Technologies & Infrastructures

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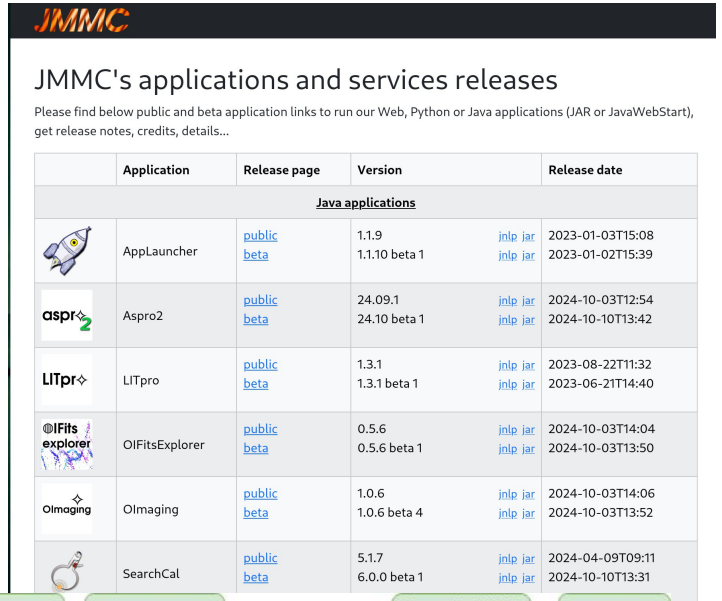
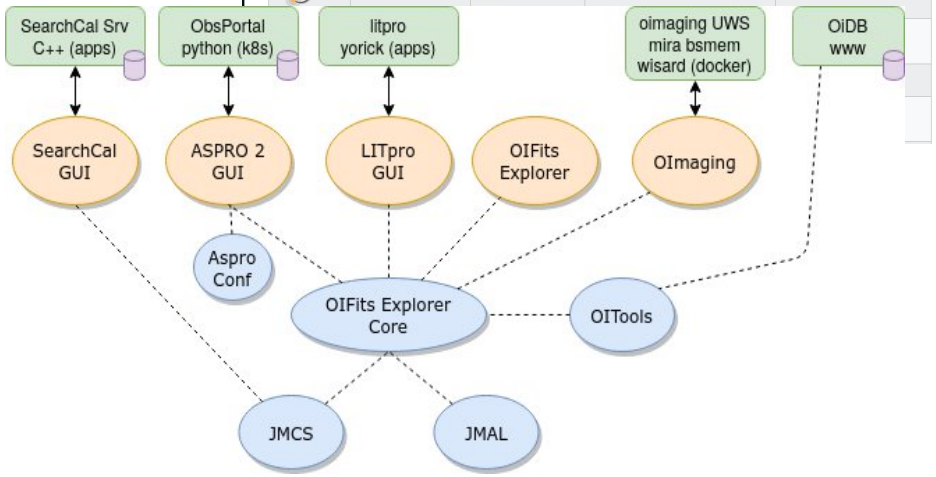
Technologies, languages & libraries

- **Java**
  - Aspro2 (Swing UI, JFreeChart, JAXB, XML)
  - SearchCal, OIFitsExplorer, LITpro, OImaging (jMCS)
- **Python**
  - A2P2 (p2api eso, catalog api), GPAO strehl
  - ObsPortal (pyramid, sql alchemy, astropy, pyvo)
- **C/C++**
  - GetStar & SearchCal services
- **Web** / eXistDB (XML database & xquery server)
  - OiDB, OiVal, searchFTT services & release page
- **Scientific codes**
  - IDL (actually GDL) (jmdc fit, wisard), C (bsmem, alx), Yorick (litpro, mira), Fortran (gdl build, old procedures)
- Many other tools & scripts (doc, cron, sync, stats...)

