Support for experiments at INFN-T1

C. Pellegrino - CHEP 23 - May 8th 2023

INFN CNAF

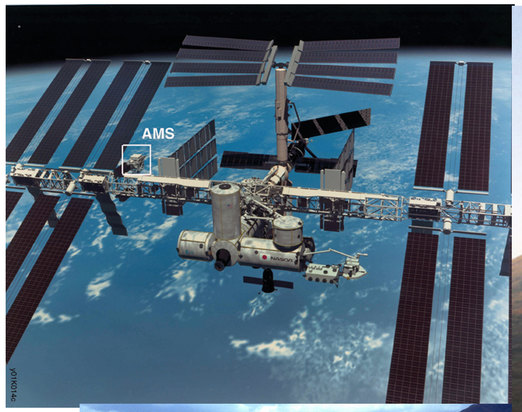
The Italian WLCG T1

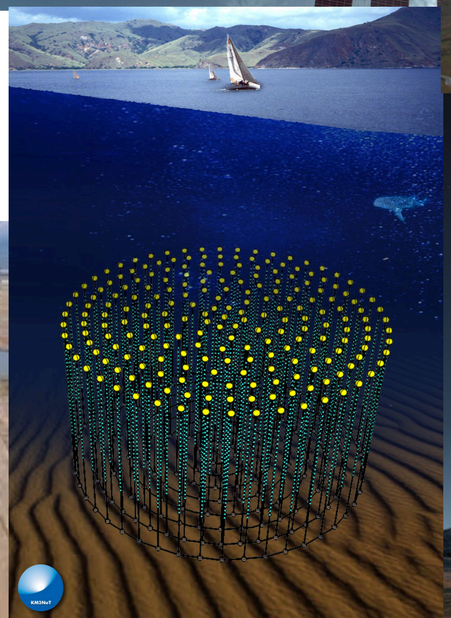
- The Italian WLCG Tier-1 is located in **Bologna** (**Emilia Romagna**)
  - managed by **INFN-CNAF** (https://www.cnaf.infn.it/)
- **~2.000 computing nodes** (physical and virtual machines)
  - **~60.000 core** managed by a batch system
- **~70 PB of disk**
- **~130 PB of tape** for long-term storage
- supports 60+ scientific communities
  - not only LHC and not only from the Physics field

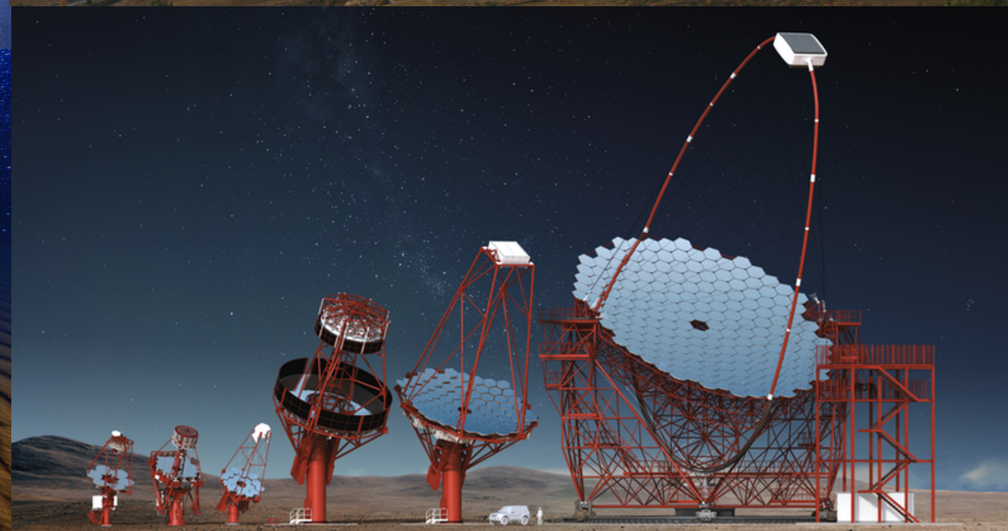
Not only WLCG

Other supported scientific communities

- High-Energy Physics: 8
- Astroparticle Physics: 18
- Gravitational Waves: 2
- Nuclear Physics: 15
- Dark Matter: 6
- others: 10

