Wide Field Astronomy Unit (WFAU)

Virtual Observatory
Data Access service

D.Morris
Institute for Astronomy,
Edinburgh University
May 2013

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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

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Institute for Astronomy,
Edinburgh University
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Implemented using

- ADQL parser from CDS

- SQL Server cluster at ROE

- OGSA-DAI DQP service from EPCC

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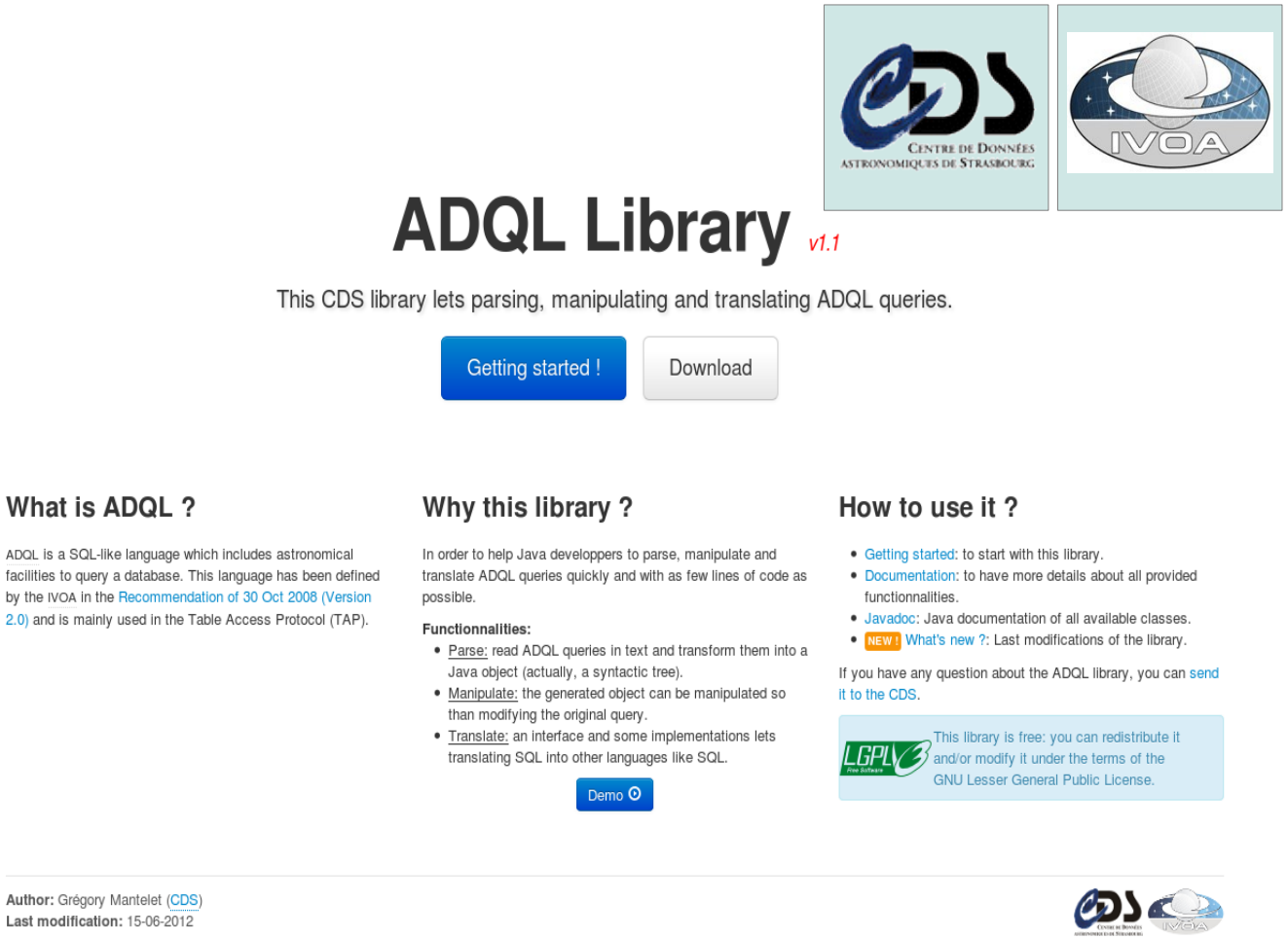
ADQL library from CDS

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



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.