https://releases.jmmc.fr/index.html





Don’t reinvent the wheel!
Reuse IVOA standards, tools & libraries

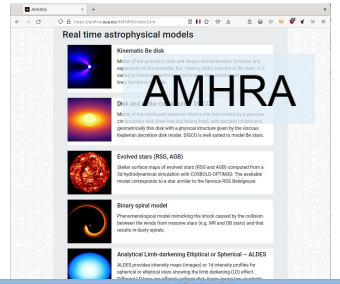
- To handle client / server communication:
  - TAP: Table Access Protocol (OiDB, ObsPortal, SearchFTT, Spica-DB)
  - UWS: Universal Worker Service (OImaging)

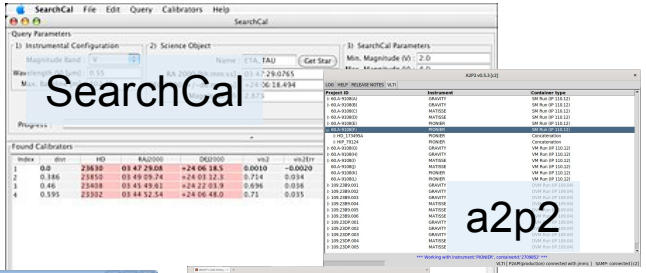
  Rely on TAP Library / Vollt
- To manage target / calibrator lists
  - VOTable [1.2] (Aspro2, SearchCal, SearchFTT & OiDB)
- To exchange target lists, fits images, OIFits files or models between user apps
  - SAMP (java apps & OiDB)

=> IVOA provides a huge and standardized framework for interoperability:

Many open-source implementations available (unmaintained?) **to easily deal with VO data & services in JMMC services !**

