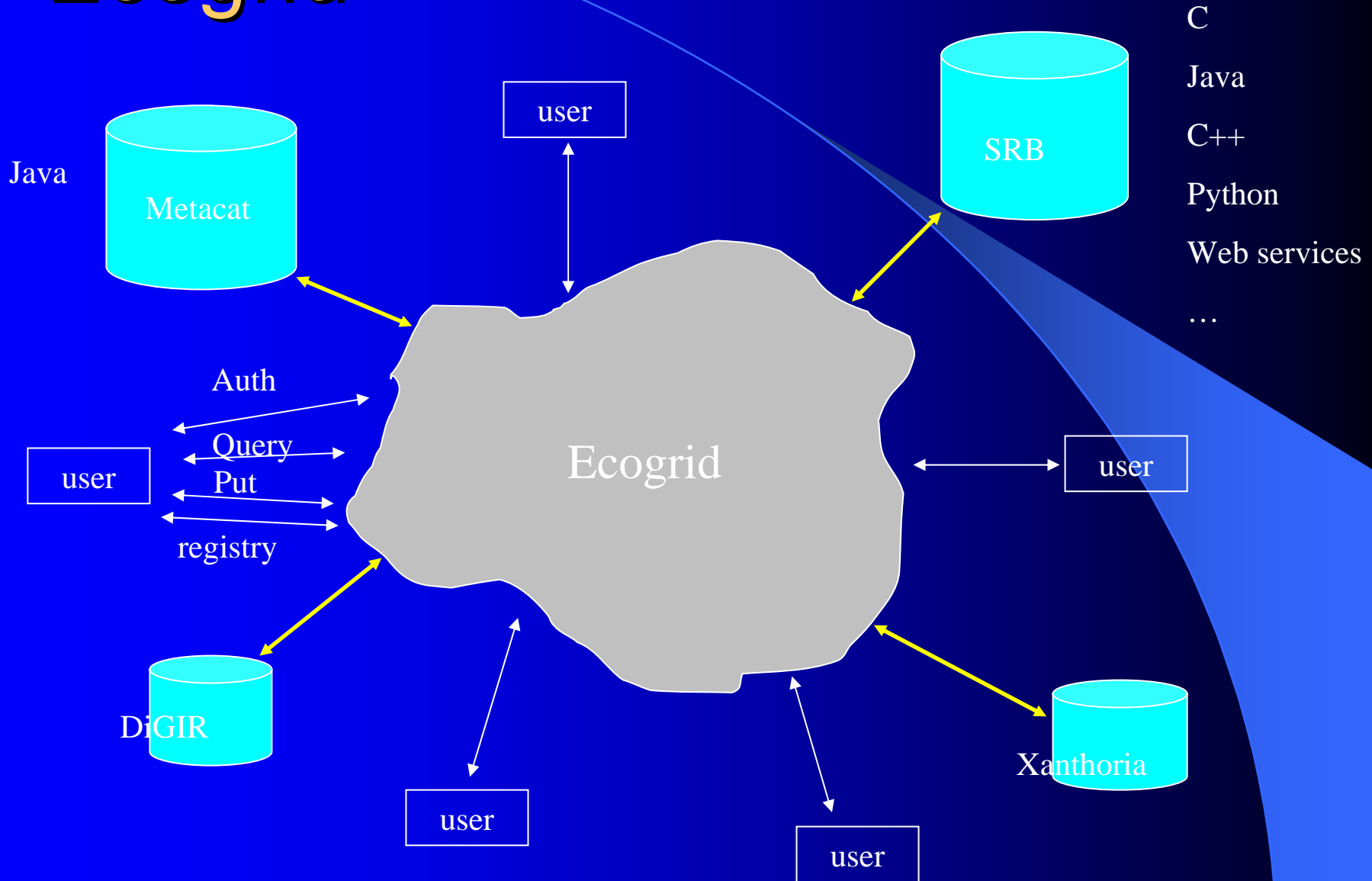


Ecogrid



Ecogrid Services: Level I

- Auth:** The Ecogrid Authentication service has two operations, 'login' and 'logout'. The login operation authenticates a user and issues a session ID, which can be used for other Ecogrid operations such as data uploading. The logout operation is used to terminate the session ID.
- Query:** For users to download data or submit queries to Ecogrid and retrieve query results. There are two operations, query and get, in Ecogrid Query service.
- Put:** The Put service enable users to upload/create files, to upload xml documents or to add metadata for existing data objects.
- Registry:** Ecogrid registry service provides users an easy access to Ecogrid service repository such as add or delete an registry entry and query registry.