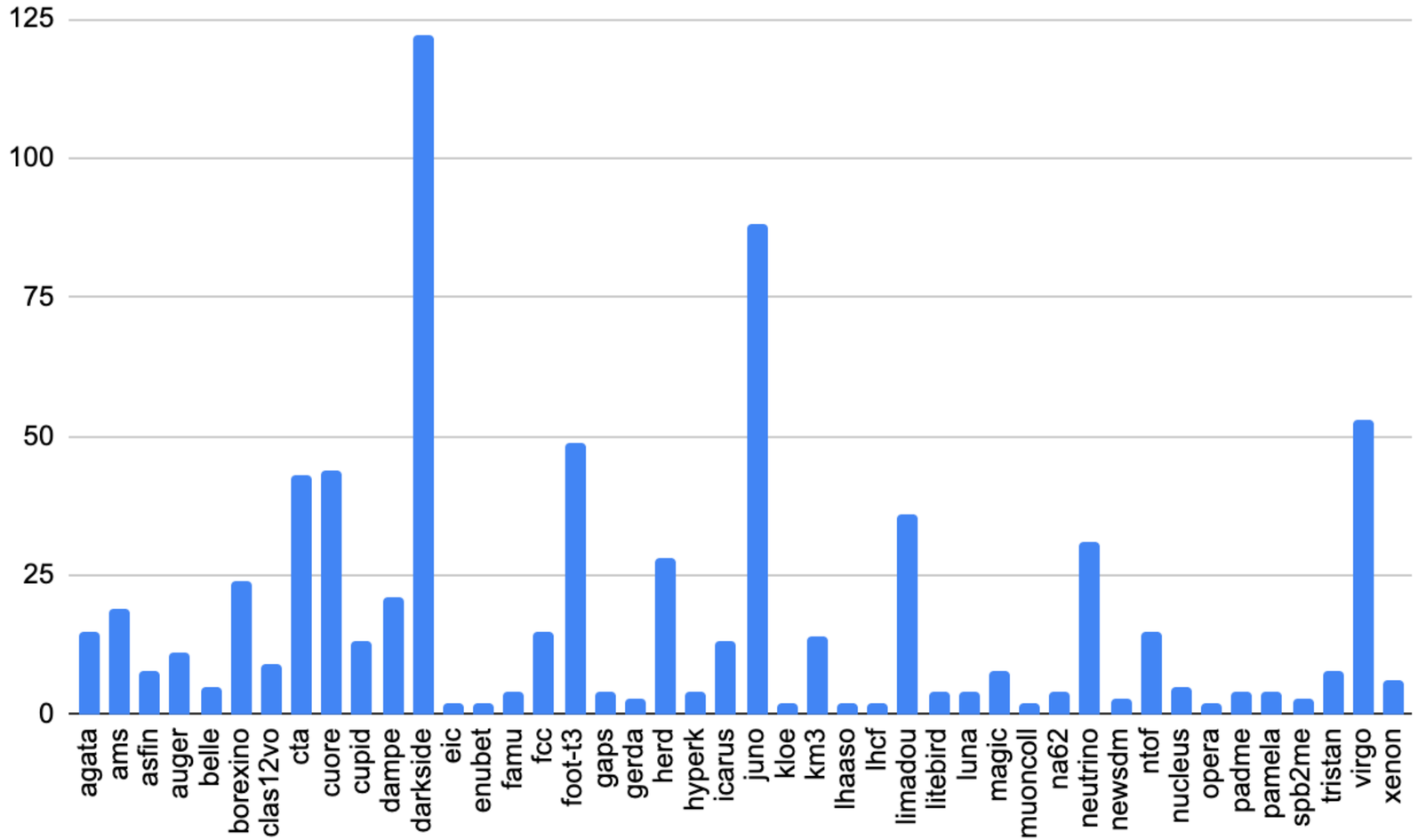






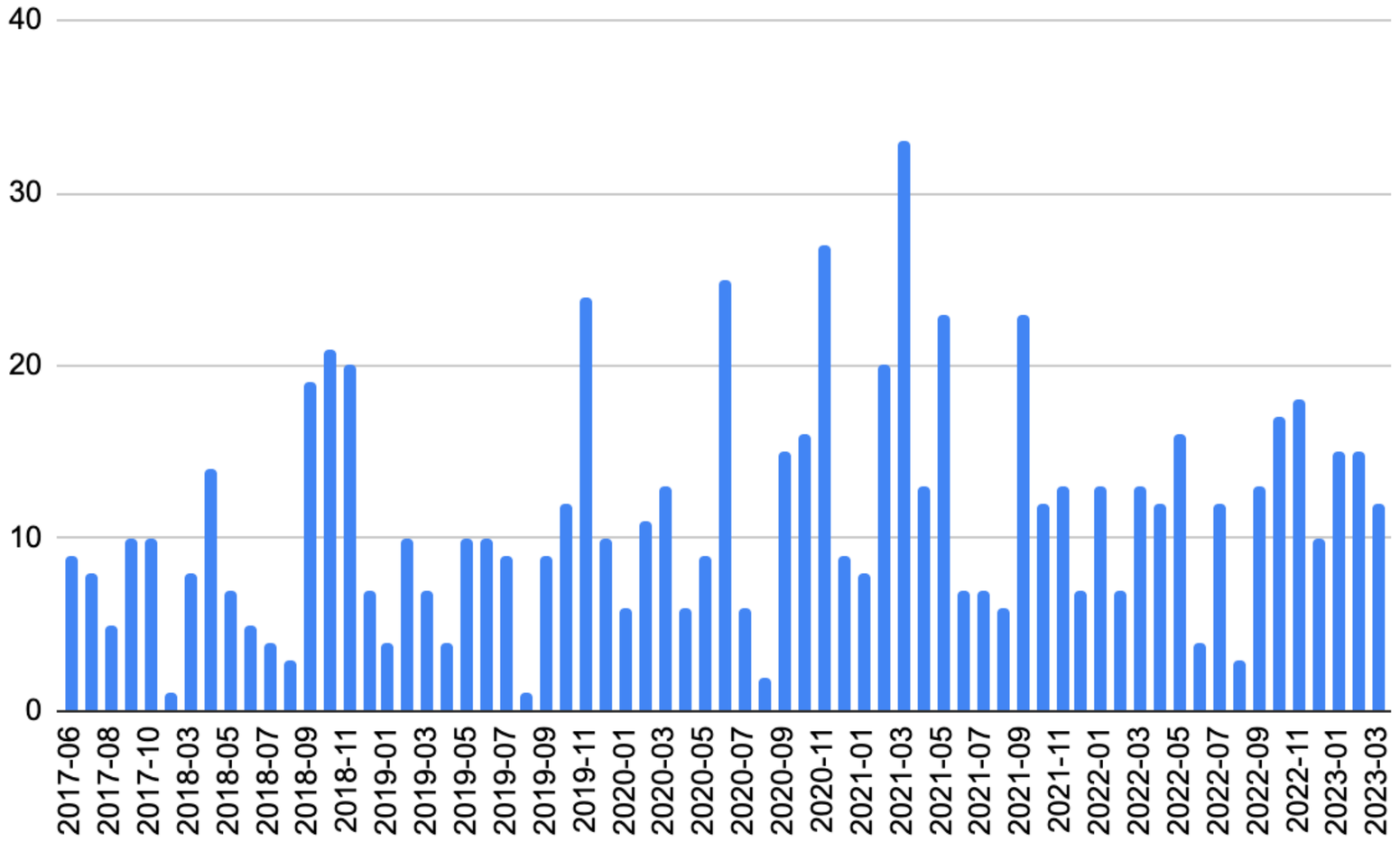
Local users per experiment

