



The CNRS logo, consisting of the letters "cnrs" in a white, lowercase, sans-serif font inside a dark blue circle.

CNRS Nucléaire & particules

CC-IN2P3 status report

FJPPN Workshop

KEK, Tsukuba, May 2026

- **Some (general) news from CC-IN2P3 Computing**

- new GPUs installed (2025)
- new Jupyter platform

- **Storage**

- new tape library

- **Facilities**

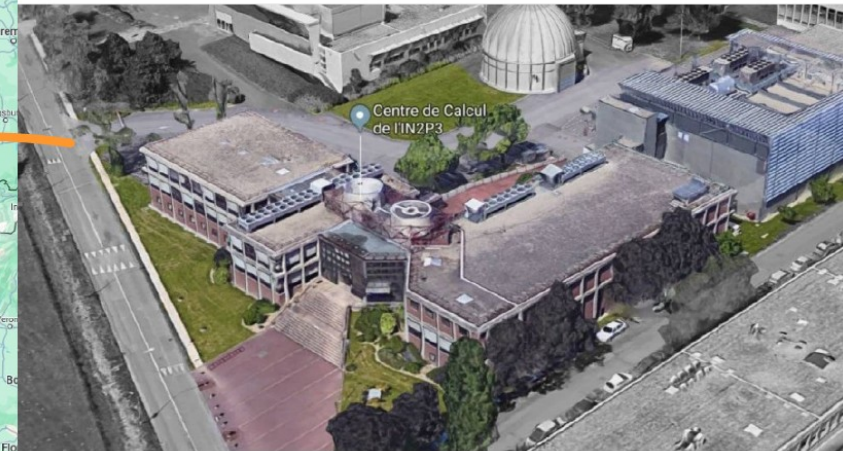
- new computing room (2025)

- **User & collaborative services**

- **Conclusion & perspectives**



Located in Lyon (Villeurbanne)



IN2P3 Computing Center overview



- **Resources**

- 79 people (75 engineers – 63 IT, 3 people in the research team and 1 trainee)
- Budget 2025: 7.1 M€ (HR excluded)
 - 2.5 M€ buildings (incl. 1.7 M€ for electricity)
 - 4 M€ computing (incl. 2 for WLCG) & 0.4 M€ running costs
- Budget 2026: should be ~7.1 M€ (got lucky, no cut)

- **Facilities**

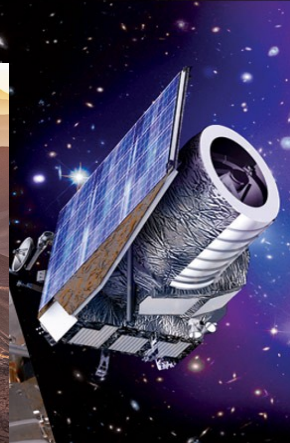
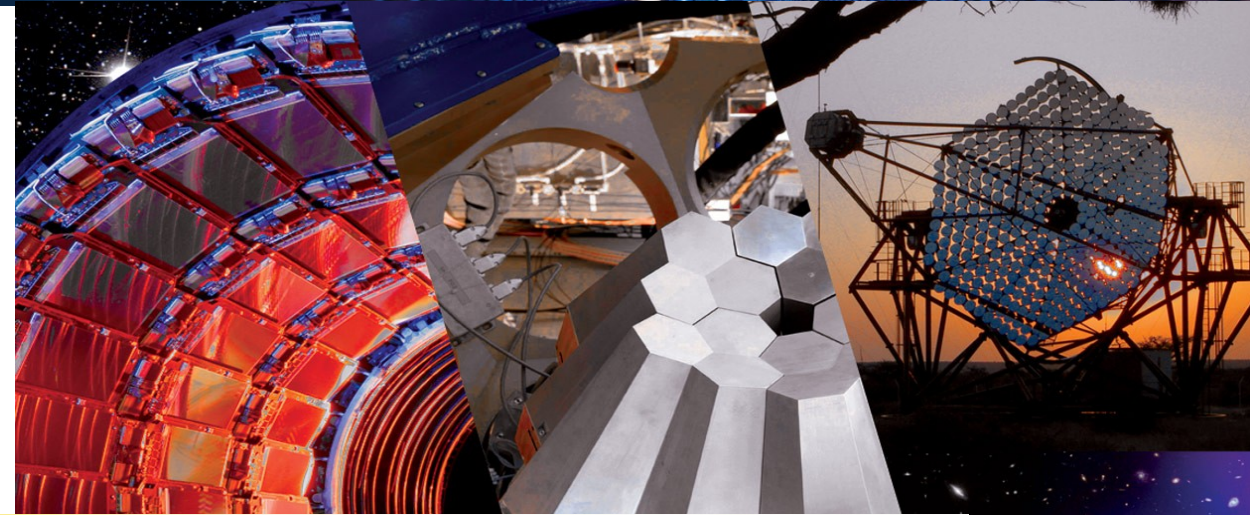
- 1700 m² over two computing rooms
- New room Vil3 just built (delivered in December 2025)

- **Computing**

- ~800 servers
- 1200 kHS23
- 4 ARM workers (mostly test)

- **Storage**

- Tapes: 570 PB (full capacity, including the new library installed in November 2025)
- HDDs: ~100 PB