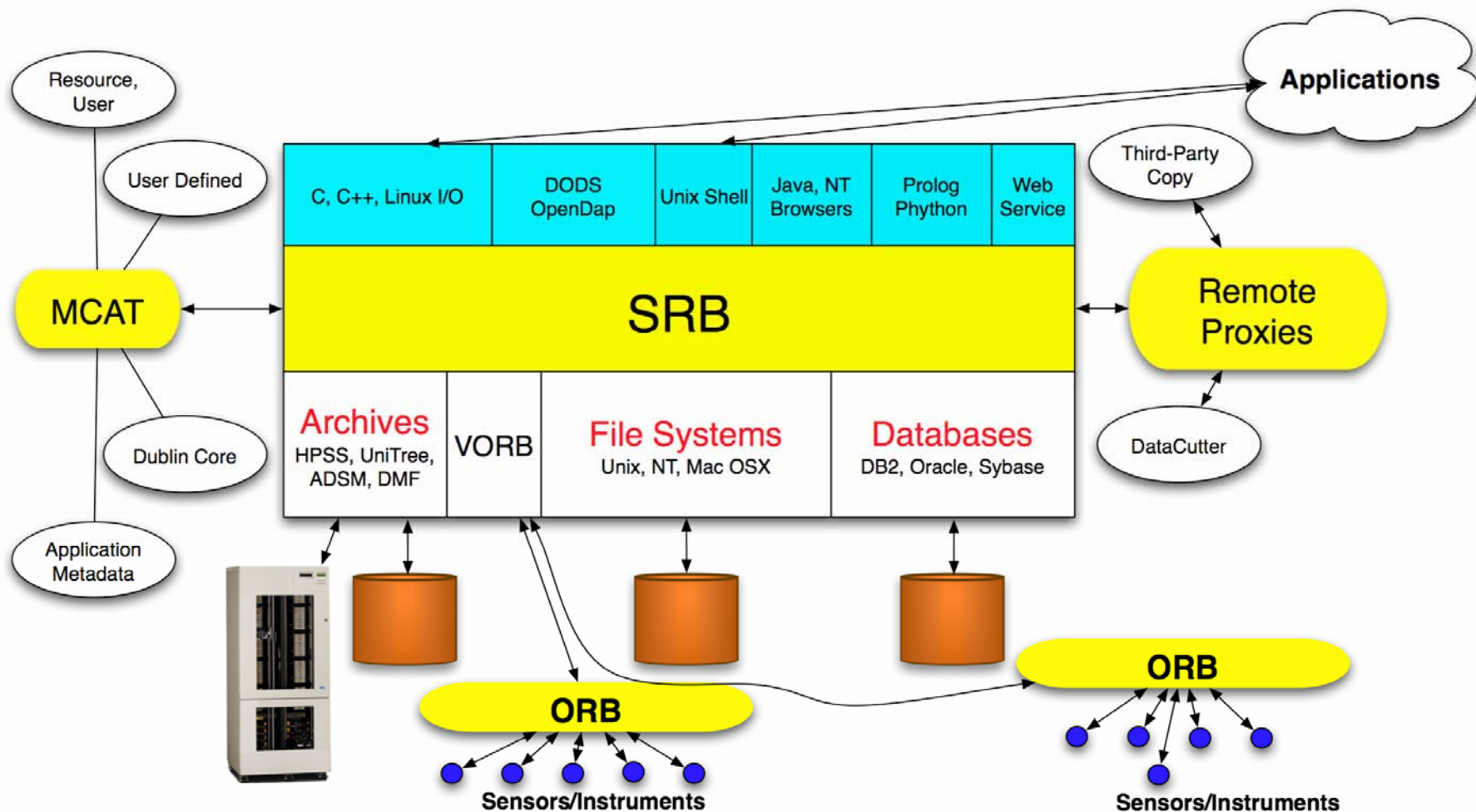
How to Use the EcoGrid

- Data Access (next time: Computation)
 - First Query the EcoGrid Registry to Find
 - EcoGrid Resources of Interest
 - You get a Grid Service Handle (GSH)
 - Second Query A Resource (GSH) to Find
 - Data Objects of Interest