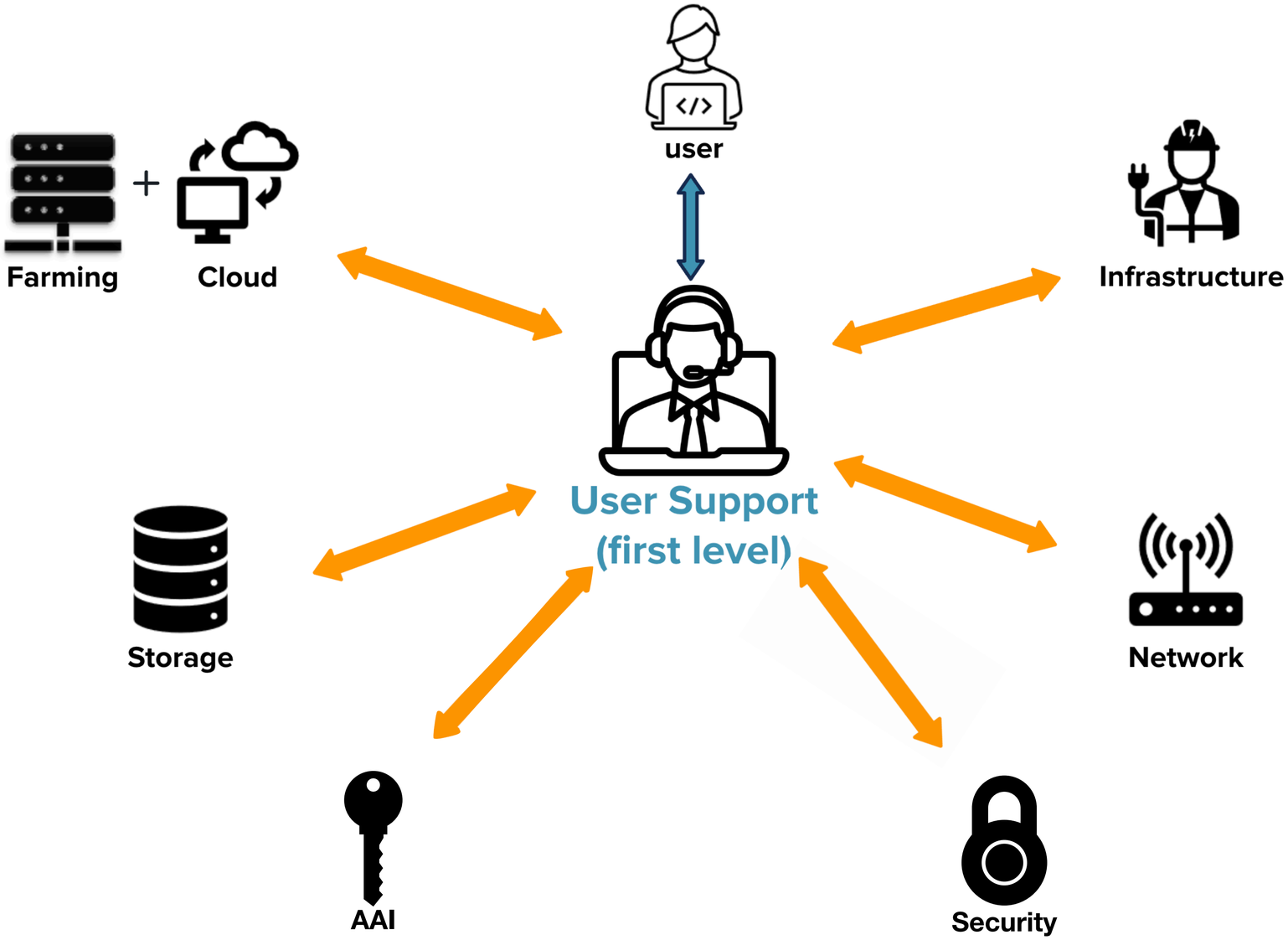
Since June 2017



Local registrations per month

Since June 2017




user
Farming
Cloud
Infrastructure
User Support
(first level)
Storage
Network
AAI
Security

