observatory Data Access service



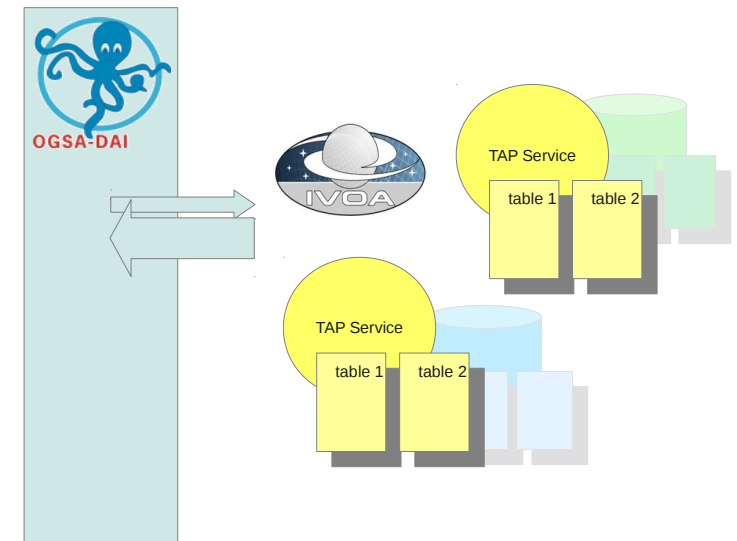
IVOA TAP services

- Provides a common abstraction for databases
- Hides the implementation details
- Services from different data providers behave the same way