 - Third Get Data Objects from EcoGrid Resources
-
- Ingest Data Objects into Resources
 - Associate Metadata into Resources

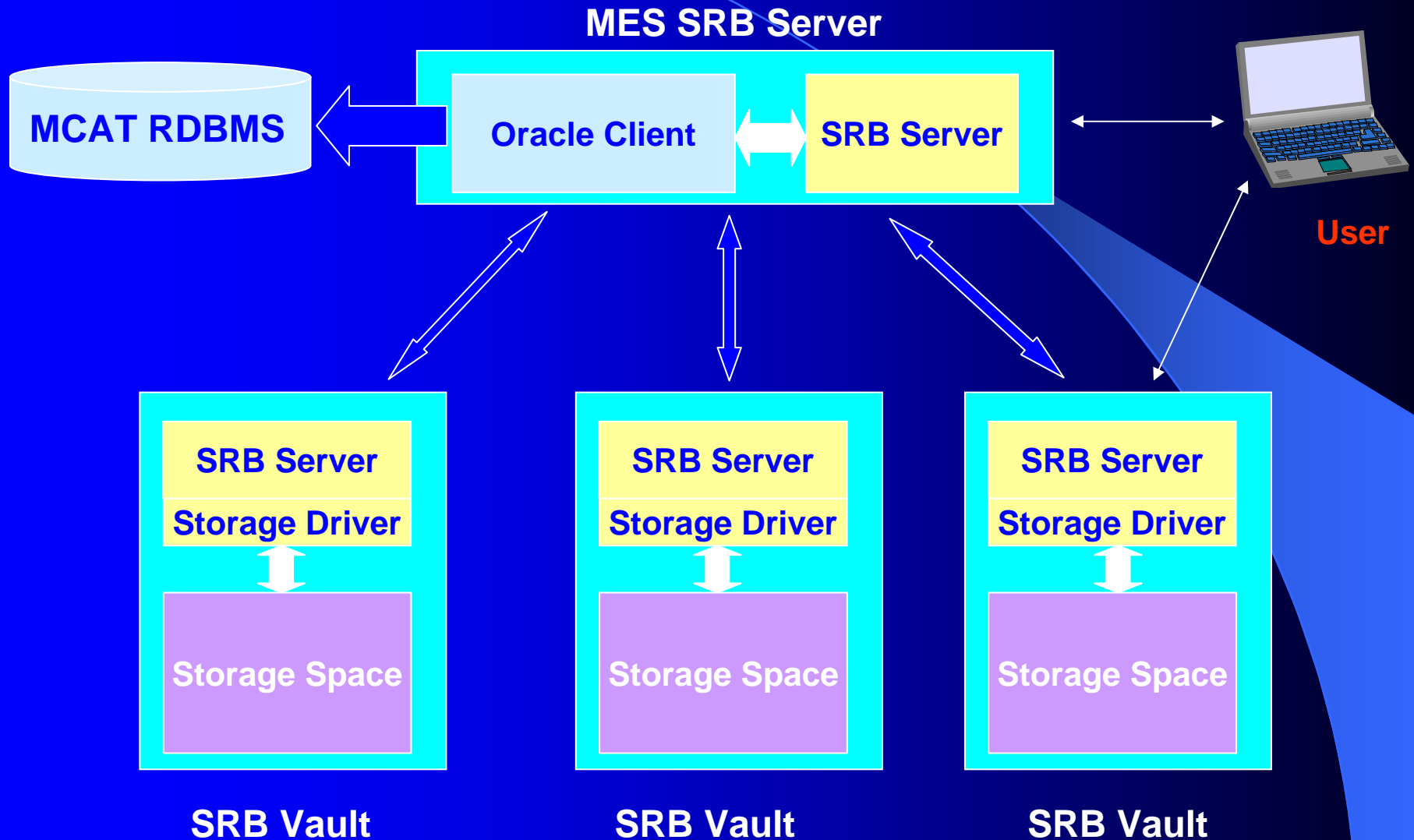
Current Resource Types

- SRB - Storage Resource Broker
- MetaCat
- DiGIR - Distributed Generic Information Retrieval
- EcoGrid Registry

