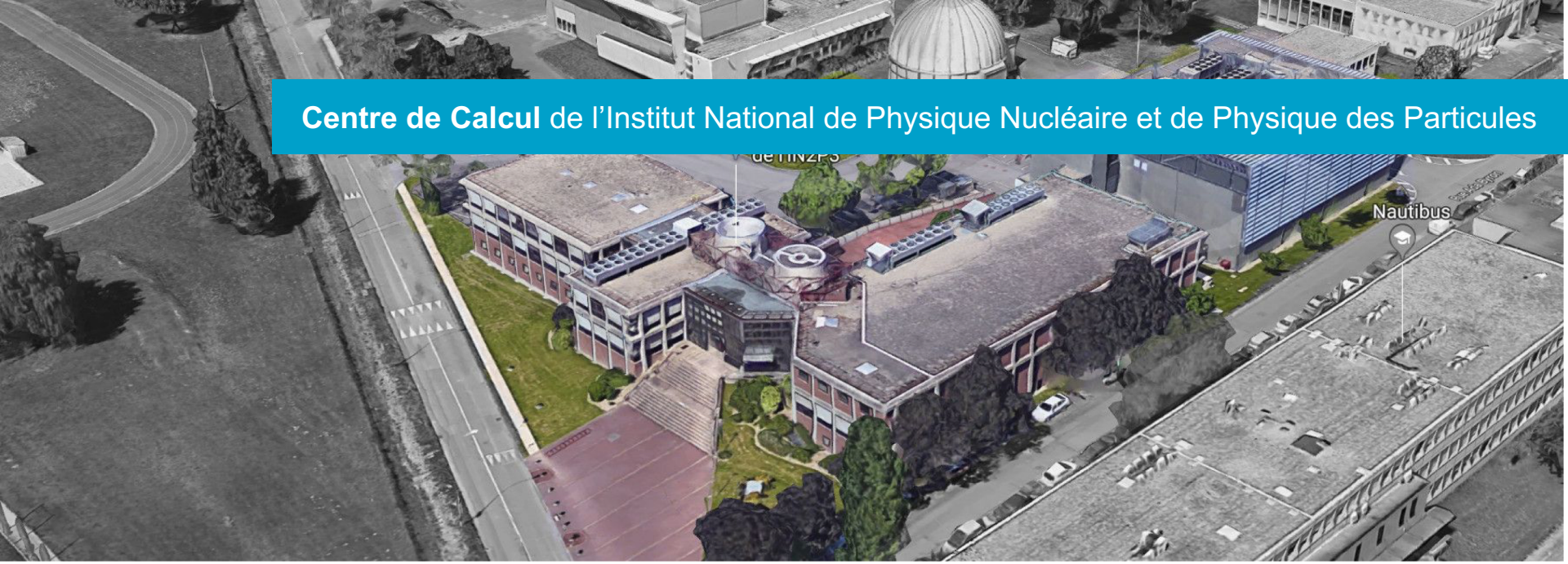


Centre de Calcul de l'Institut National de Physique Nucléaire et de Physique des Particules

CC-IN2P3 Computing Centre

Ghita Rahal

Support for sciences communities

HEP
Nuclear Physics
Multidisciplinary

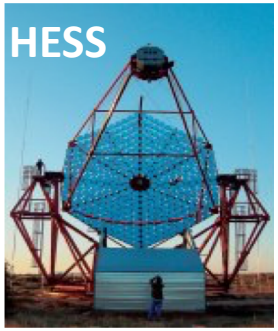
All data storage and processing resources