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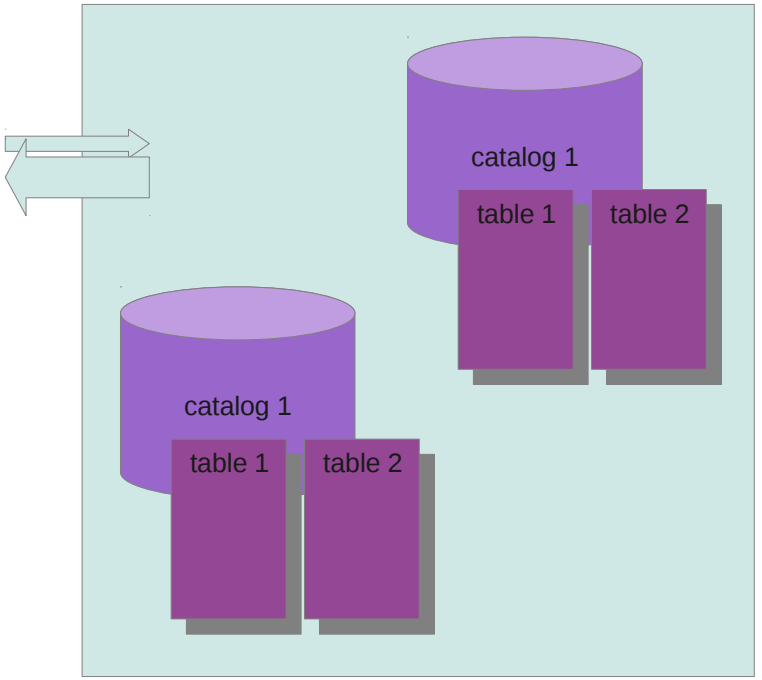
Microsoft

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
    ....
```



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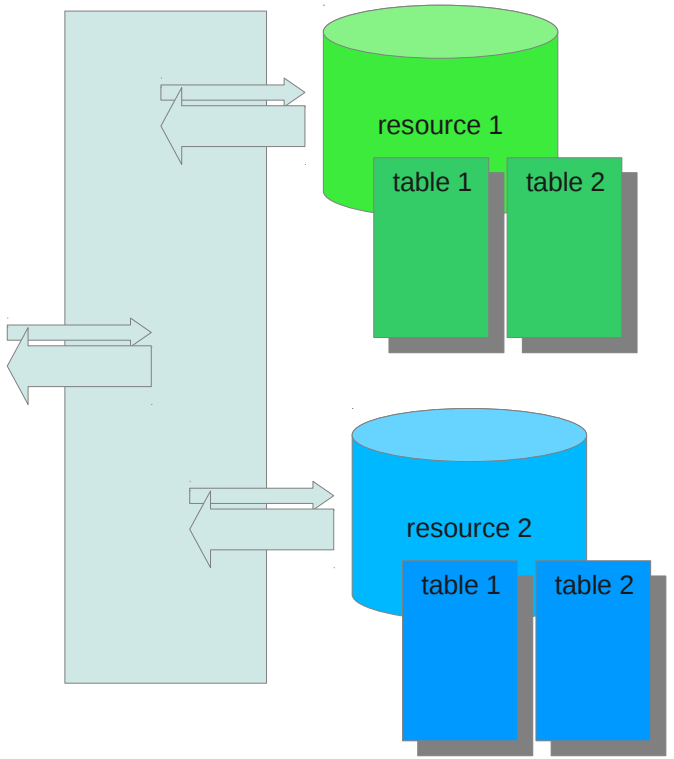
OGSA-DAI service from EPCC

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



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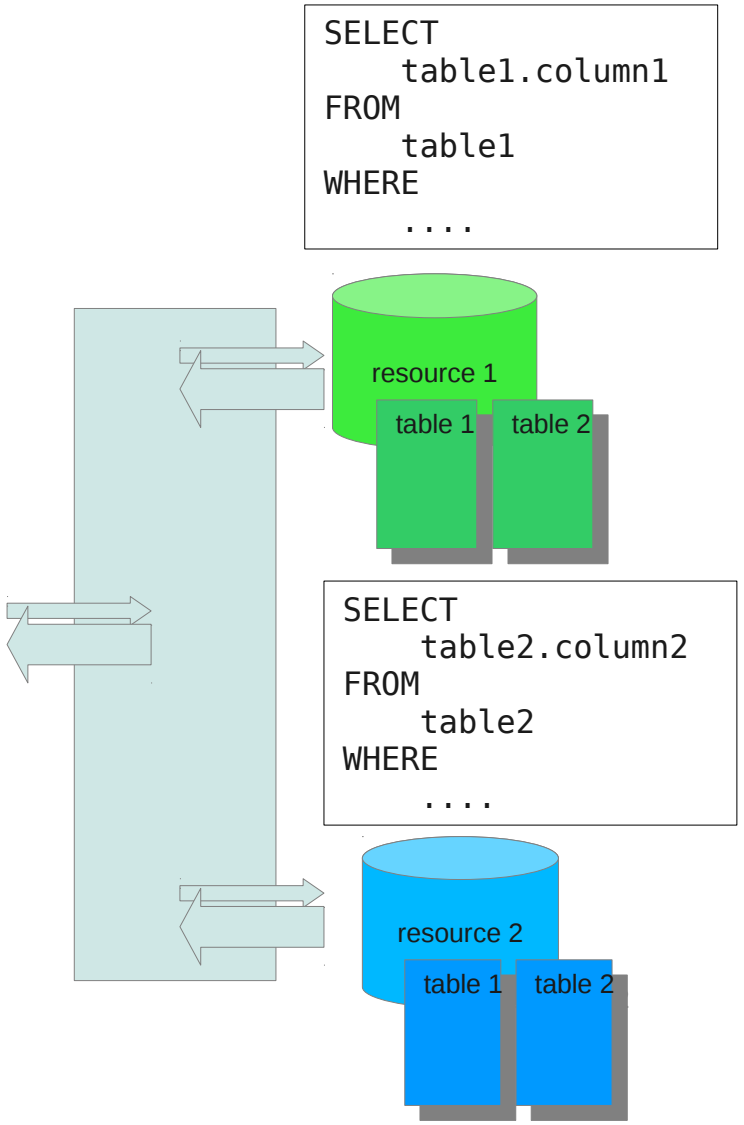
Distributed Query Processor (DQP)

- 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
    ....
```