SRB Block Diagram



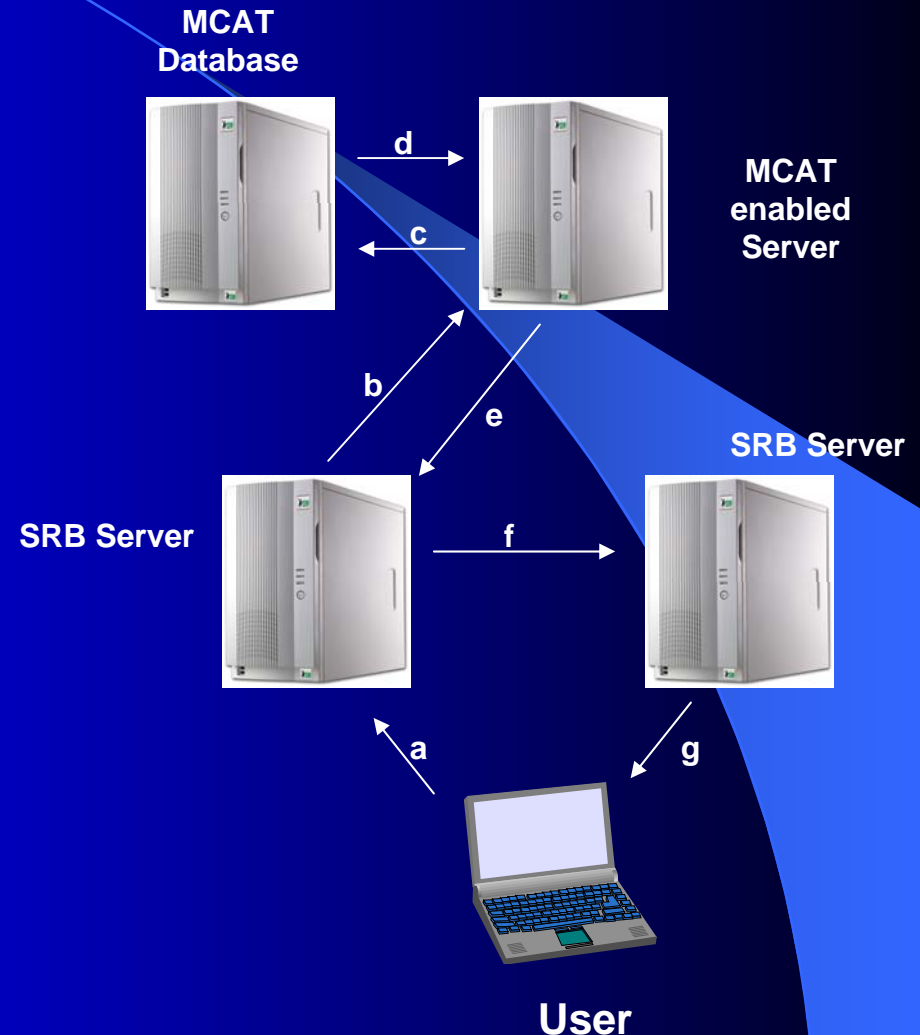
SRB Physical Structure



SRB Communication

User File Request

- a) SRB Client sends request for file to SRB server.
- b) SRB Server contacts MCAT Enabled Server (MES).
- c) MES translates query into SQL and sends to database hosting MCAT
- d) Database query returned to MES
- e) Location of file etc returned to SRB Server A.
- f) SRB Server A contacts SRB Server B hosting data file.
- g) Data file transferred to user.