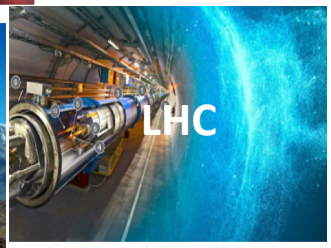
Collaborative services

Directory, mail, gitlab

Network access Hub

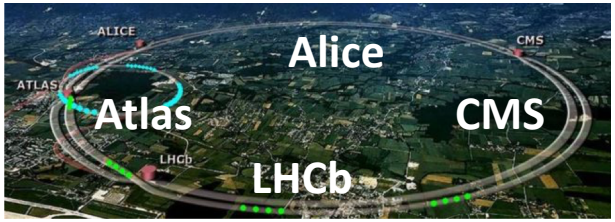
RENATER
Last mile

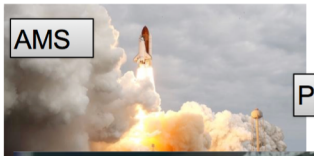


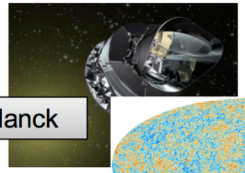


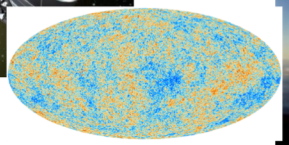
Research Community

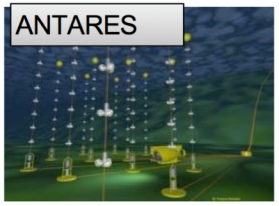
- Working for >80 experiments
- Tier1 for WLCG: Alice, Atlas, CMS, LHCb
- Futures big experiments in astroparticle physics
- Raw Tier for BELLEII