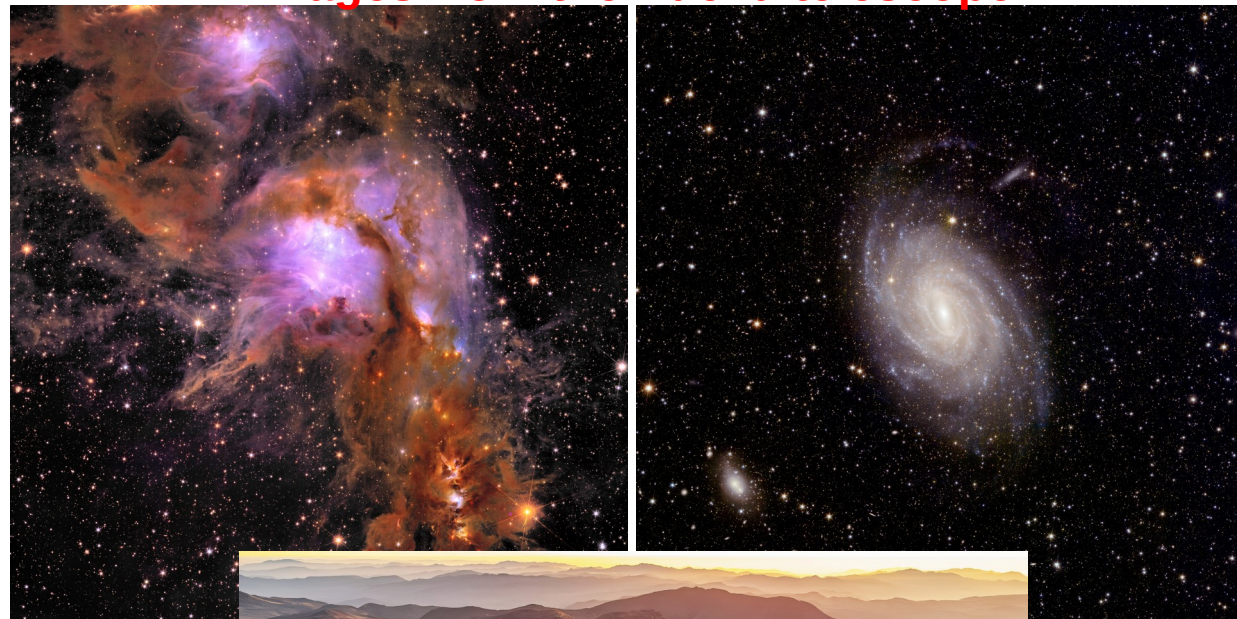
IN2P3 Computing Center overview



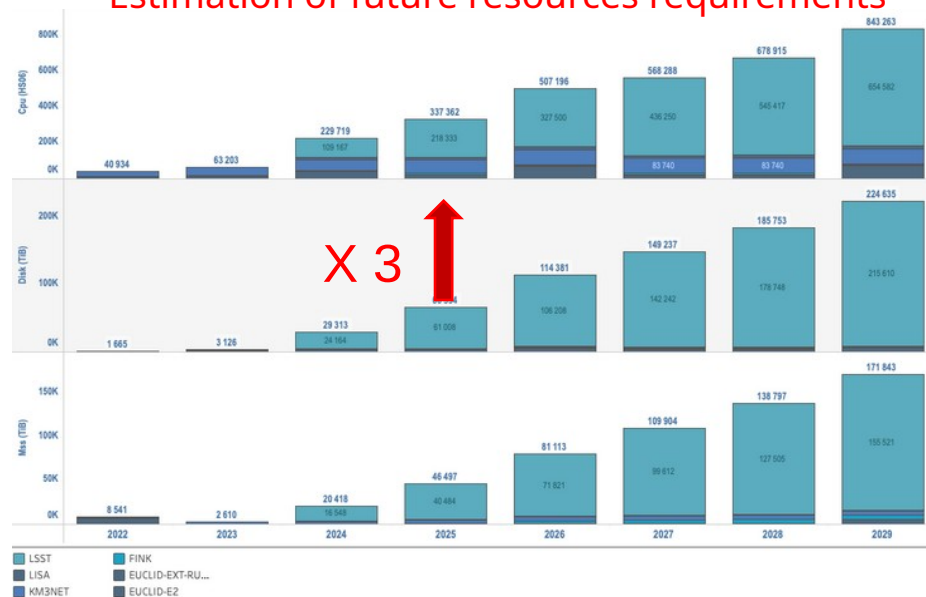
More than 100 scientific collaborations

- LHC is our biggest user with **70%** of the total (CPU) resources used
 - Tier-1** for the 4 LHC VOs (provides 10% of the total Tier-1s resources)
- CC-IN2P3 also supports more than 40 cosmology and astroparticle experiments, which use **20% of CPU resources (and 30% of GPU)**
 - will store and process 35% of all Vera-Rubin's (LSST) images, and 25% of Euclid ones

