

IA2 Italian Center for Astronomical Archives
Centro Italiano Archivi Astronomici

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IA2 (Italian center for Astronomical Archive) is an Italian Astrophysical research e-infrastructure project that aims at co-ordinating different national initiatives to improve the quality of astrophysical data services. It aims at co-ordinating these developments and facilitating access to this data for research purposes. The IA2 is supported by INAF since 2008. IA2's main goals consist in data archiving systems and safety, including data hosting and data curation and preservation, data and metadata distribution over geographical sites, access services including publication within the VO scenario. IA2 provides also services and tool to the community, like data sharing (owncloud), project management (redmine), software collaboration (git-lab) and has available a workflow manager (Yab) for computational needs.

IA2 and INAF are trusted by WDS, PNAS and re3data

contact us: ia2@inaf.it

NEWS
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Workshop "From Science Gateways to Papers"

Abbiamo il piacere di annunciare il secondo Workshop IA2 "From Science Gateways to Papers" che si terrà a Palermo dal 23 al 26 Maggio 2022 con il supporto di IA2 e dell'Osservatorio Astronomico di Palermo.

Per maggiori informazioni visitate la [pagina dell'evento](#).

Telescopio solare OACT

Il telescopio Solare dell'Osservatorio Astronomico di Catania offre delle splendide immagini del Sole nella riga dell'idrogeno H-alpha e nel continuo sin dal 2012. Siamo felici di collaborare per la preservazione di questo importante patrimonio INAF.

il portale è raggiungibile al seguente indirizzo: <http://ssa.oact.inaf.it/oact/>

Persistence @ IA2

E' attiva la nuova Tape Library per la preservazione dei dati INAF presso IA2!

IA2 offre capacità di storage a basso consumo energetico per dati che non abbiano bisogno di essere sempre on-line in modo sincrono tramite la messa in produzione della Tape library dotata dell'innovativo, performante e affidabile IBM Spectrum Archive software-defined storage system.

Ora il Normal o Big Data viene gestito anche tramite servizi on-line asincroni automatizzati! Per maggiori dettagli contattateci (ia2@inaf.it)

w.ia2.inaf.it/index.php/projects

DOI, requisito fondamentale per dataset e software descritti nelle pubblicazioni

Cristina Knapic
24/05/2022



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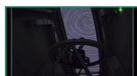
[contact us](#)

MAIN ACTIVITIES

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TELESCOPE ARCHIVES & SIMULATIONS