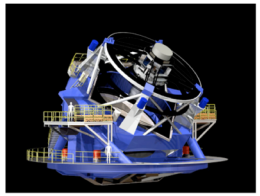


LSST

Whole dataset available at CC-IN2P3

50% of the processing by CC-IN2P3

other 50% by NCSA



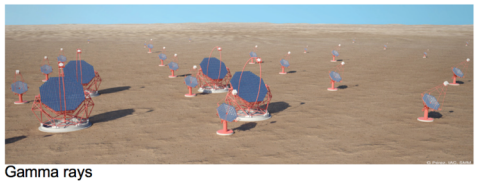
EUCLID

CC-IN2P3 is the French Data Center for processsing and data management

dark energy and dark matter

CTA

CC-IN2P3 should play a key role in the CTA data processing



Gamma rays

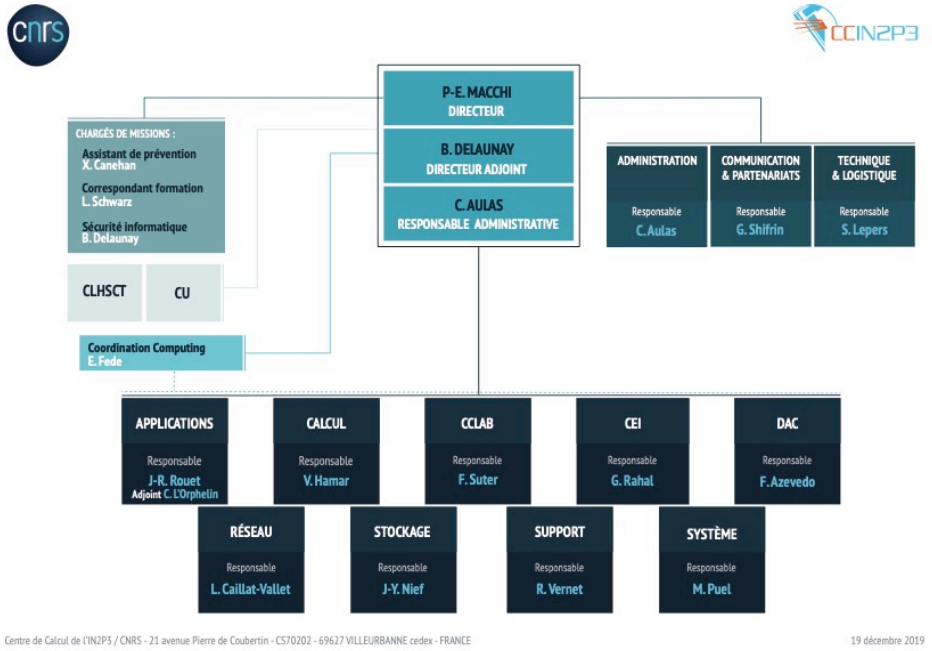
CC-IN2P3 Organisation

Resources

80 agents (65 IT engineers)
budget ~7-8M€

Facilities

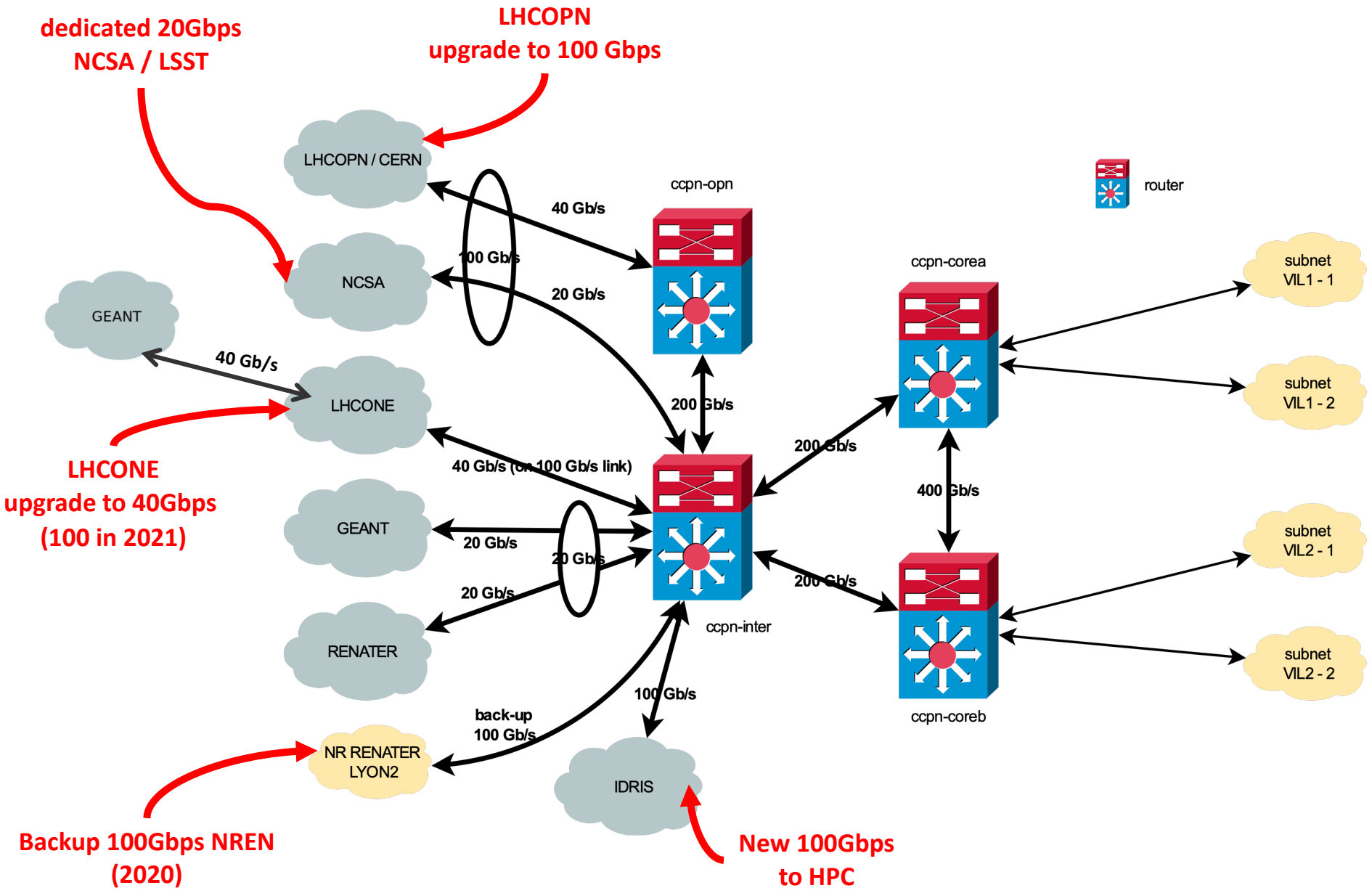
- 1700 m² over two computing rooms
- Operation: 24/7/365
- VIL1 (oldest) hosts mass storage and critical services.
- VIL2 (newest) hosts computing resources and disk storage systems.
- RENATER regional point of presence in VIL1
- Both rooms connected with a 400Gbps link.