Images from the Euclid telescope



Estimation of future resources requirements

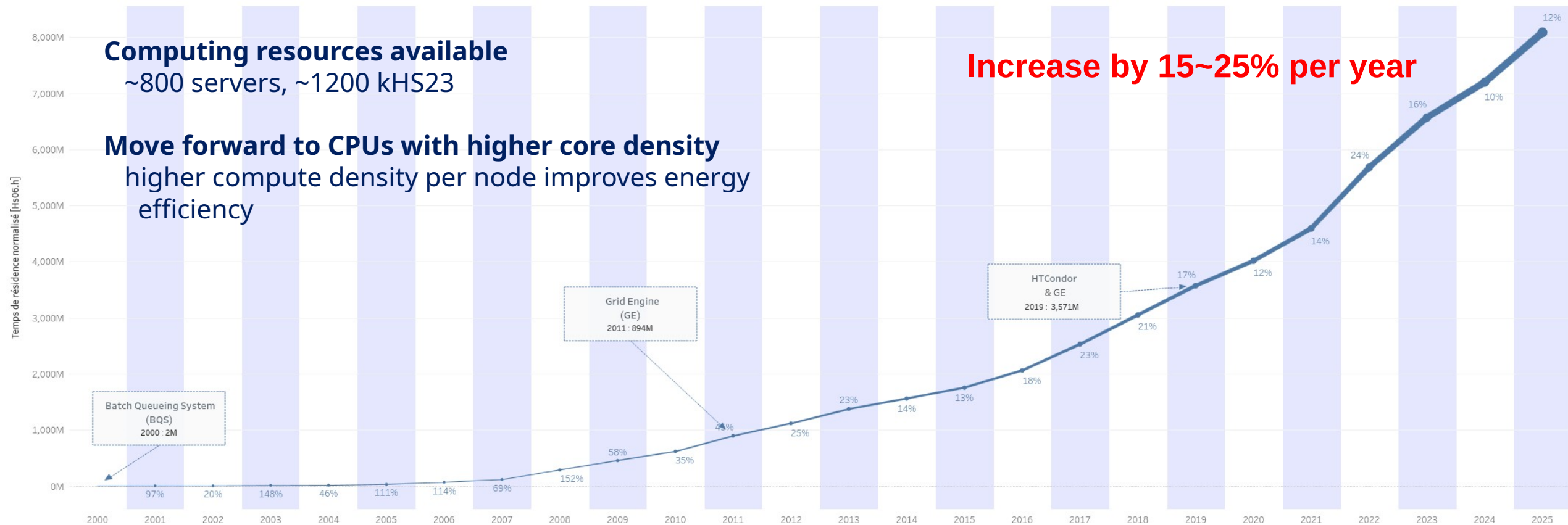


As of 2029,
CPU ~900 KHS23
(compare to now,
1200 KHS23)

Computing & Batch Systems

Walltime increase over the years

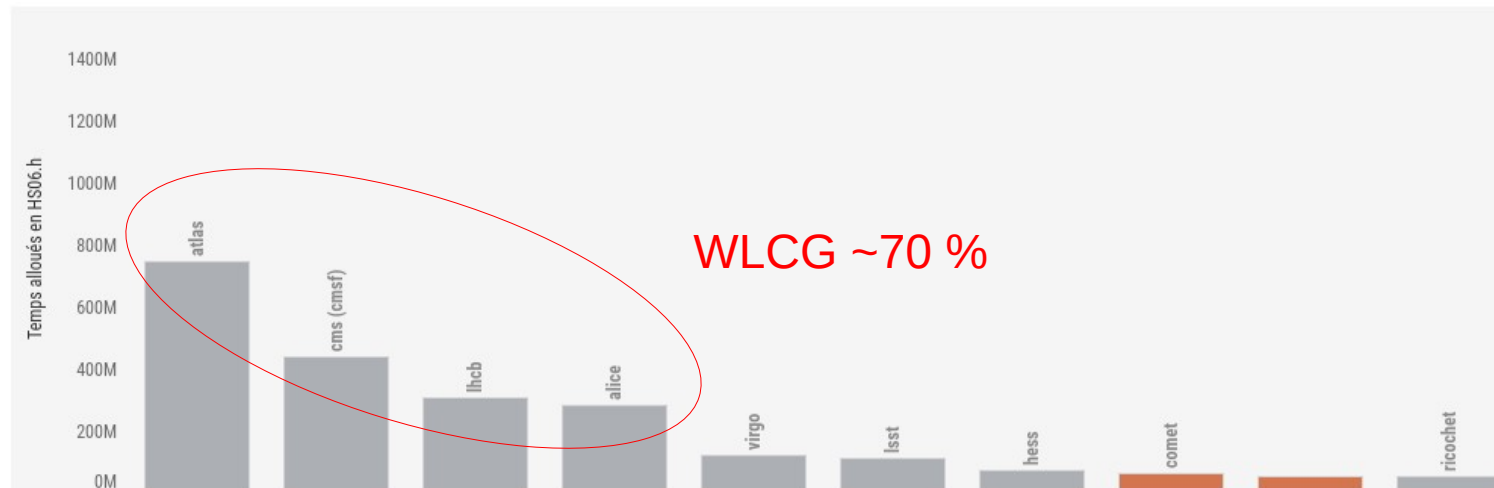
Evolution du Calcul au CC-IN2P3 depuis 2000



2 computing farms

- **HTCondor**
 - batch system for all grid experiments (mostly LHC and BelleII)
 - 75% of the CPU resources provided through Condor
- **Slurm**
 - For 'local' users (french scientists) and other groups
 - provides HPC and GPU resources

10 largest CPU-consuming groups (2026)



New GPUs installed in 2025



- **New GPUs installed in the JupyterLab (platform) and in Slurm in 2025**
 - provided (and bought) by Huma-Num (Humanities and Social sciences)

- **In Slurm**

- V100 (already installed)
 - PowerEdge C4140
 - 18 workers, **72 GPUs (32GB per GPU) with 192GB memory per worker**

- **H100 NVL (installed in Spring 2025)**

NEW!!

- ProLiant DL385 Gen11
- 4 workers, **16 GPUs (94GB per GPU) with 1,5TB of memory per worker**