Metacat (*Metadata Catalog*)

- Key component of the Knowledge Network for Biocomplexity (KNB) Project
- A Schema-Independent XML Database System
- Addresses the three challenges of ecological data management
 - Mostly independent researchers with their own database systems (**autonomy**)
 - Located in all parts of the country and world (**dispersion**)
 - Localized data collection and storage protocols (**heterogeneity**)

Metacat Key Features

- Stores any well-formed XML document in DB
- Stores any data file into file system
- Java servlet front-end to any JDBC/SQL92 Compliant RDBMS (PostgreSQL, Oracle, MS SQLServer, ...)
- XPath type queries of stored XML documents
- XML input and output
- Automatic XSL transformations of stored XML
- Built in replication scheme
- Document and user level access control
- All open source, off-the-shelf tools

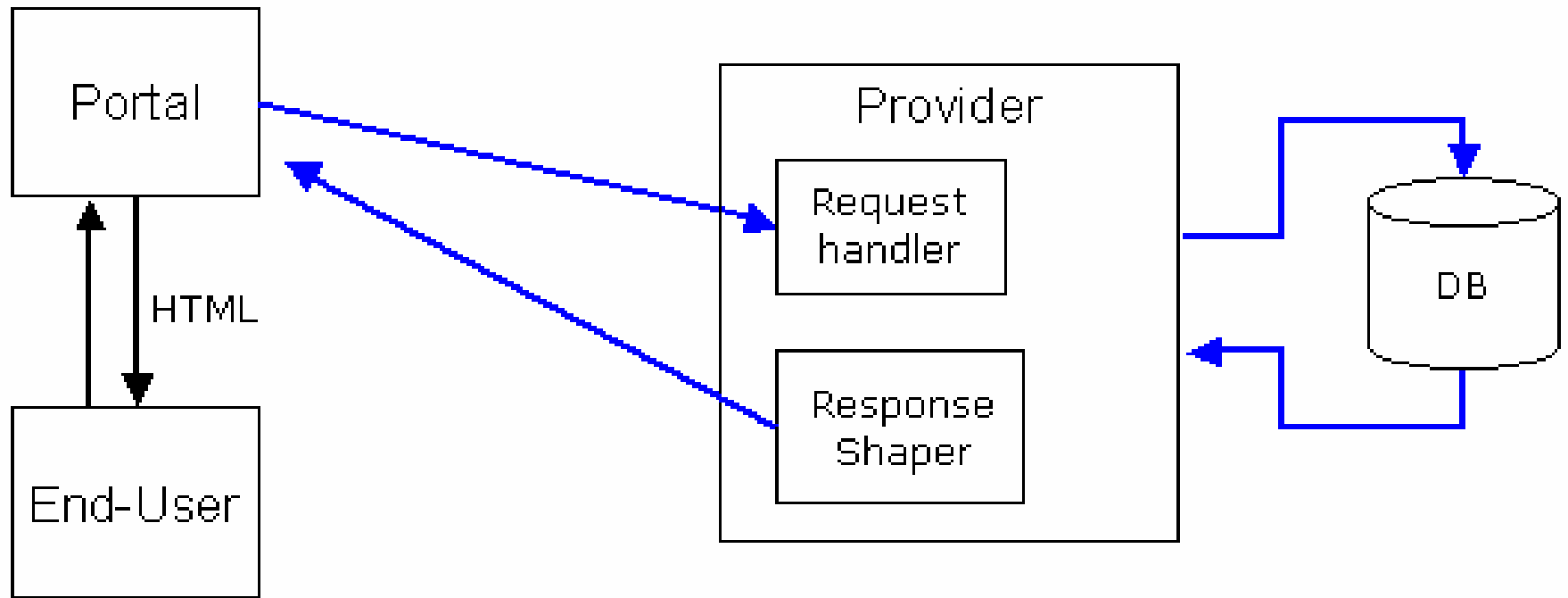
DiGIR

- defines a protocol for retrieving structured data from multiple, heterogeneous databases and to support distributed data retrieval across a loosely coupled federation(s) biological collections databases
- Three Parts:
 - Protocol
 - Provider
 - Portal