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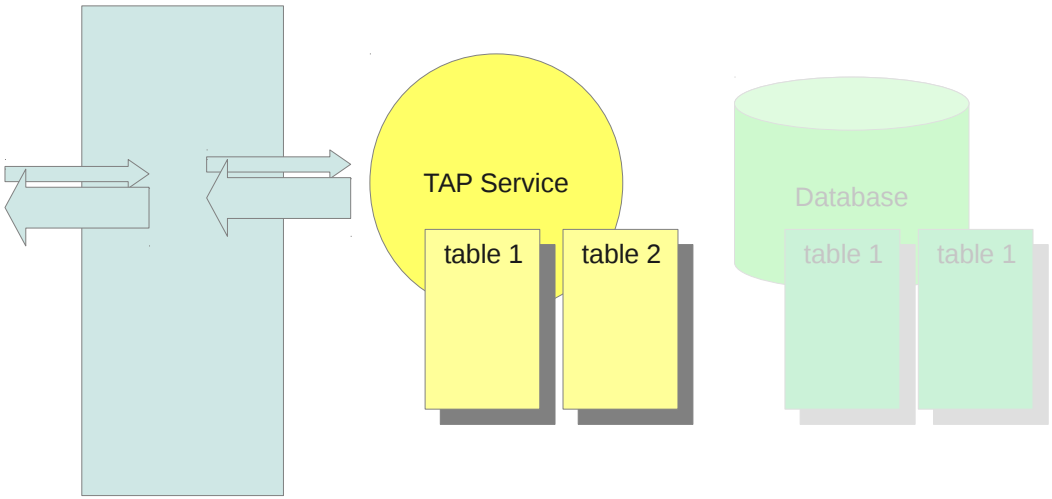
OGSA-DAI astronomy extensions

- Developed for ROE by EPCC
- Enabling OGSA-DAI to use IVOA data formats and services
- Presented at EuroVO ICE Tech forum in October 2010

IVOA TAP services

- Provides a common abstraction for external systems.
- Hiding the implementation details of the underlying database systems.
- Services from different data providers look and behave the same way.