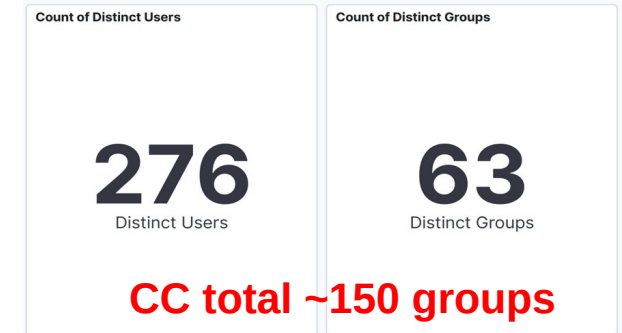
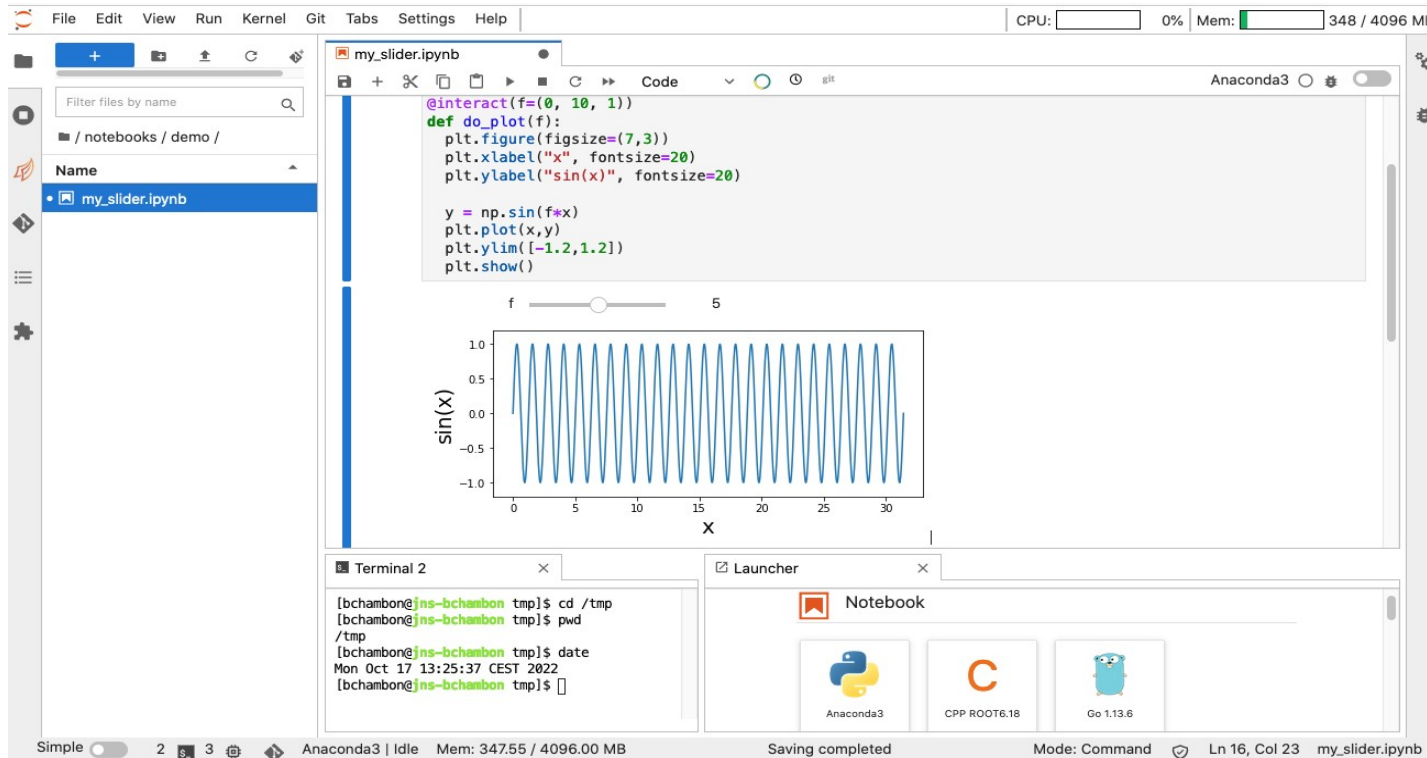
- **In JupyterLab**

- **L40S (installed in Spring 2025)**

NEW!!

- ProLiant DL385 Gen11
- 8 workers, **30 GPUs (48GB per GPU) with 768GB of memory per worker**

Computing : Jupyter notebooks



Platform often used/reserved for trainings

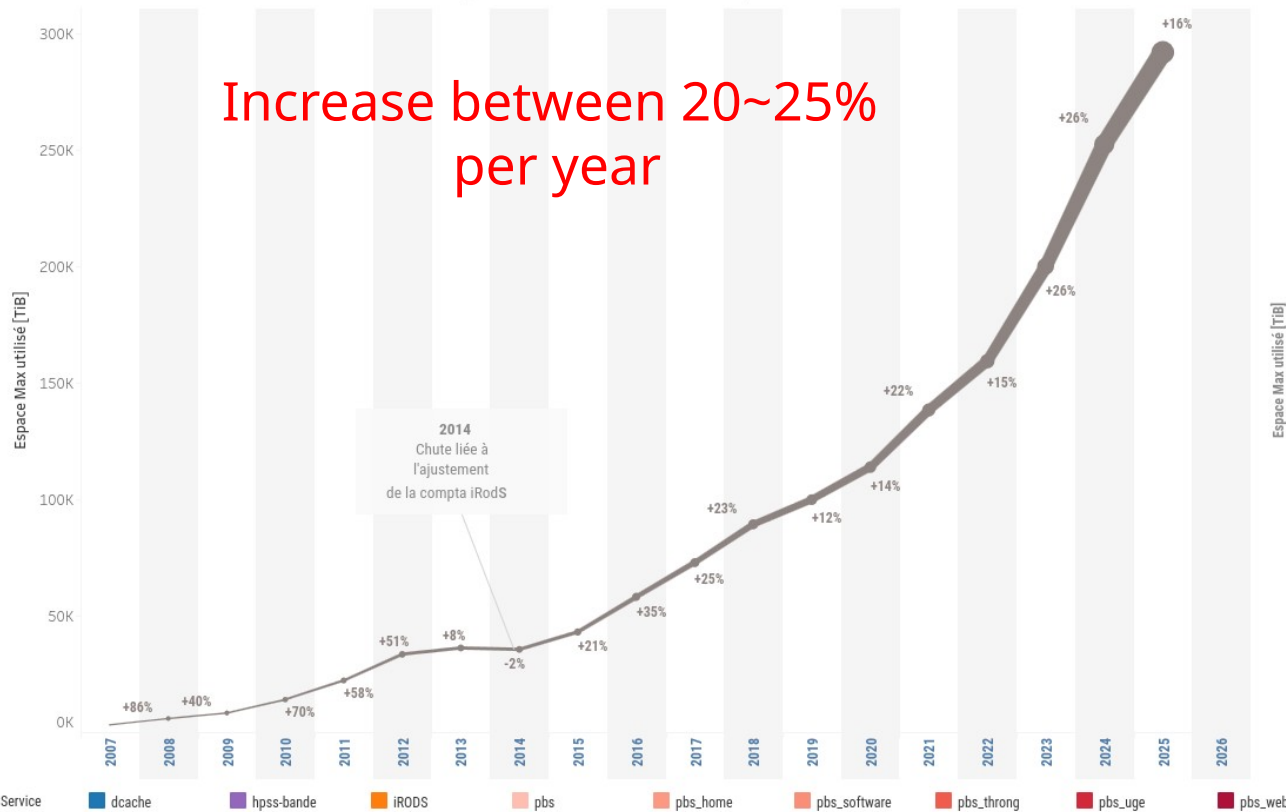
- 5~6 trainings per year (few days to a week long)
- using mostly GPUs