The User Support unit

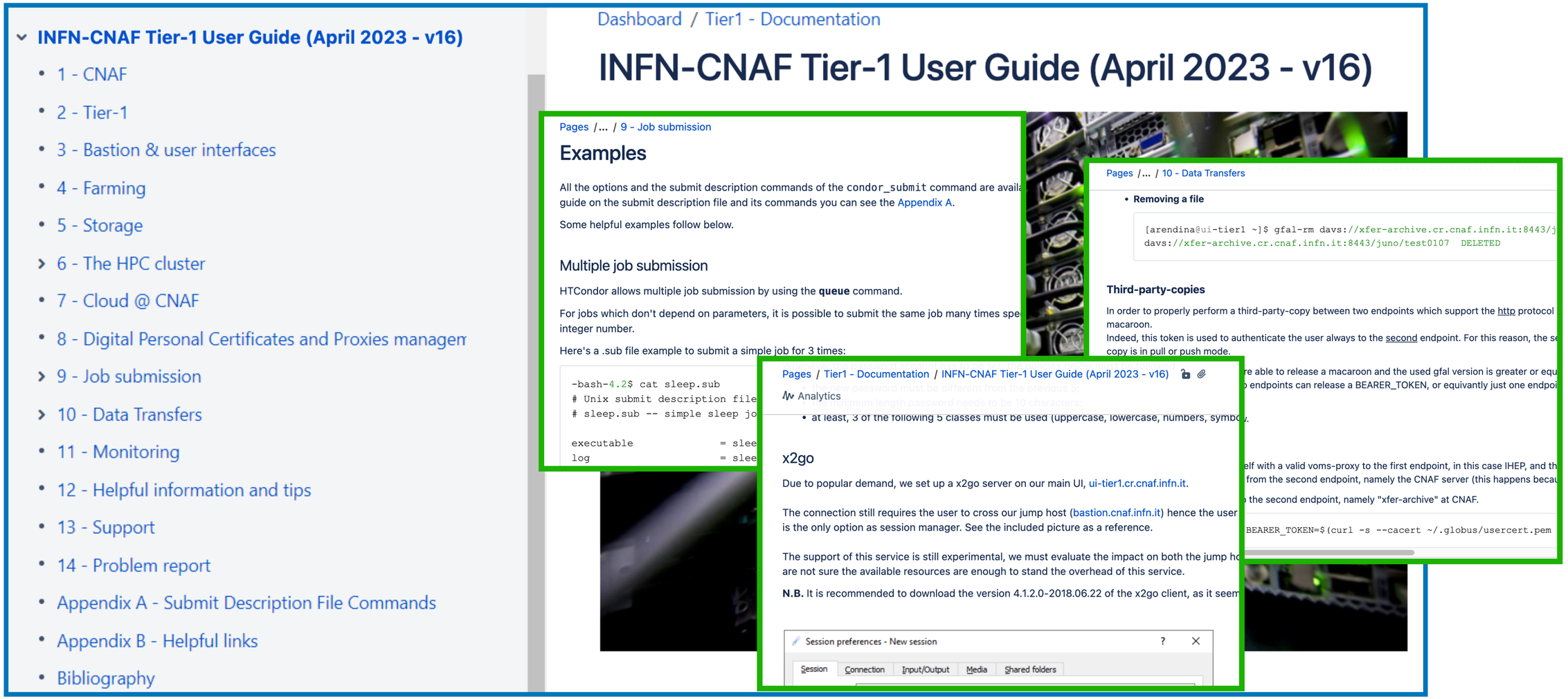
- Mission: solve most of the basic problems, and to write **documentation** to improve the usage of **solutions** and **standard tools** the Centre provides. Among them:
  - **HTCondor**, is the batch system for HTC, and **SLURM** for HPC
  - **gfal2-util**, is the tool for data transfer/management via Grid
  - **oidc-agent**, is the CLI tool to manage JWT tokens
  - **singularity/apptainer**, is the container solution
- Supporting the use of specific software:
  - personalised support on certain, specific, use cases. E.g.: user scripts, environment, etc...
  - different scientific communities need different software
- Composition: 6 people coming from different scientific fields