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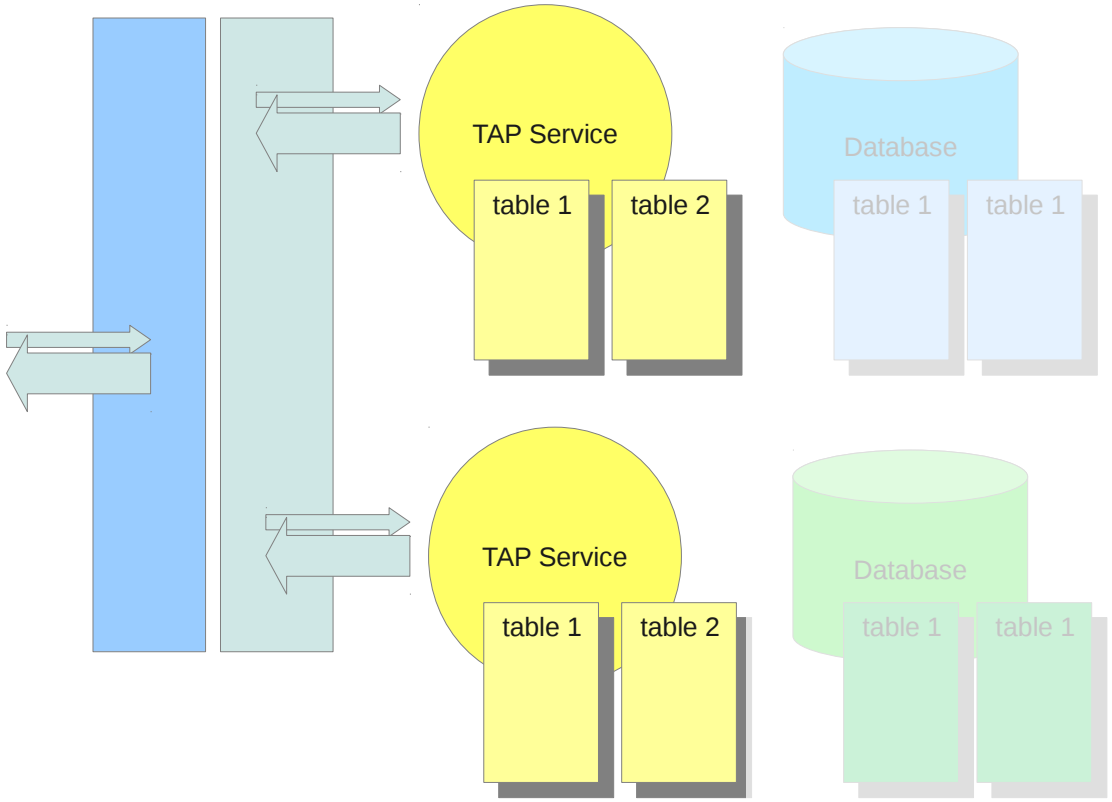
OGSA-DAI TAP Factory