- provides various programming languages and (JupyterLab's) extensions to extend the features of the service
- provides Nvidia L40S GPUs (30 GPUs installed in Spring 2025)
- A new Jupyter notebooks platform is being developed, based and run directly on Slurm, will allow a better resources management and accounting provide exactly the same computing environment as Slurm

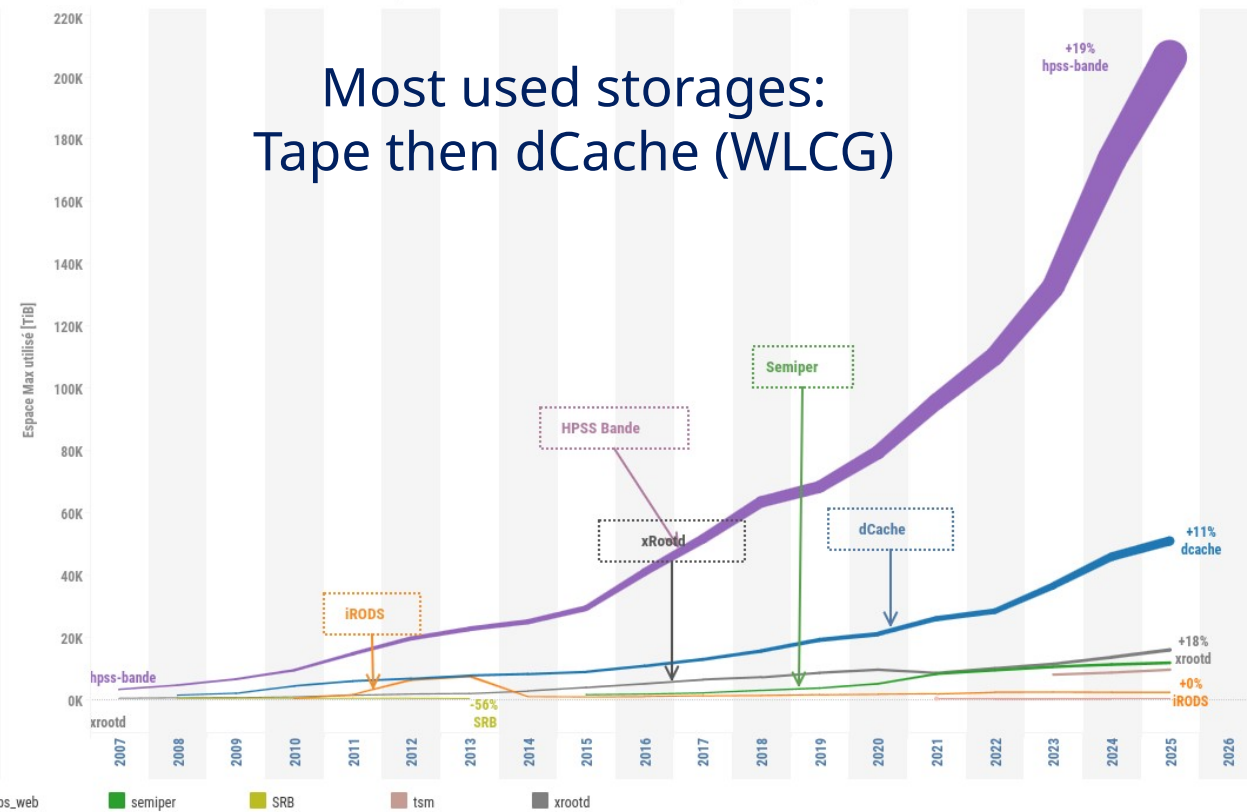
Storage Resources

Increase of the storage usage and split between main backends provided

Evolution du stockage Total utilisé
-Espace mensuel maximum utilisé sur la période-



Détail du stockage utilisé par Service
-Espace mensuel maximum utilisé sur la période pour chaque Service-



Distributed filesystems

- Isilon NAS (GROUP directories, data) being phased out as distributed FS over compute nodes, replaced by CephFS
 - Currently 2 clusters of CephFS in production : 2 x 5 PB
- Isilon NAS still used for HOME directories
 - snapshots feature
 - higher level of data security (erasure coding or replication)