Support activities

- **On-boarding** of new **scientific communities** (projects, experiments, others)
- User **registration** procedure (recognition, authorisation, account creation)
- **Documentation** for users:
  - INFN-T1 **user guide** https://l.infn.it/t1guide
  - Automatically updated **useful pages** https://www.cnaf.infn.it/~usersupport/
- **Communication**:
  - Direct user communication (personal emails, chat)
  - Announces (mailing list, gocdb)
  - Periodic presentations (comitato di gestione (*CdG*), special events)
  - Dedicated meetings with experiments' people (on-boarding, special requests)

The INFN Tier-1 User Guide

https://l.infn.it/t1guide

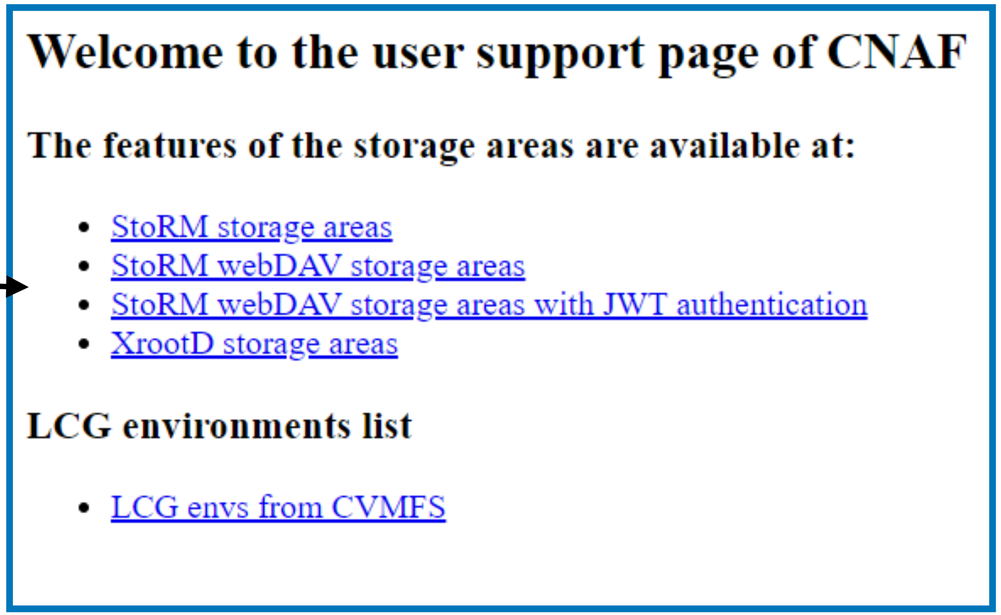


Handy links to useful pages 1/2

- Automatically updated useful pages every night
- To advertise specific information about the services available to the communities in a form that is easy to access and use:
  - https://www.cnaf.infn.it/~usersupport/

Storage Areas per service and experiment

LCG envs via CVMFS



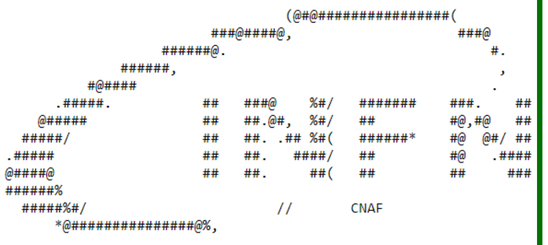
Handy links to useful pages 2/2

LCG Environments navigator

In the table below you find the updated list of LCG environments available through CVMFS.
Pick one of your choice from the list below, depending on the compiler version, root version etc..
and then run the following command on a user interface:

```
source /cvmfs/sft.cern.ch/lcg/views/<env>/<env_version>/setup.sh
```