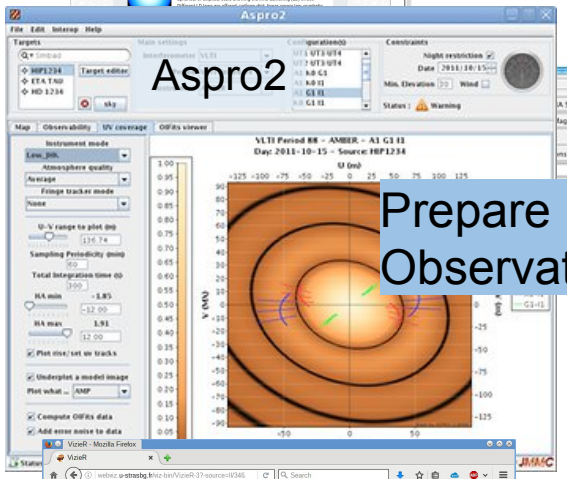
JMMC service overview

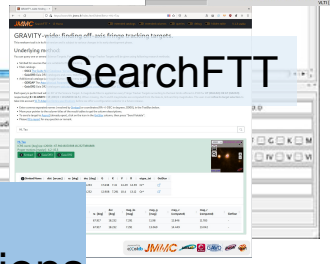




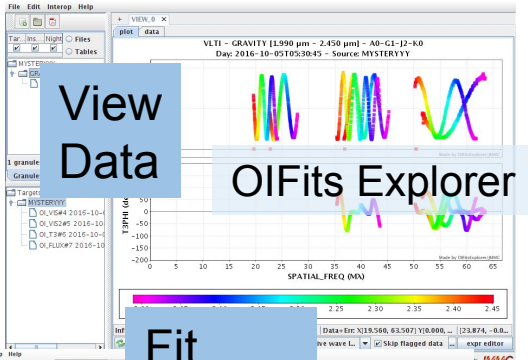
Reduce data

- amdlib
- pndrs



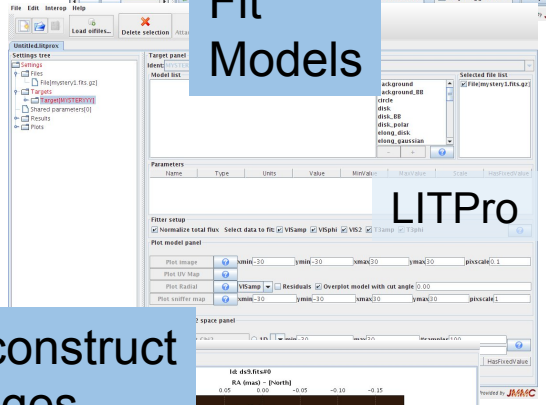


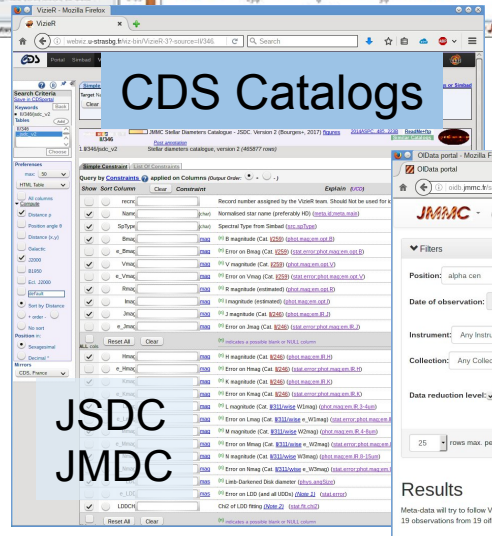
Prepare Observations

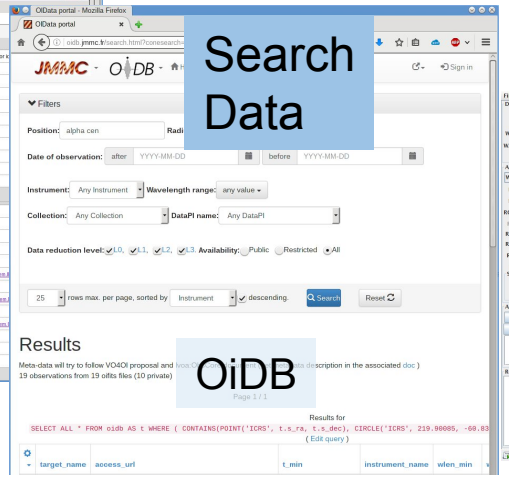


VO SAMP

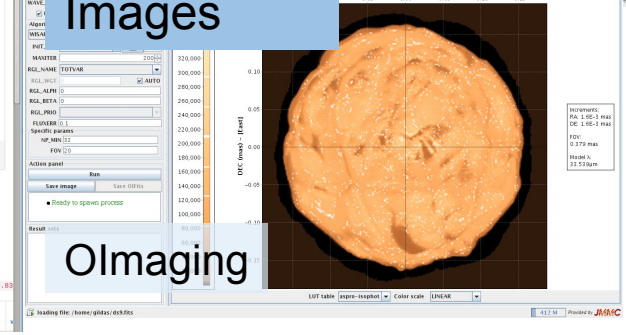
INTEROP







Reconstruct Images



JMMC platform infrastructure

- Network and data centers greatly hosted, thanks to UGA, OSUG & OCA

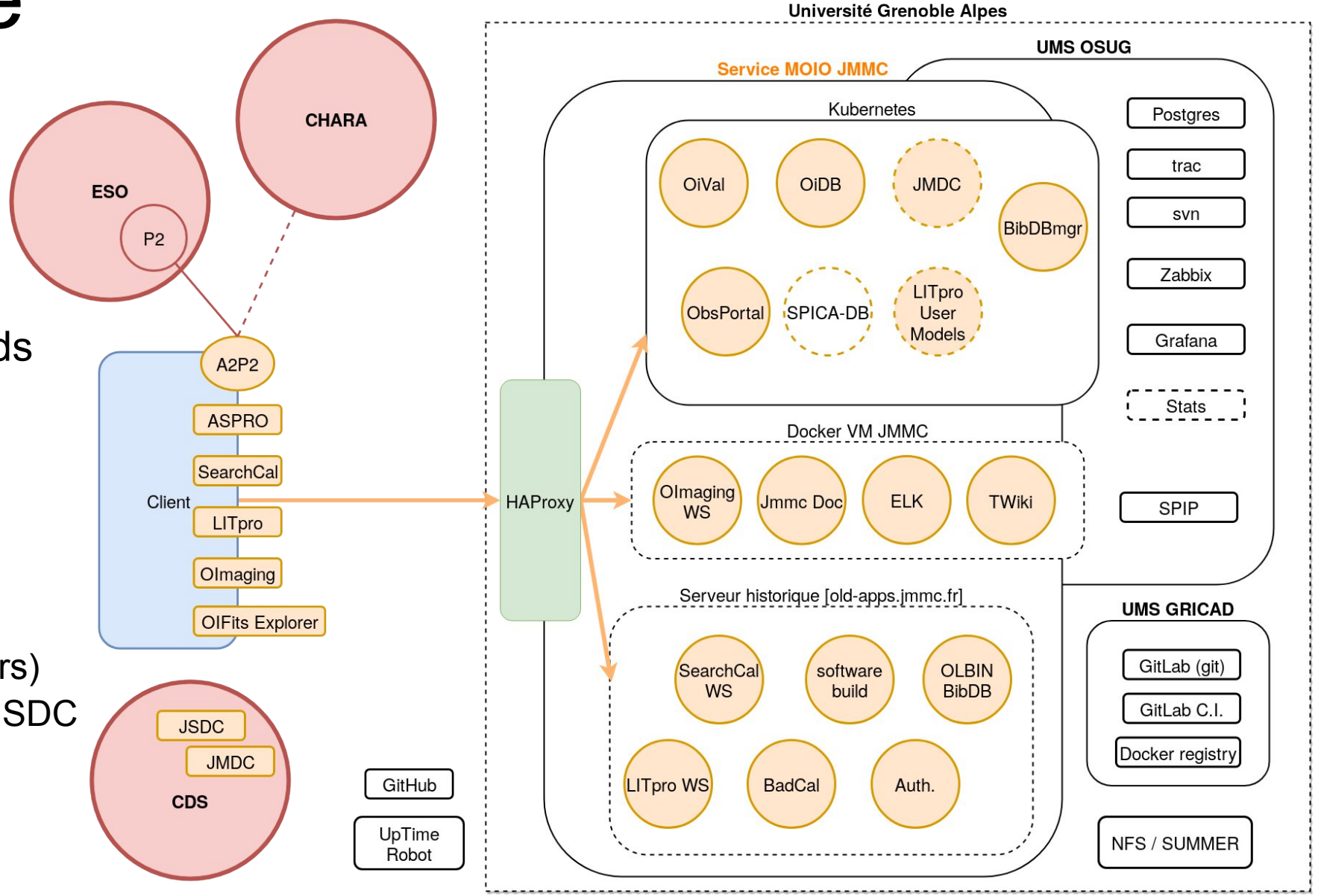
- 2002: Self-administrated server deployed (devops engineers)
- 2009: Leave bare metal to adopt Virtual Machines (proxmox)
- 2015: Migrate from 1 fat monolithic VM to docker containers (HA fail-over)

    Few critical services not yet migrated due to lack of manpower!

- 2019: Adopt kubernetes (K8S OSUG) for new services
  - reliable : liveness probes / standard deployment recipes
  - configurable : kustomize overlays (beta <=> public, blue-green modes)
  - extensible : looking forward using automatic scalability to handle intensive scientific analysis !
- 2024: still lot of old services to maintain & migrate in the JMMC platform...