Tape management

- Two Spectra TFinity libraries currently in production
 - 2 x 48 IBM TS1160 tape drives
 - full capacity: 2 x 135 = 270 PB
 - current usage **~237 PB**
- New IBM TS4500 (installed in December 2025)
 - 48 LTO10 tape drives
 - full capacity: 300 PB
 - 1200 tapes (12% of full capacity)
- HPE Storever MSL 3040
 - 14 LTO9 tape drives
 - full capacity: 10 PB
 - backup for IN2P3 labs (and various CNRS groups)



Storage overview

Old Oracle library replaced by IBM TS4500 on December (increased the full capacity to 570 PB)

Full capacity 2 x 135 PB

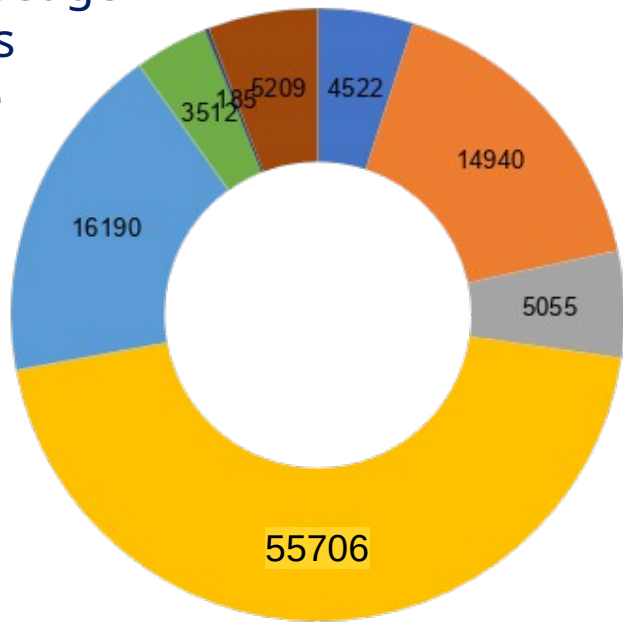
Full capacity 300 PB



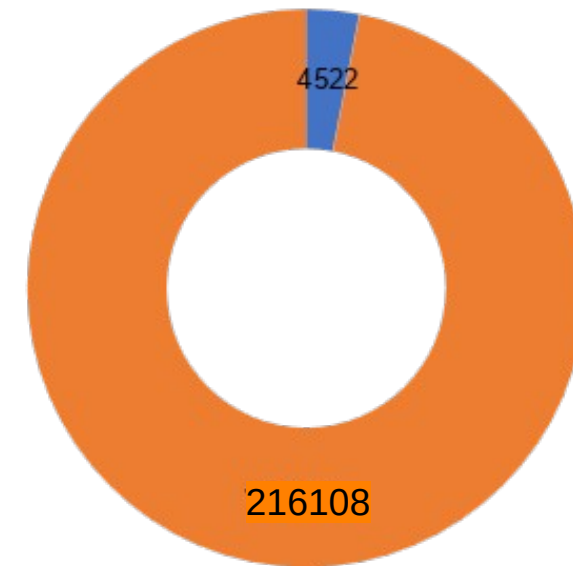
Disk Size Distribution (TiB)

Current storage usage

- ~100 PB disks
- ~237 PB tape



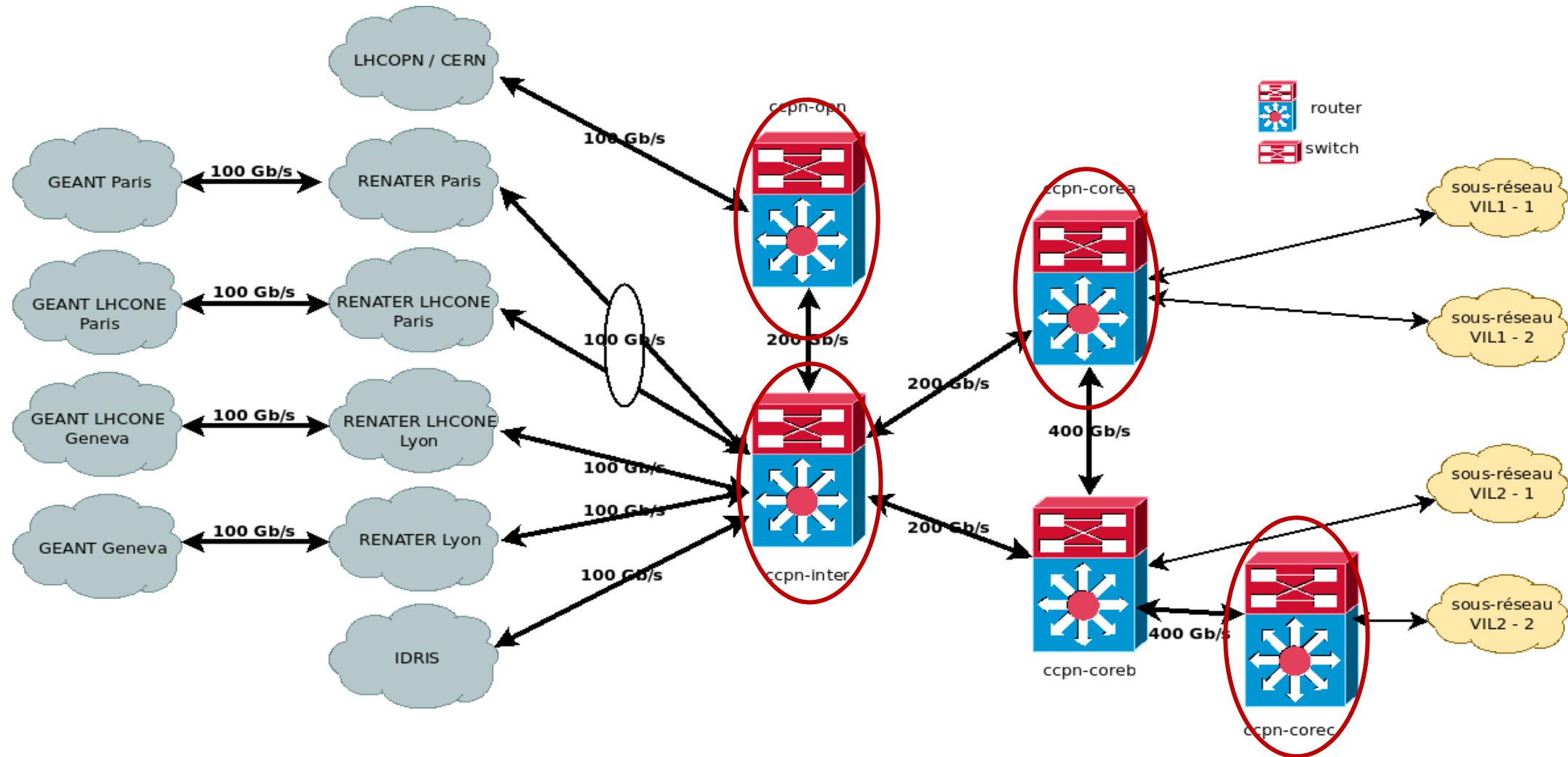
Tape Size Distribution (TiB)