MAIN



TNG



LBT



Asiago

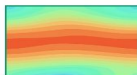


SVAS

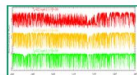


RADIO

MAIN



Exoclimates

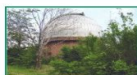


INTRIGOSS



LBT OLD

HOSTED



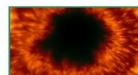
Byurakan



INES



BaSTI



IBIS-A



other archives @ INAF

OTHER SERVICES



ownCloud



redmine



VO initiatives



GitLab



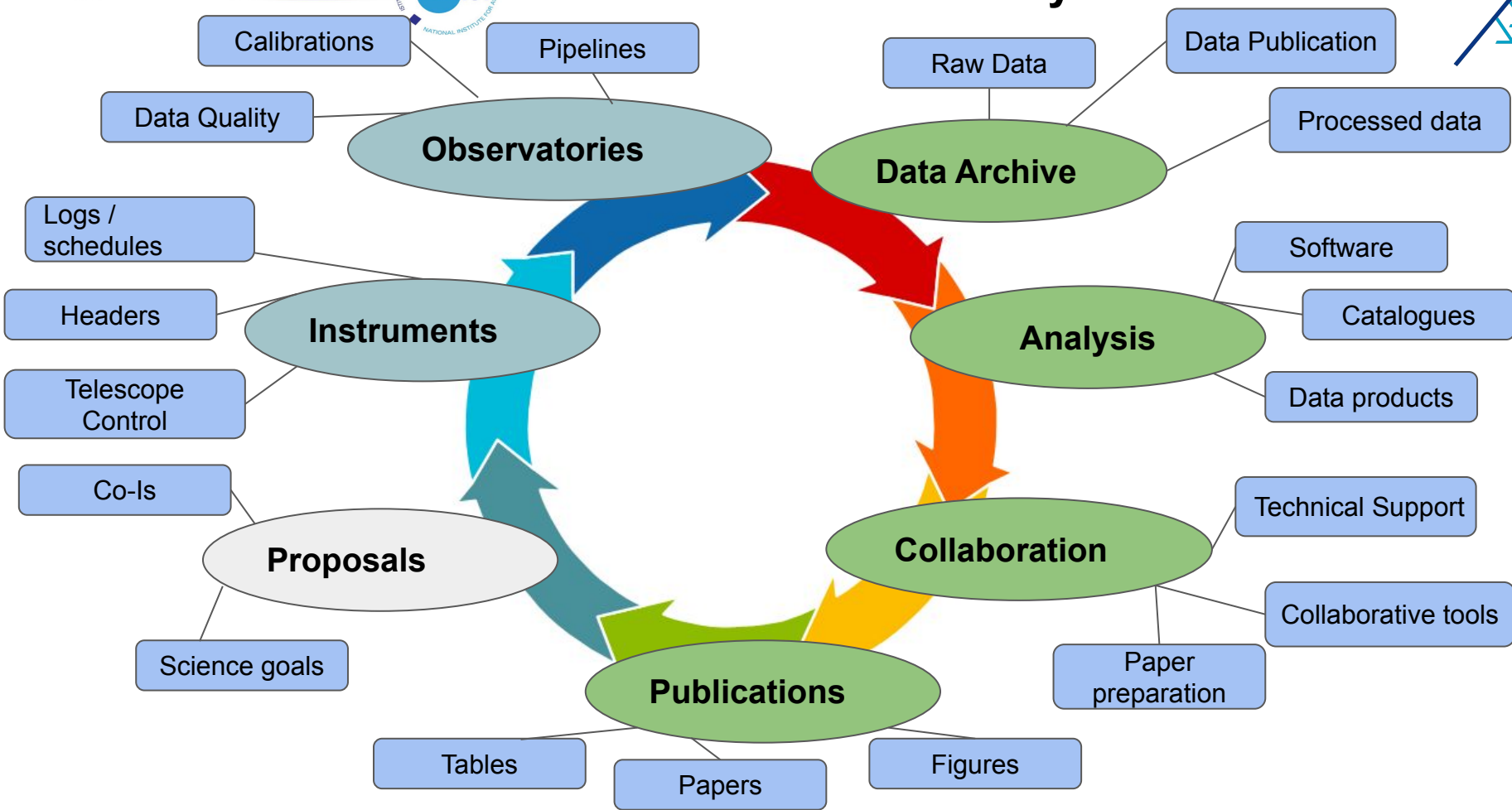
yabi

PROJECTS

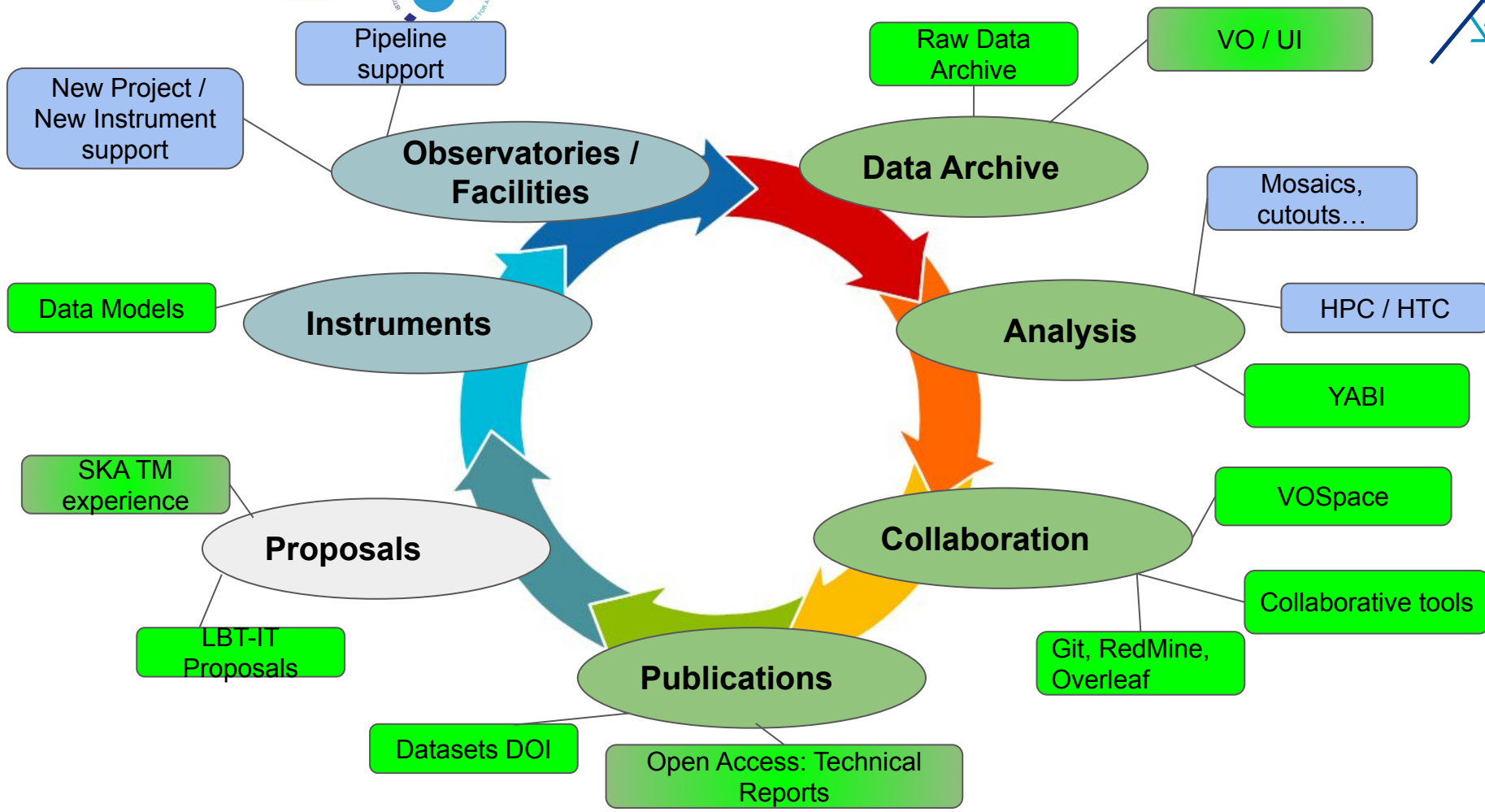