env	env_version	compiler	root_version	python_version	python2_version	python3_version	cpp_version
LCG_97apython3_LHCB_4	x86_64-centos7-gcc9-opt	g++	6.22/04	2.7.16	2.7.16		cxx17
LCG_99	x86_64-ubuntu2004-gcc9-opt	c++	6.22/06	3.8.6		3.8.6	cxx17
LCG_99	x86_64-centos7-gcc8-opt	g++	6.22/06	3.8.6		3.8.6	cxx17
LCG_99	x86_64-centos7-gcc10-opt	g++	6.22/06	3.8.6		3.8.6	cxx17
LCG_99	x86_64-centos7-clang10-opt	clang++	6.22/06	3.8.6		3.8.6	cxx17
LCG_99	x86_64-centos8-gcc10-opt	g++	6.22/06	3.8.6		3.8.6	cxx17
LCG_99cuda	x86_64-centos7-gcc8-opt	g++	6.22/06	3.7.6		3.7.6	cxx17
LCG_geant4ext20210118	x86_64-centos8-gcc10-opt	g++	6.22/06	3.8.6		3.8.6	cxx17
LCG_geant4ext20210118	x86_64-centos7-gcc10-opt	g++	6.22/06	3.8.6		3.8.6	cxx17



StoRM WebDAV storage areas with JWT authentication

aa.wp6

StoRM WebDAV endpoint	Access point	Root path
xfer.cr.cnaf.infn.it	/DataCloud-TB	/storage/gpfs_escape/datacloud-tb

belle

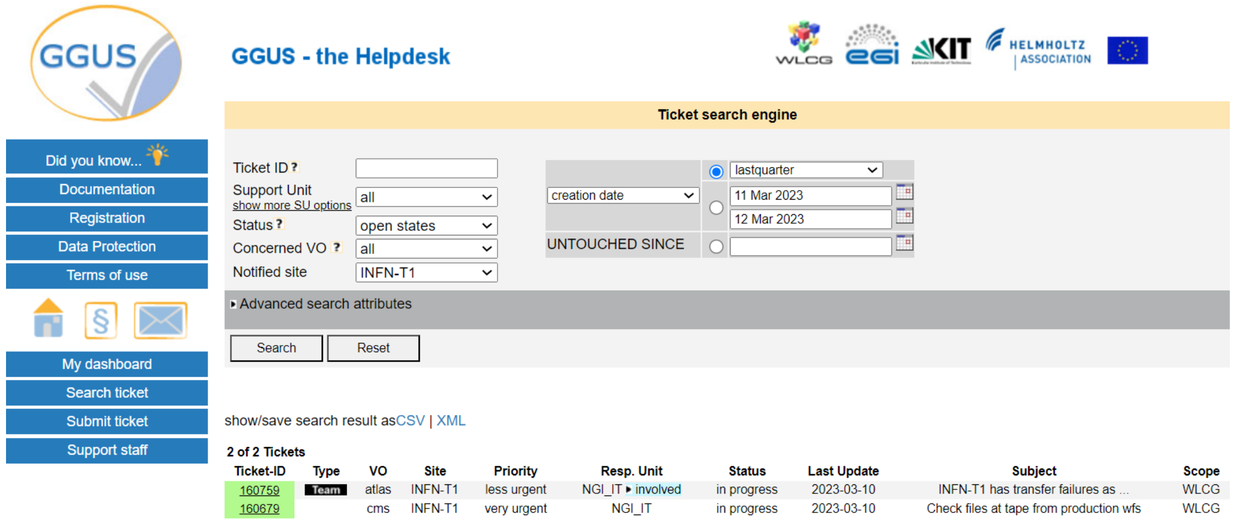
StoRM WebDAV endpoint	Access point	Root path
xfer-archive.cr.cnaf.infn.it	/belle	/storage/gpfs_data/belle