LHC ~ 160 PiB

Networking

Current network infrastructure... but the network backbone is planned to be upgraded / replaced.



Current network infrastructure... but the network backbone is planned to be upgraded / replaced.

The links of the backbone routers will be upgraded from 100Gb/s to 400 Gb/s

- routers 'ccpn-inter', 'ccpn-corea', 'ccpn-corec' and 'ccpn-opn' will be replaced (will still use Cisco hardware)
- 'ccpn-coreb' will disappear

New router for the new computing room Vil3 (400Gb/s)

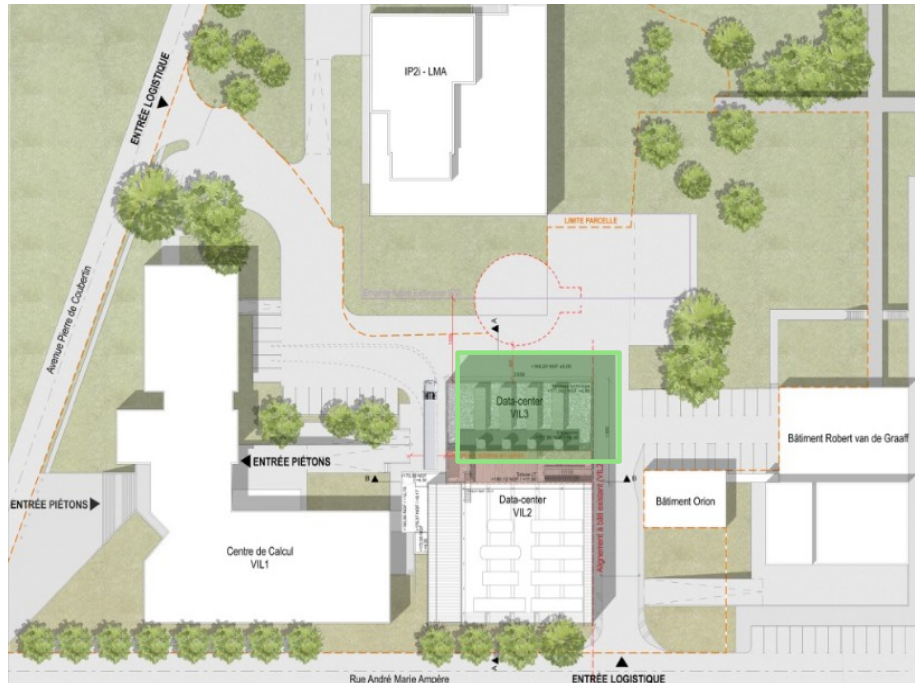
Upgrade planned for 2026.

Facilities

New Computing Room vil3

New room partly funded through FITS Equipex (national project with IDRIS, national HPC)

- Target usage: research infrastructure hosting
 - will allow to move remaining IT services from Vil1 to Vil3
- Construction completed on December 25
- 2MW IT at term (130 racks, 15KW), PUE ~1.3 (full occupancy)
 - slightly smaller than Vil2 (3.2 MW IT, ~240 racks, PUE ~1.4)
- ~9 M€ without IT