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<https://ia2.inaf.it/>

Astronomical Data Life Cycle



IA2 activities:



Supported Projects



IA2 hosts data and services for several Projects:

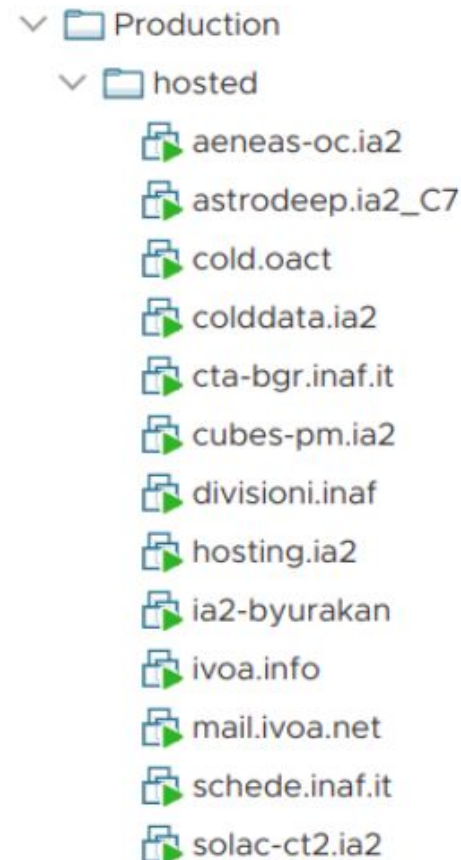
- ECOGAL;
- EUROPLANET;
- ARI-L;
- CUBES;
- MINCE;
- ViaLactea / VLKB;
- SKA DC;

It also hosts web pages and services:

- Home page of the Astronomical Observatory of Rome;
- Solar Telescope of the Catania Astrophysical Observatory;
- Schede INAF;
- Computing Catania
- Open Access storage;