Modified in Sept 2019

Visit of DataCentre scheduled @12:15

Network deployment and evolution



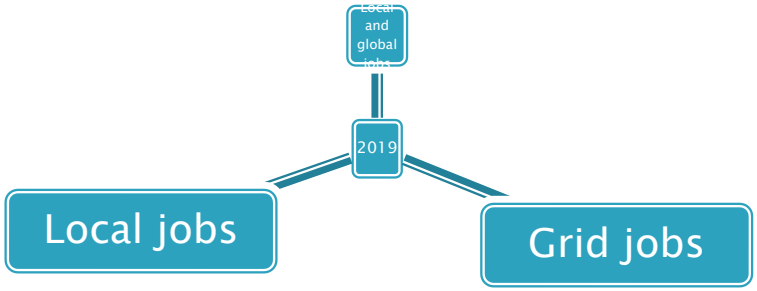
~1000 machines and ~40k slots

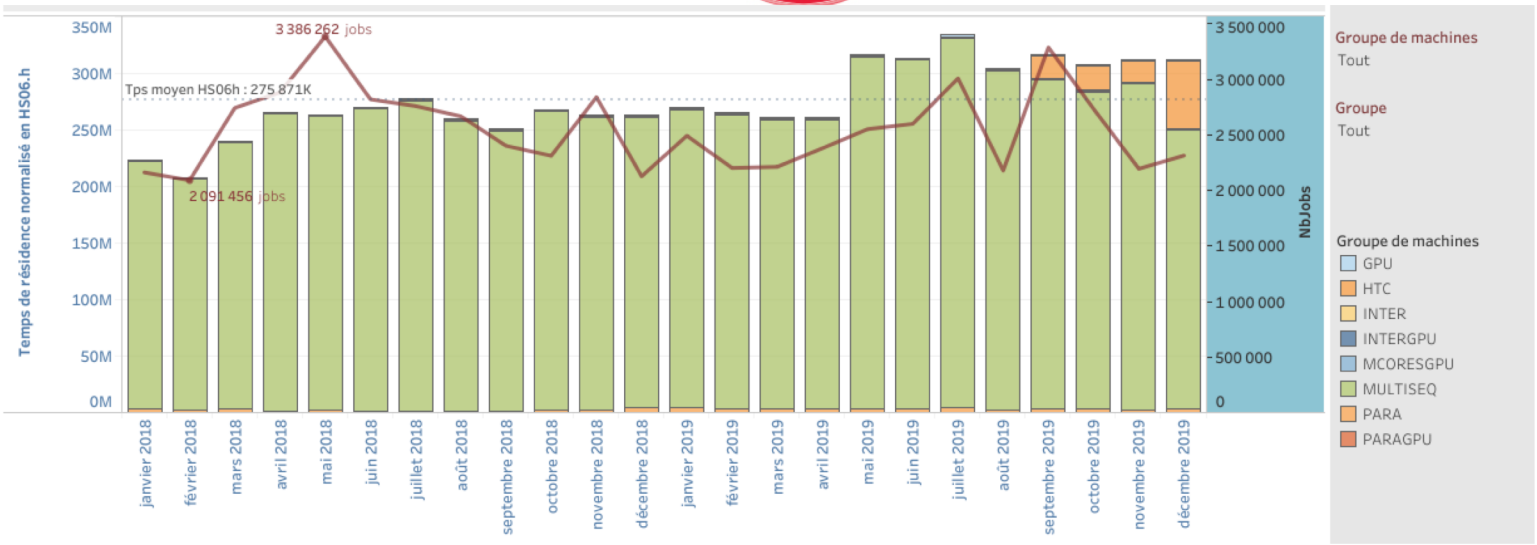
Univa Grid Engine:

Resource management and scheduler for 3 platforms
Used since 2012
License for 16000 cores

HTCondor:

No license, community sharing
First study in 2016 and PoC.
First deployment in 2019
Will serve Grid Jobs (>80% of total)
End resources Migration Q1/2020



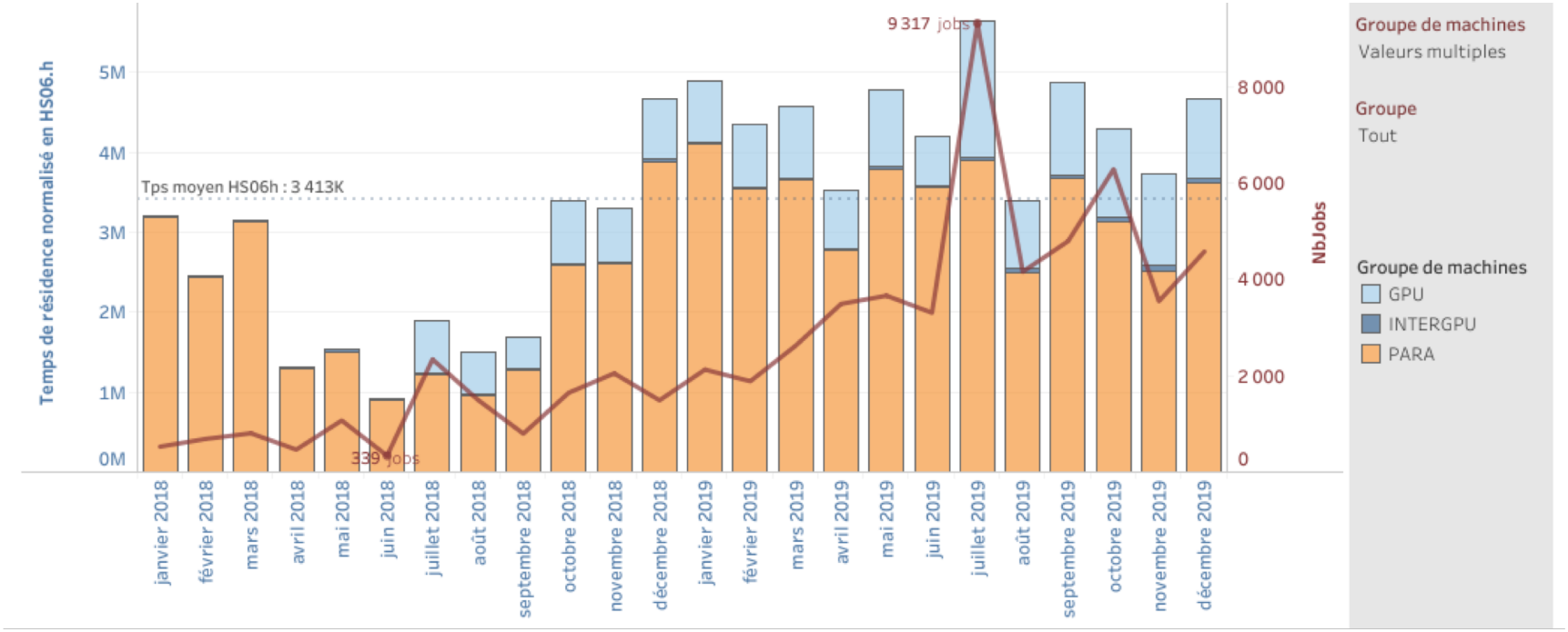


SIMBA a High Performance Computing (HPC) cluster :