OGSA-DAI astronomy extensions

- Developed for ROE by EPCC
- Enabling OGSA-DAI to use IVOA data services



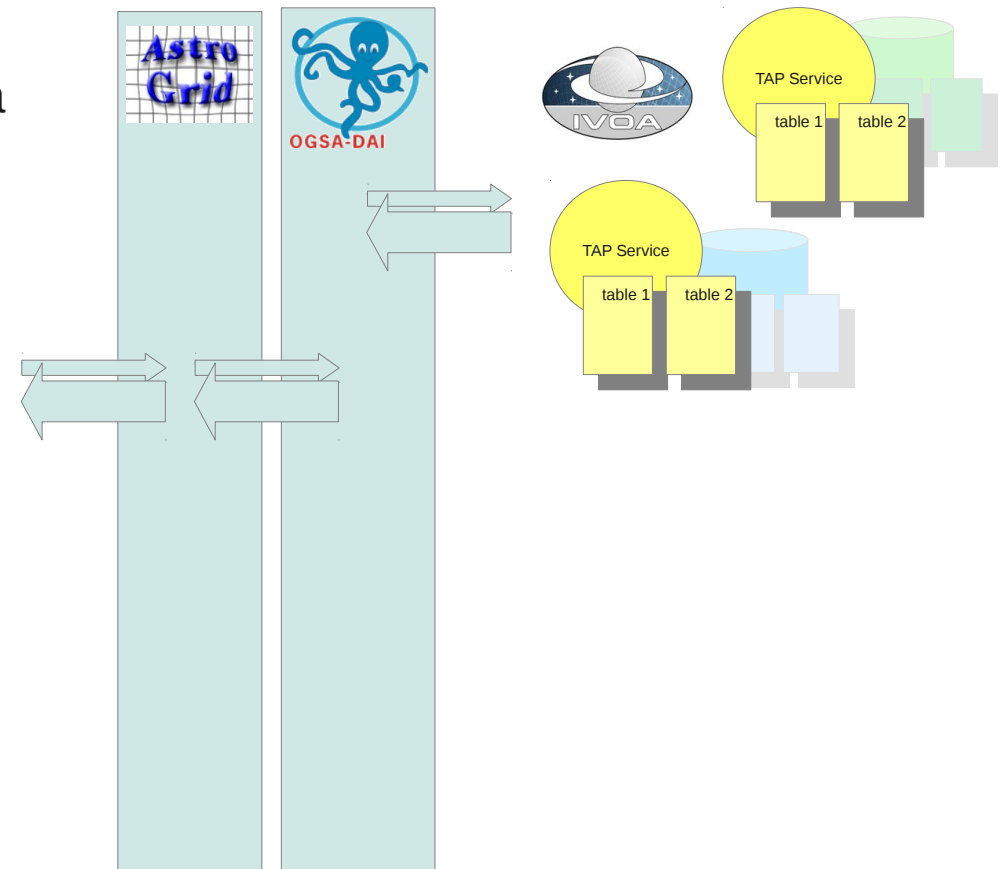
Virtual Observatory Data Access service



OGSA-DAI TAP Factory

- Prototype federated TAP service
- Developed for ROE by EPCC
- Using OGSA-DAI DQP to combine data from external TAP services
- Using AstroGrid DSA to provide TAP interface

```
SELECT
    service1.table1.column1,
    service2.table2.column2,
FROM
    service1.table1
JOIN
    service2.table2
```



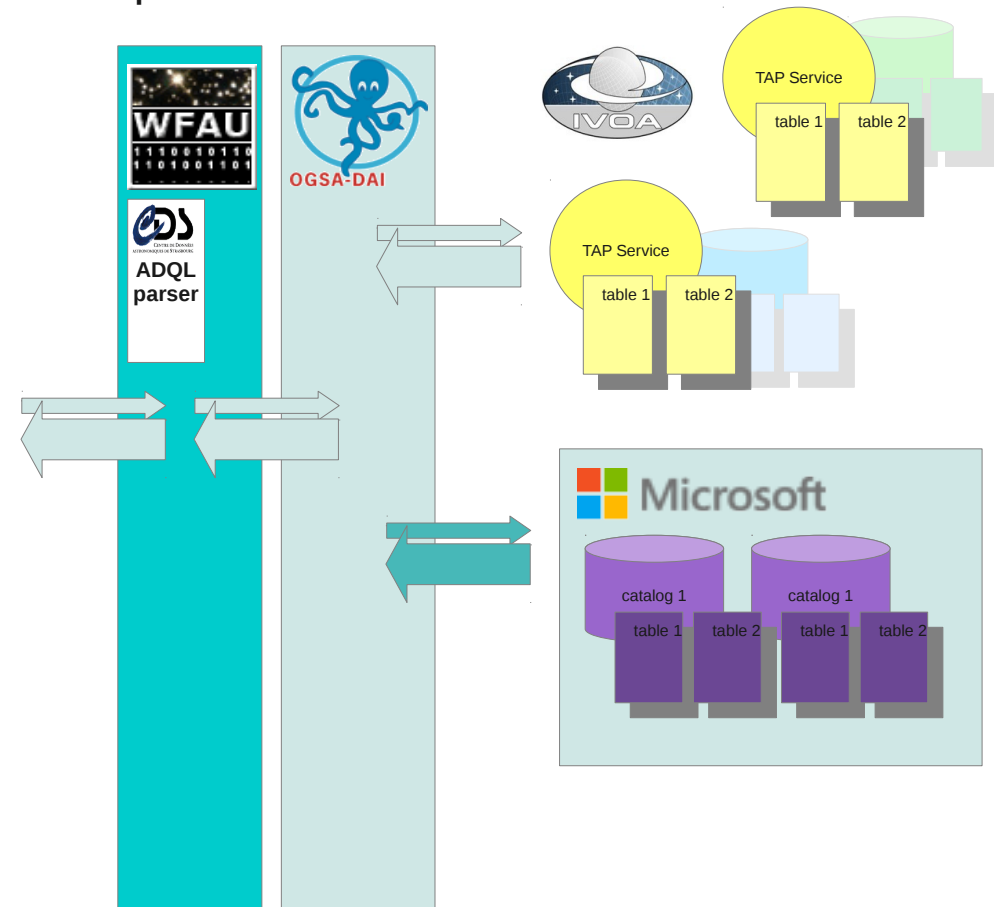
Virtual Observatory Data Access service



New data access service

- New metadata service to create a virtual 'data space'
- Combining local and remote data
- Local JOINS executed within SQL Server
- Remote JOINS processed by DQP

```
SELECT
    resource1.table1.column1,
    resource2.table2.column2,
FROM
    resource1.table1
JOIN
    resource2.table2
    . . .
```