IA2 activities to support INAF

- INAF survey;
- INAF researchers to store simulated data out of CINECA



Contribution to Projects



IA2 personnels were/ are involved in:

- AENEAS;
- INDIGO Data Cloud;
- SKA TM;
- SKA RC;
- PNRR;
- IVOA;
- EuroPlanet;
- ARI-L;
-

IA2 host also all ICT in house services

IA2 participated to

- Google platform PoC
- IBM Spectrum Scale PoC

IA2 expertise:

- data archive handling;
- database management;
- data center architecture;
- System Administration;
- web based application development;
- data distribution software development;
- Distributed and parallel filesystems (GPFS, LUSTRE);
- authentication and authorization systems;
- astronomical interoperability standards;
- services provision;
- user support;
- workflow management system & pipelines;
- scientific use cases (radio and optical)

Infrastructure: HW



Storage

LUSTRE:

600TB + 1,2PB on JBOD

Synology: 270TB

QSAN: 400TB

Transfer Node:

IBM 100TB all flash

Cross Backup

Synology +LUSTRE --> QSAN;

QSAN --> Synology

Total: 2.6 TB on-line

Virtualization

3 SuperMicro server 40CPU 512GB RAM

2 Lenovo 32 CPU 1 TB RAM

Storage for VMs

100TB all flash

10TB on HD

DB machines

2 servers DELL 2CPU (2x32 core)

256GB RAM

3.5 TB all flash

Total: 90 on-line VMs

Infrastructure: HW



TS450 - 6 drive LTO7

240 Cartridge of ~ 9GB

Total: ~**2PB**

Data in Tape:

400 TB used (78 cartridge)

1600TB free (162 cartridge)

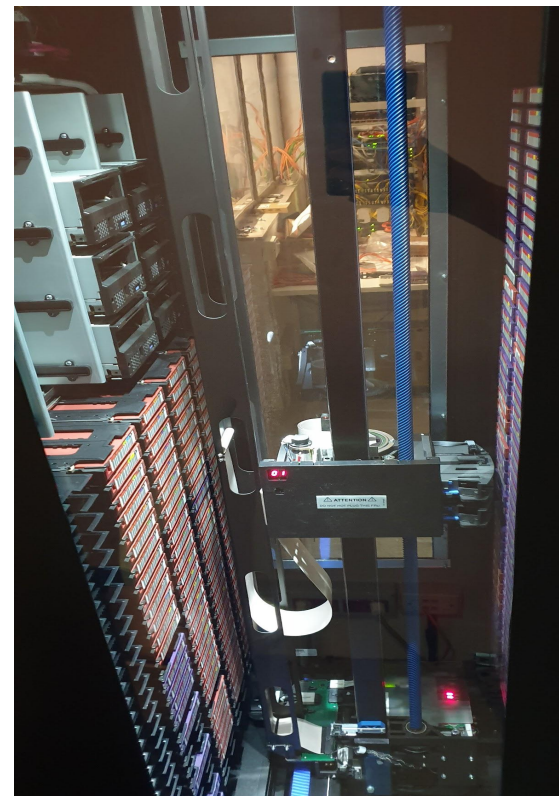
Free space is not real since we must check data before copying them on Tape (see ARI-L project).

Front-end: Lenovo server 92 TB all flash

70 TB licensed IBM Spectrum Scale and Archive (File System)

Partitions:

Filesystem	Size	Used	Avail	Use%	Mounted on
lv_archive_01	25T	24G	25T	1%	/ia2_tape_archive_01
lv_generic_rw_01	13T	3.1T	9.2T	26%	/ia2_tape_generic_rw_01
lv_stb_01	32T	14T	18T	44%	/ia2_tape_stb_01



Infrastructure: HW



- Future expansions:
 - Tape library:
 - Completion of the LTO7 rack;
 - LTO8 new rack;
 - Transfer node expansion to full capacity all flash (+ 100TB)
 - Virtualization system:
 - acquisition of at least 2 servers (2x32 core; 1TB RAM)
 - storage expansion all flash (+100TB)
- Net: request for a data dedicated subnet through INAF data centers.