Photovoltaic installation on the roof

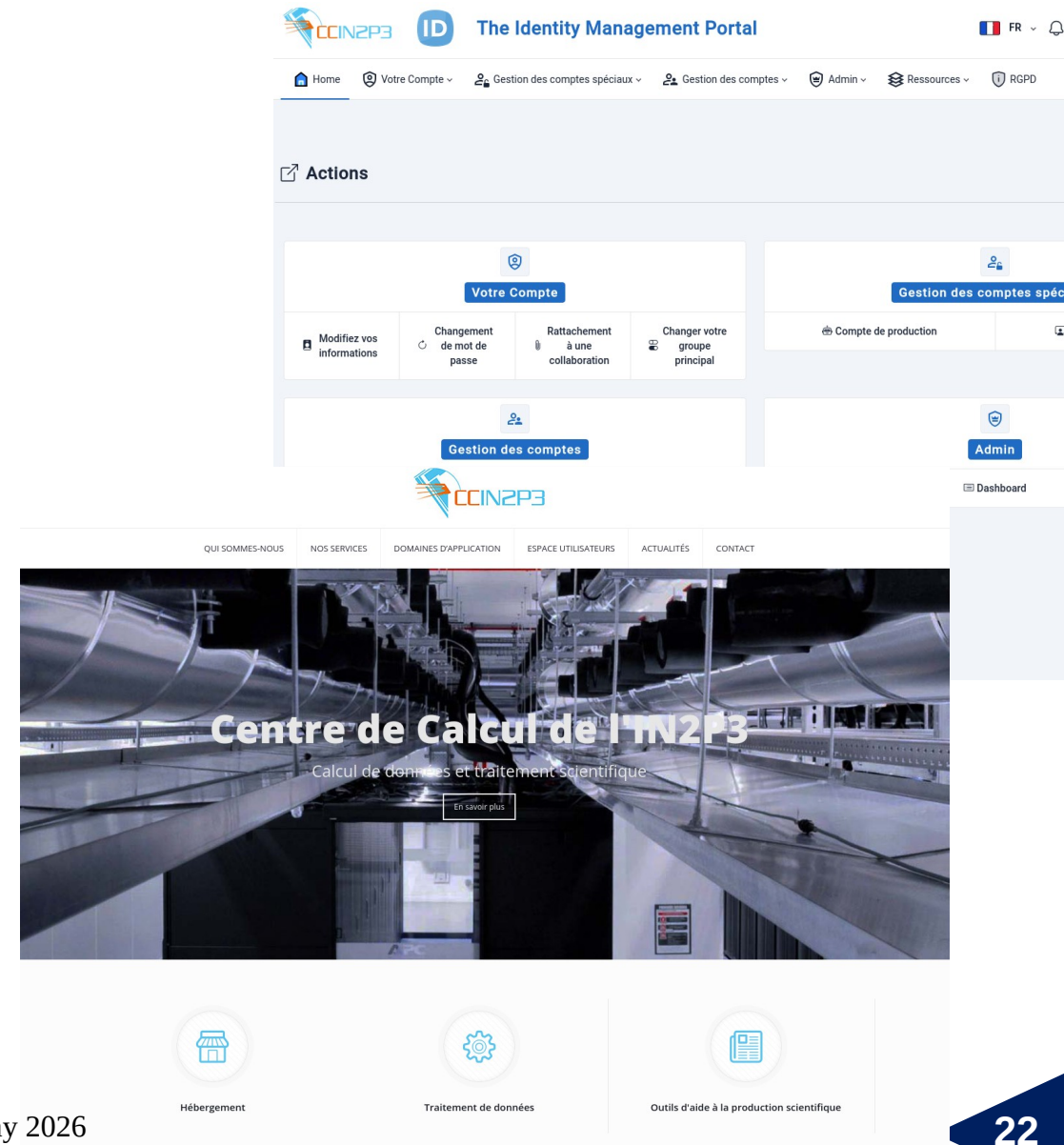
Photovoltaic installation

- 680 m² on the roofs
- 141 kW peak
- 150 MWh annual production
(to compare with 12.7 GWh overall consumption)
- ~150 k€ pre-tax budget
- ~21 k€ savings / year



User & collaborative services

- **New Identity portal (authorization & authentication) being developed**
 - allow users to fully manage their account and their groups
 - will improve the automation of most procedures
- **OpenStack (cloud) platform (Platform-As-A-Service)**
 - allow users to setup virtual machines according to their needs
 - users are free to install any software they need
 - currently running more than 720 VMs, more than 1 PB of available storage
- **Kubernetes (Red Hat OpenShift) platform for websites hosting**
 - CC-IN2P3 can provide WordPress based sites and hosts them
 - ~120 sites for and managed by CC-IN2P3
 - ~180 sites for collaborations (and hosted by CC-IN2P3)



The image shows two screenshots. The top one is a screenshot of the 'The Identity Management Portal' for CCIN2P3. It features a navigation menu with 'Home', 'Votre Compte', 'Gestion des comptes spéciaux', 'Gestion des comptes', 'Admin', 'Ressources', and 'RGPD'. The main content area is titled 'Actions' and contains several cards for account management: 'Modifiez vos informations', 'Changement de mot de passe', 'Rattachement à une collaboration', 'Changer votre groupe principal', 'Gestion des comptes spéciaux', and 'Compte de production'. There are also buttons for 'Gestion des comptes' and 'Admin'. The bottom screenshot is a website for the 'Centre de Calcul de l'IN2P3', featuring a large image of a data center and the text 'Calcul de données et traitement scientifique'. Below the image are three icons representing services: 'Hébergement', 'Traitement de données', and 'Outils d'aide à la production scientifique'.

CAD Computer Aided Design

provide 3D Experience (Dassault Systems)



Elias

ElasticSearch On Demand service with a Grafana frontend for data visualisation



GitLab

~16k users (~4k active users)
~500 TiB of storage available
CI/CD (public runners available)



Instance overview

Projects 31,671

New project

Total Users 16,873

New user

Groups 4,184

New group

Various collaborative services provided to the IN2P3 labs

- Indico
- Zimbra
- IN2P3 Box (NextCloud with OnlyOffice)
- IN2P3 Forge (Redmine) for projects management
- Atrium (Nuxeo based, with laptop clients) for documents management



Conclusion & Perspectives



- **Hardware price are increasing (a lot)**
 - memory by ~50%
 - Nvidia GPU by a factor of ~3 !
- **Hopefully WLCG hardware renewal completed**
 - purchases completed by the end of 2025 (before the price increases)
- **Other 2026 experiment requests (CPU, GPU, storage) just purchased**
 - LSST upgrade cost twice more than if bought in end of 2025
- **Tape storage usage increasing, currently ~237 PB (full capacity 270 PB)**
 - New tape system (IBM TS4500) purchased, increasing the total capacity by 300 PB
- **Main perspectives for 2026**
 - Re-order all IT services between Vil1, Vil2 and Vil3.
 - Major network upgrade (main routers to be upgraded)

ごせいちょうありがとうございました。ごしつもんはありますか？

Thank you ! Questions ?