Protocol, Provider & Portal

- Protocol
 - Defines request and response message formats for communication between Provider and Portal
 - Assumes Providers conform to a known federation schema
 - Remains flexible to allow schema extension
- Provider
 - Makes structured data available to portals
 - Communicates via protocol compliant messaging only
 - Complies with a known federation schema
 - Supplies meta-data to describe data classification and availability
- Protocol
 - The entry point for a “user”
 - Can make requests of N number of providers
 - Communicates via protocol compliant messaging only
 - Queries registry for available providers
 - Can determine whether a provider should be queried

DiGIR



EcoGrid Query Example

Ecogrid Query adopts a query schema, Query Document Schema, as a common query language within Ecogrid.

```
<AND>
```

```
  <condition operator="LIKE" concept="mdasCollectionName">/home/whywhere.seek</condition>
```

```
  <condition operator="LIKE" concept="ORIGINAL DATA SET">% World Geodetic  
System%</condition>
```

```
  <condition operator="EQUALS" concept="max. value">39.11</condition>
```

```
</AND>
```

```
<title>metadata query
```

```
<AND>
```

```
  <condition operator="LIKE" concept="mdasCollectionName">/home/whywhere.seek</condition>
```

```
  <condition operator="LIKE" concept="ORIGINAL DATA SET">% World Geodetic System%</condition>
```

```
  <condition operator="EQUALS" concept="max. value">39.11</condition>
```

```
</AND>
```

```
</egq:query>
```