Infrastructure: SW



- **ICT services (on IA2 infrastructure)**
 - 280/day di accesso alla home page ICT
 - **owncloud** (130 utenti)
 - **redmine** (~250 Utenti)
 - **gitlab** (~250 Utenti / ~ 370 progetti)
 - **indico** (~ 1100 inaf; ~700 esterni)
 - **DOI service** <https://doi.ict.inaf.it/>

Infrastructure: SW

Virtualization: VMWARE

Monitoring: Ganglia & Nagios

Logging: Kibana on db

License server

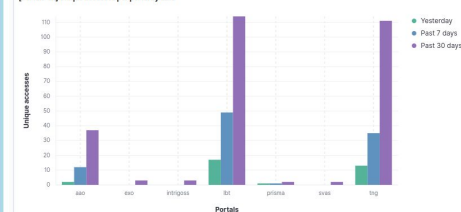


kibana

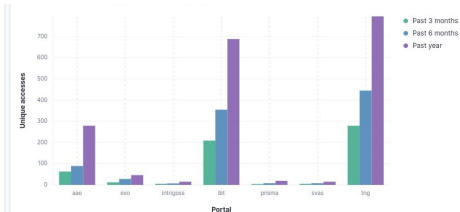
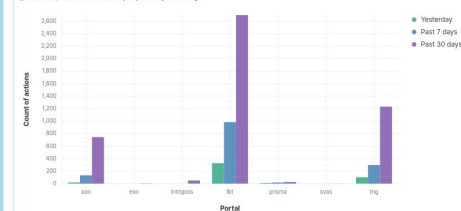
Nagios®

Portals unique accesses and activities

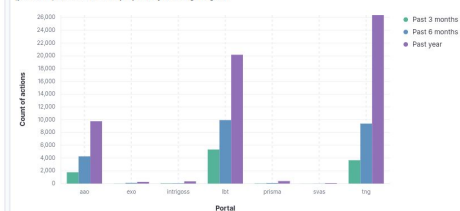
[Portals-all] Unique accesses per portal by time



[Portals-all] Successful actions per portal by time range



[Portals-all] Successful actions per portal by time range long term



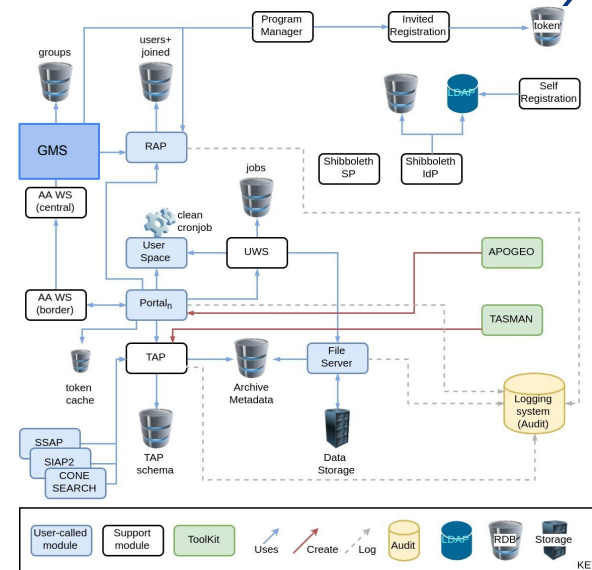
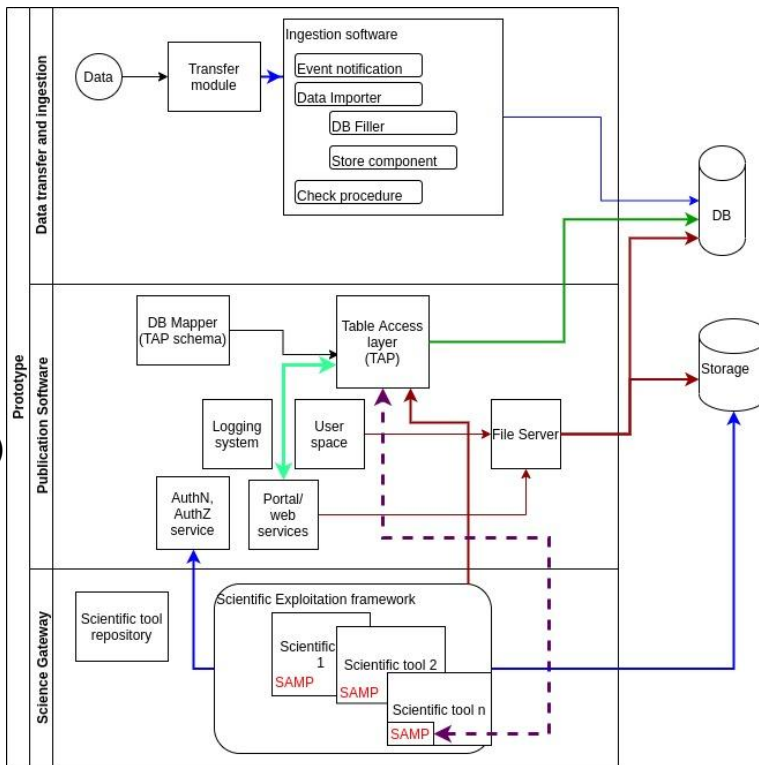
Infrastructure: SW