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

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



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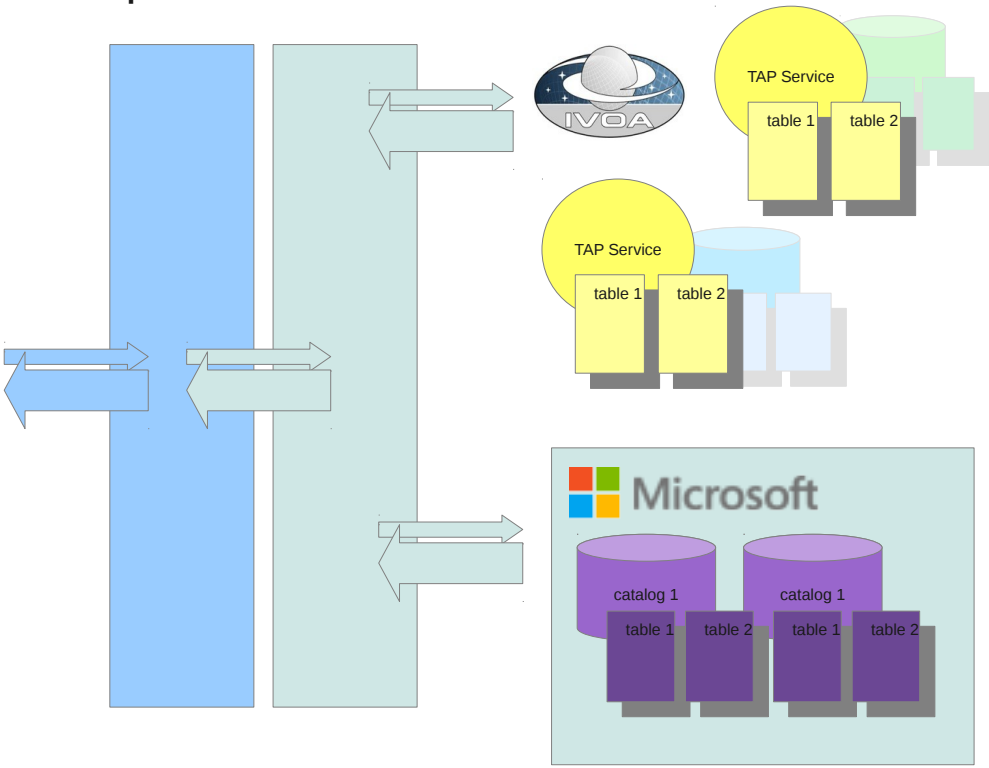
New data access service

- 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
    ....
```



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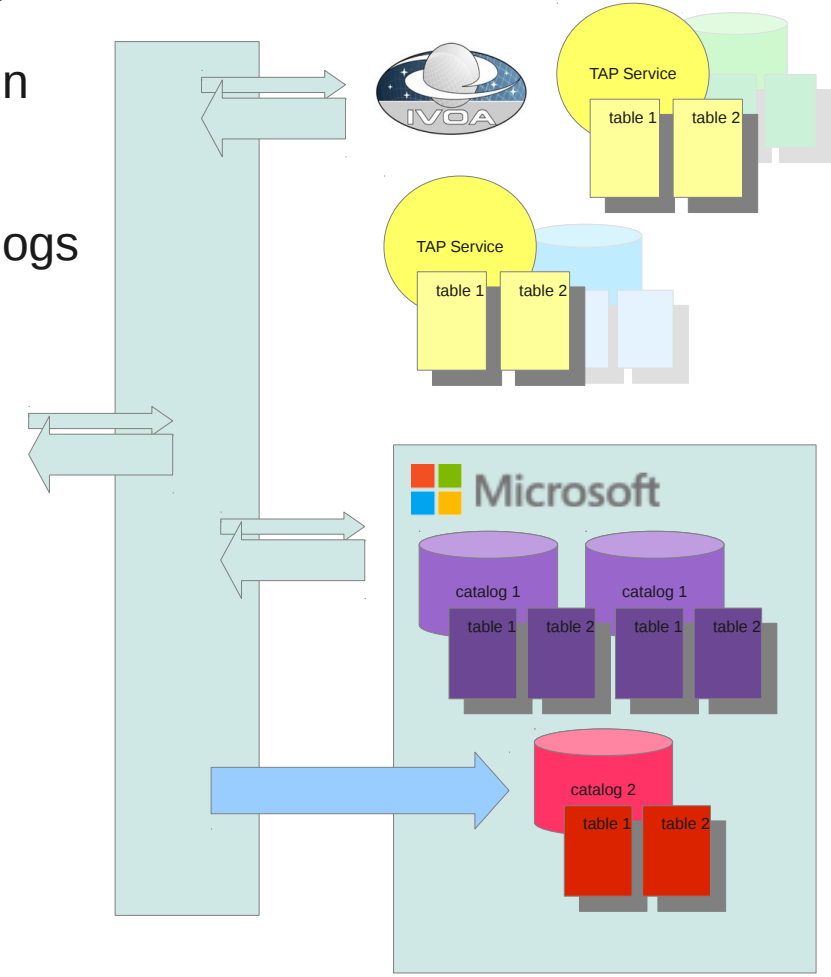
New data access service

- User data appears within the same virtual 'data 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
    ....
```



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