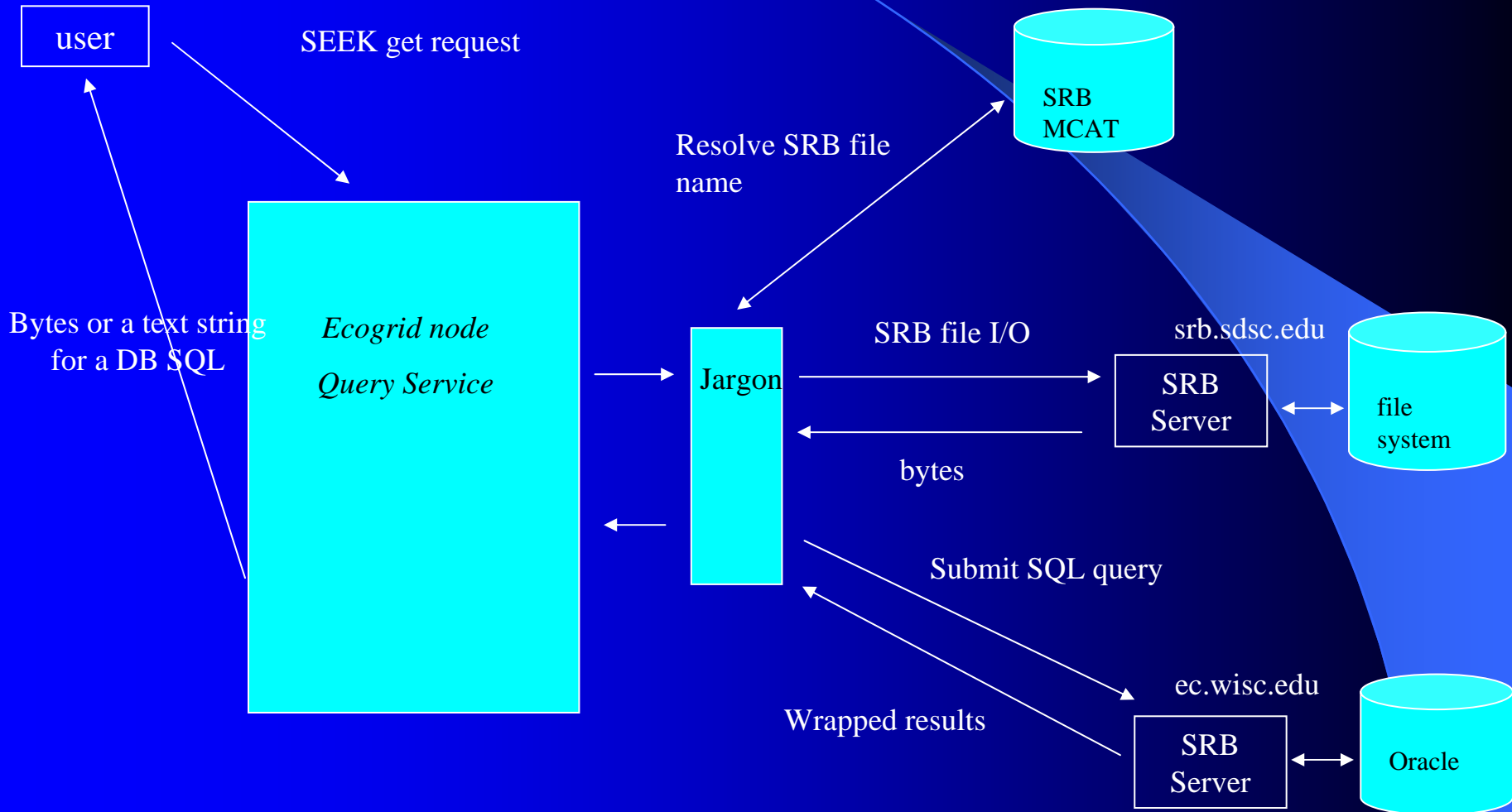
Ecogrid Services implementation for GET

- ❑ A 'get' call from ecogrid to SRB system means to retrieve the content of a dataset.
- ❑ The 'get' function can also be used to submit a SQL query for a relational database (Oracle, DB2, etc), which is pre-registered as a data source in SRB.

Ecogrid Services implementation for PUT

- ❑ Put for data: Ecogrid SRB put service for data allows users to create (upload) files into SRB.
- ❑ Put for metadata: Putting metadata through Ecogrid SRB Put service means to add metadata data for existing a SRB data object (file).

Ecogrid Services implementation for PUT



Demo - Set Up

- Open a Web Browser (IE or Netscape)
 - Open the URLs:
 - http://sasa.sdsc.edu/bzhu/ecogrid_client.tar
 - <http://sasa.sdsc.edu/bzhu/ecocmds.tar>
 - Download to your desktop
(you may need to check where you are downloading)
- Using WinZip, Extract the file to the folder called “ecogrid_client”
(right clicking on file will provide this option)
- Open a “Command Prompt Window”
Start->Programs->Accessories->Command Prompt
- In the Command Window type
`cd ecogrid_client/ecogrid_client`
`dir` (you should see a number of files/folders)
`Setenv`

Open the folder ecocmds on the desktop

Registry Services

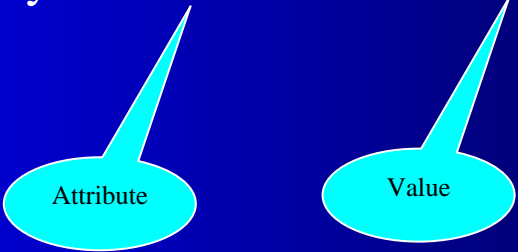
- Query

Registry also has a GSH

<http://sasa.sdsc.edu:8080/ogsa/services/org/ecoinformatics/ecogrid/RegistryServiceLevelOne>

```
java EcogridRegistryClient -l getAll <REG_GSH>
```

```
java EcogridRegistryClient -l query "serviceName" "*SRB*" <REG_GSH>
```



Attribute

Value

Query Services

- Needs a GSH
- Has the form:

```
java EcogridQueryClient  query  <file-name >  <GSH>
```

Get Services

- Needs a GSH
- Has the form:

```
java EcogridQueryClient  get  <file-name >  <GSH>
```

Put Services

- Both Data and Metadata
- Also Needs Login (for authentication)

```
java EcogridAuthClient login <username> <password>  
<GSH>
```

returns SessionId

```
java EcogridAuthClient logout <sessionId> <GSH>
```

- Has the form:

```
java EcogridQueryClient data <file-name> <SessionId>  
<GSH>
```

```
java EcogridQueryClient metadata <file-name>  
<SessionId> <GSH>
```