Developed Software:

NADIR
NEXT (RDI)
Nadir2PG
Web Portals
Archive Program Manager
Exposure Time Calculator
Proposal web tool
TAP lib
GMS service
SSO system (RAP + GMS)
File Service
APOGEO
TASMAN
VOSSIA

and

VOSpace





The INAF VOSpace implementation

<https://drive.google.com/file/d/1BqYOqImdH5J6LOqO81suomOf-dZv1vou/view>

Infrastructure: SW



VOSpace next feature will be:

- **DOI integration.** It will allow users to request for a dataset DOI without duplication of data (backup is anyway applied);
- direct **connection to computational clusters** (Pleiadi);
- **ssh** connection to VOSpace (moderated by admin) for big data storage (Carmelita use case);

IA2 next features:

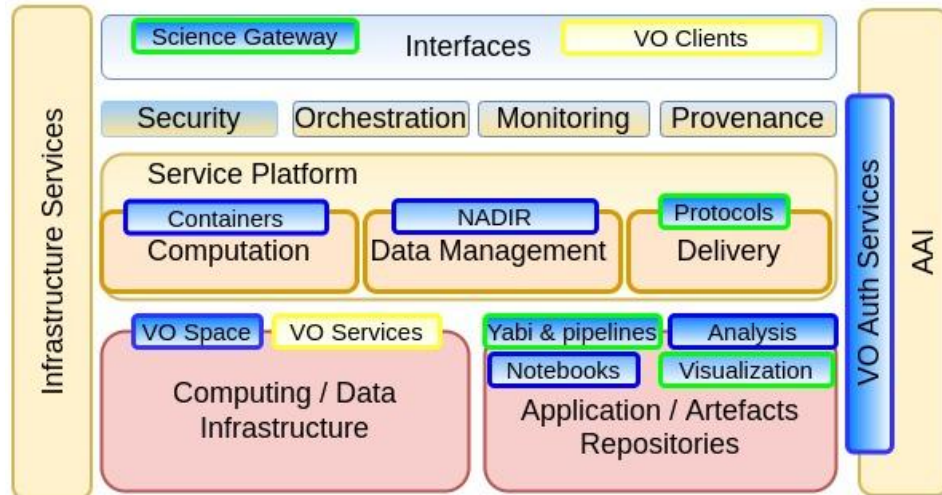
- **backup** (geographical distribution) and **integrity** checking strategies;
- git (in support to ICT)
 - **CD/CI** (already internally experimented)
 - availability of a **runner** machine (planned in the scope of ALMAGAL preliminary tests)
- ssh storage access using the IDEM credentials (no possibility to perform other actions)
- **vms/containerization** (in support to ICT)
 - availability of a limited number of VMs for projects that require a web portal or limited computational resources;
- **YABI** : more space for accessing pipelines
- Archive meta-description enrichment with **references to published papers.**

IA2 is ready to be part of a INAF Science Gateway

Infrastructure: SW



User Interface (GUI/CLI/API)



Several blocks are already in place, some others are under development.

All we need is ... a science gateway to collect them all!

Legend

Existing block

Partially existing block

Possible



Thanks!

Questions? Hints?

