JVO portal service

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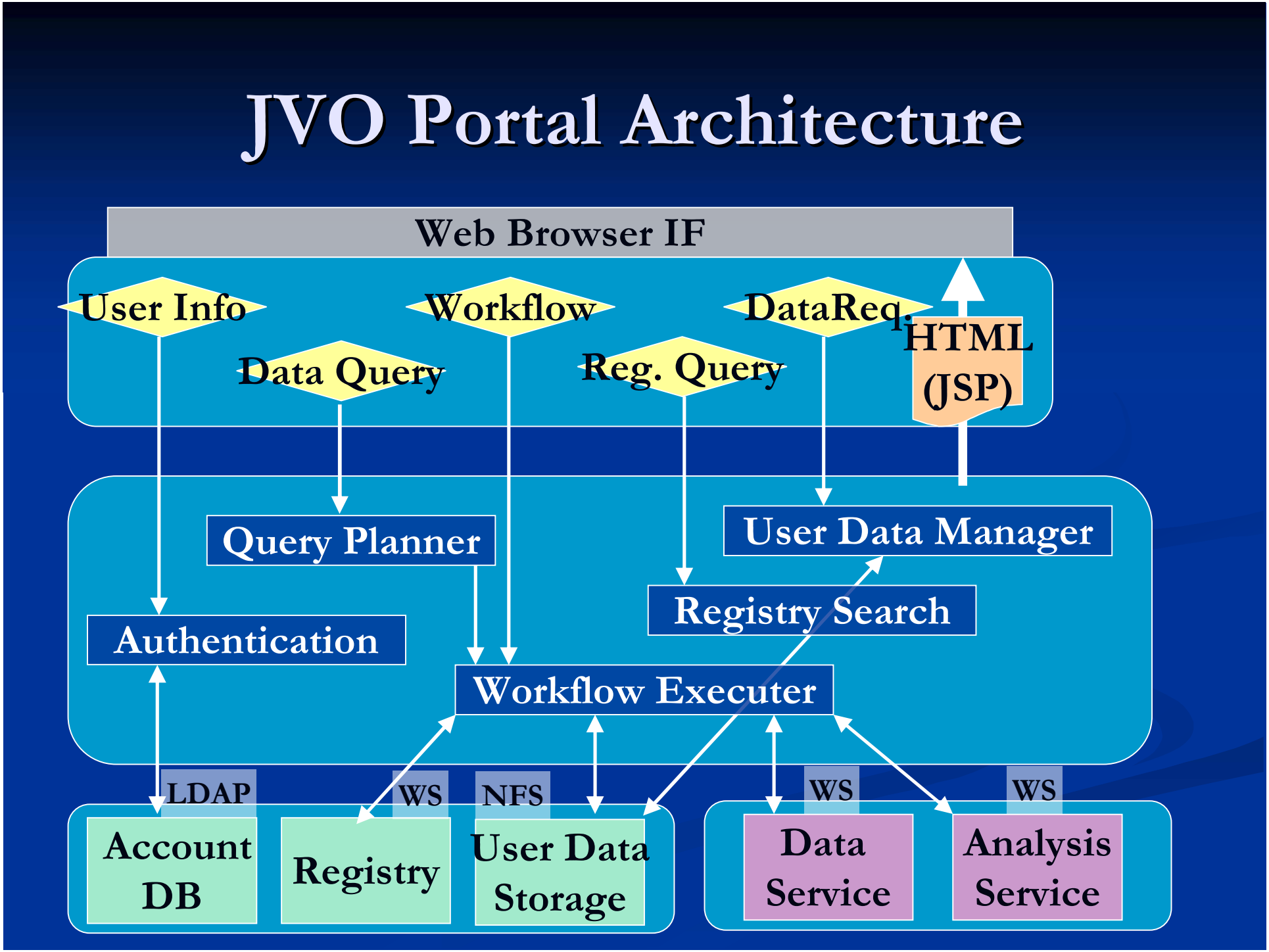
Objectives

- Provide a seamless access to the distributed astronomical data services.
  - Easy access to the hundreds of astronomical data service over the VO.
- User friendly data analysis environment
  - Federation of the data access and data analysis.
  - Graphical user interface for data analysis.
  - Promote multi-wavelength study.

Functionalities

- Registry service
  - Find data resources in the VO
- Data service
  - Access to the multiple data services.
- Analysis service
  - Server side web application
- Storage service
- Workflow service
  - Building your own web service

JVO Portal Architecture



Authentication

- Tomcat authentication system
  - Form-Based Authentication
  - JNDIRealm & OpenLDAP
  - Access control based on the role property.
- TODO
  - Secure authentication
  - Access to the protected services
  - Single sign-on.

Registry Service

- Publishing & Searchable
- XML native database (Karearea) for searchable registry
  - Harvest resource metadata from the publishing registries
  - Harvest table & column metadata from skynode
  - Harvest query parameter from SIAP/SSAP services.
- Web service IF
  - IVOA standard IF (keyword & ADQL search, getResource by identifier)
  - JVO specific IF (getTable, getColumn, getResource by table name …)

Data Service

- Query methods
  - Form-based query for non-SQL users
  - JVOQL query
- Query to the multiple data services.
  - sequential (union) & cross match (join)
- Query planner decompose the JVOQL into appropriate query protocols (ADQL/SIAP/SSAP) of each service.

JVO Query Language

- Extended ADQL-s
- Catalog and Image xmatch

```
SELECT ir.object, ir.flux_iso_45, opt.number, opt.mag_auto_B,
       opt.mag_auto_V,  opt.mag_auto_R,  opt.mag_auto_I,
       opt.mag_auto_Z, x.number, x.rate2300,
       img.object, img.filter_id, img.access_ref, img.format
FROM   ivo://jvo/sxds:sxdsr1 AS opt,
       jvo://jvo/sxds:swire_xmm AS ir,
       ivo://jvo/sxds:xmm_epic_sxds AS x,
       ivo://jvo/subaru:spcam_mos_view AS img
WHERE  Region('Circle 34.2 -5.0 0.05') AND opt.mag_auto_R < 24
       AND distance((ir.ra, ir.dec), (opt.ra, opt.dec)) < 2 [arcsec]
       AND distance((ir.ra, ir.dec), (x.ra, x.dec)) < 2 [arcsec]
       AND distance((x.ra, x.dec), (opt.ra, opt.dec)) < 2 [arcsec]
       AND img.region = BOX((opt.ra, opt.dec), 0.02, 0.02)
       AND img.filter_id = 'W-C-RC'
```

Query Planner

1. Decompose JVOQL into ADQL (Skynode) or parameter query (SIAP/SSAP) for each service.
2. Check xmatch support
3. Execute query to the non-xmatch services
4. Request a query cost for each xmatch service
5. Execute query to the service of the lowest cost.
6. Execute xmatch query according to the order of the cost.
7. Join all the query results.

User Data Management

- Result of query and workflow execution can be stored on the user storage area (UNIX file system).
- Download to the local machine
- TODO
  - Upload from the local machine
  - Query on the user data
  - VOStore interface ?

Workflow

- Masahiro Tanaka's talk.