Infrastructure @OSUG

- Datastore : 2 TB
- HAProxy : ~ 50 backends
- 6 VMs
  - 8 containers
- 15 pods K8S
- Databases :
  - 5 postgres databases (OSUG) + 1 mysql (users)
  - New SPICA, JMDC & JSDC catalogs stored on the shared postgres server

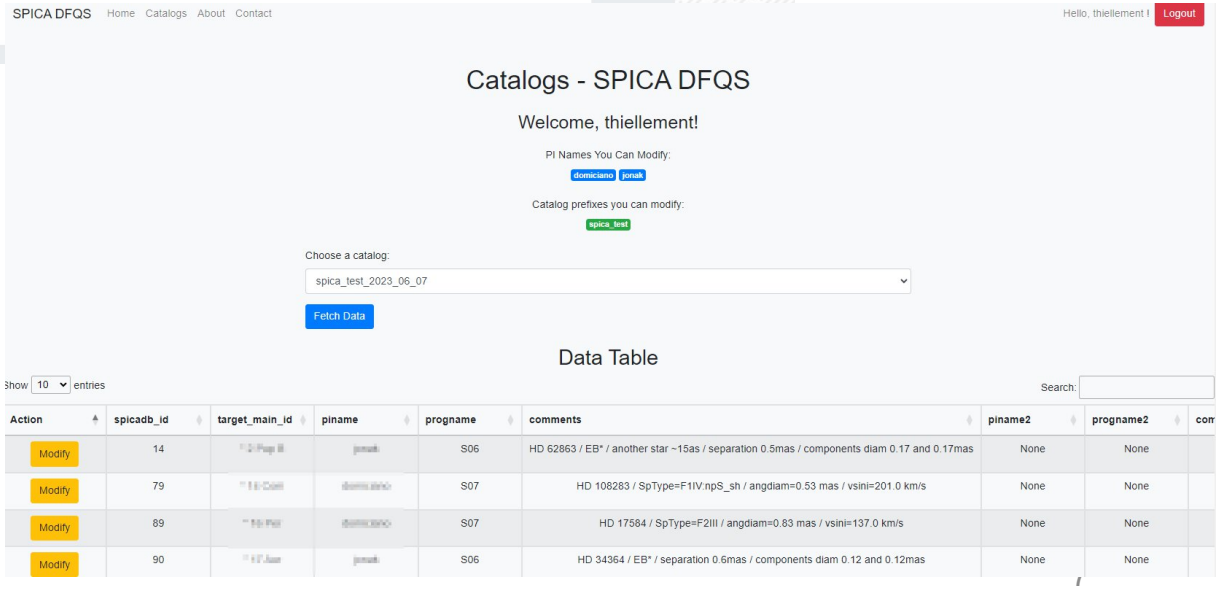


Infrastructure @OCA

MesoCentre SIGAMM

- Services AMHRA
- SUV node:
  - GRAVITY pipeline
  - MATISSE pipeline

- Services SPICA
  - Linked with ObsPortal & OiDB services
  - JMMC web accounts



Development forges

- Few legacy codes still hosted @ svn.jmmc.fr
- Infrastructure projects & services @ https://gricad-gitlab.univ-grenoble-alpes.fr/OSUG/JMMC
  - Continuous Integration => docker images
  - 23 repositories
- Open-Source migration mostly finished @ https://github.com/JMMC-OpenDev
  - JMMC-OpenDev organization created on 2014
  - All java modules on GitHub since 2021.06
  - Last ‘opened’ project: SearchCal server 2024.06
  - 55 repositories
- Trac ticketing system: public web form + internal access
  - Automatic bug report and User support

Perspectives

- Relocate few important services onto new maintainable servers:
  - User accounts management (mysql db + http API)
  - Java application build & packaging
- Follow OSUG's cluster strategy:
  - Move remaining services & docker instances from VMs to Pods
  - SearchCal is currently leaving our outdated app server ! => new docker image instantiated on 'fatmem' nodes (8gb min)
- Finalize the infrastructure migration:
  - Decommission useless, legacy & deprecated services
  - Upgrade / refactor / repackage old but mandatory scientific services

JMMC

Questions ?