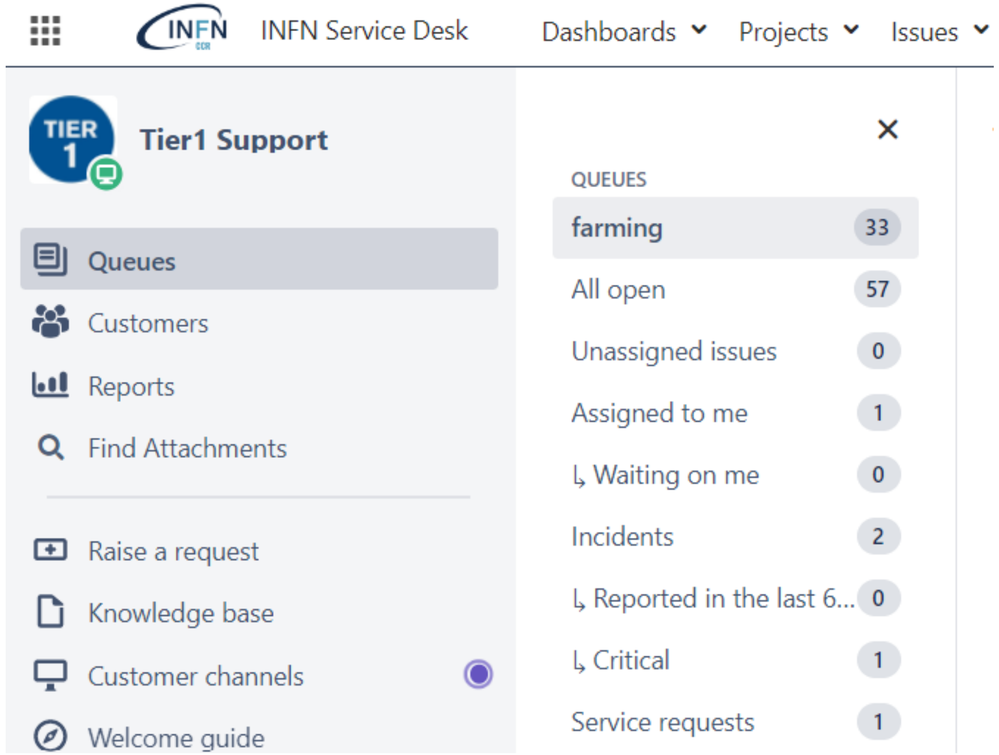
cta-lst

StoRM WebDAV endpoint	Access point	Root path
xfer-archive.cr.cnaf.infn.it	/cta-lst	/storage/gpfs_data/ctadisk/cta-lst

Communication channels

- Mailing lists to reach the users regarding the datacentre status
- Ticketing systems:
  - GGUS, mainly for WLCG VOs
  - Ticketing system for internals
  - Ticketing system for users (in development)





Typical issues

- **First level** support
  - disk quota exceeded
  - issues with batch jobs (not running, getting killed, etc…)
  - explanations/documentation requests
- **Second level** support (usually escalated to other CNAF teams)
  - installation of software
  - filesystem access management (SA configuration, POSIX permissions)
  - network problems
- Due to the overlap with other units, part of the second level support is also carried out in cooperation with the User Support team

Conclusions and perspectives

- Challenges for the User Support:
  - **keep its central role** between scientific communities and the INFN computing ones
  - support over multiple infrastructures => increase in workload driven by the DataCloud project (see poster 27 on Thursday)
    - an increasing adoption of automation techniques
    - getting more people involved to keep a sustainable personal effort
- Future plans:
  - **Harmonisation** of the INFN-Cloud and T1 **documentations**
  - Gain good visibility of on both **cloud** and **T1** usage.
- Fostering the creation of **a community of users** who provide **mutual support** on common computing topics

Thank you for your attention