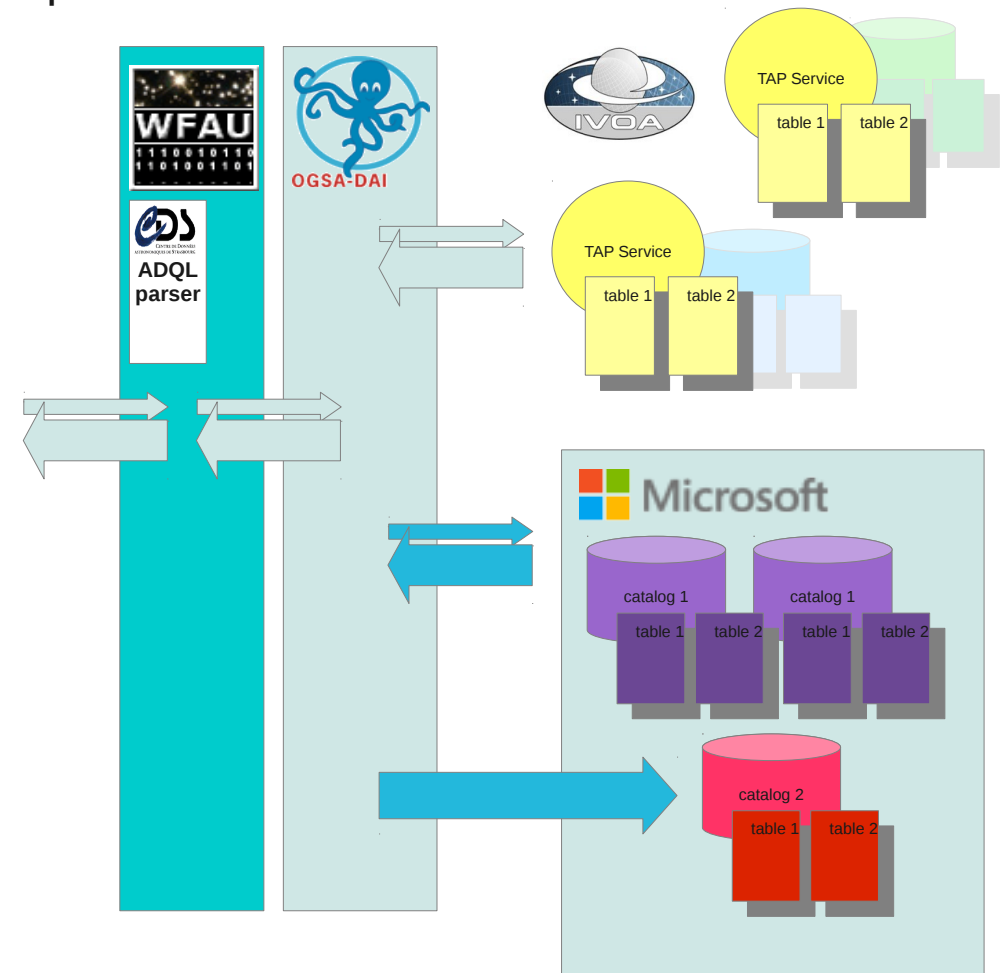
Virtual Observatory Data Access service



New data access service

- User data appears within the same virtual space
- Results from ADQL queries automatically stored in users space
- Available for query in combination with local catalogs and remote TAP services

```
SELECT
    resource.table1.column1,
    userdata.table2.column2,
FROM
    resource.table1
JOIN
    userdata.table2
    . . . .
```



Virtual Observatory Data Access service



Target use cases :

- JOIN queries combining data from the catalogs at ROE processed locally within SQL Server
- JOIN queries combining data from the catalogs at ROE with data from external TAP services
- Space for storing user data, including query results and uploaded data