512 physical cores
16 Dell C6320 with QDR IB interconnect

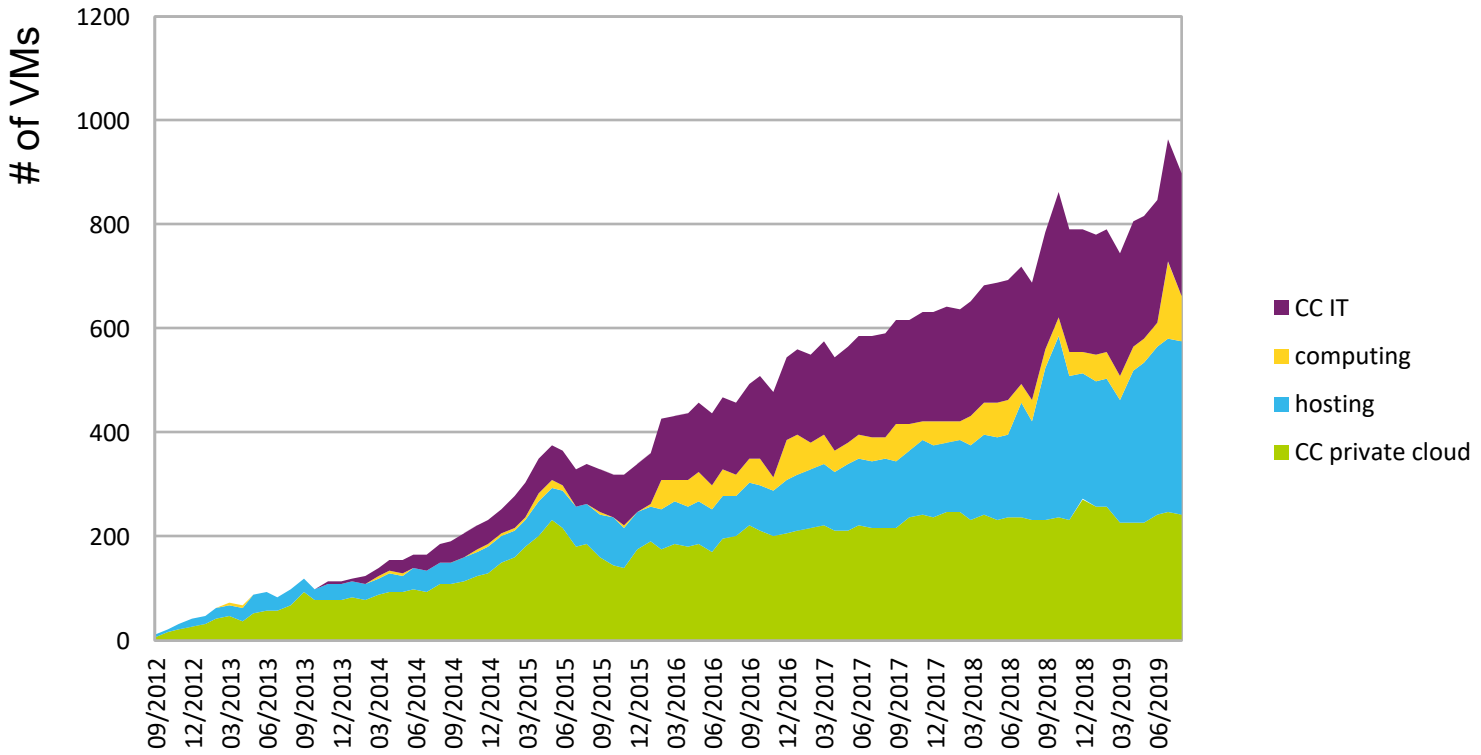
NALA, a GPGPU Cluster:

Since Sept 2016
Relies on K80 and V100: 40+24 GPUs
High speed interconnect using InfiniBand network
Using singularity to propose customized libraries



- Computing cloud platform based on Openstack.
  - Hosting computing and services
  - ~900 VMs
  - CEPH backend
  - Used as opportunist resource (Atlas)

projects : 57
users : 630
images : 581
networks : 70
hosts : 160
memory : 28TB
HT cores : 6248
storage : 1.1PB
(318 axes)



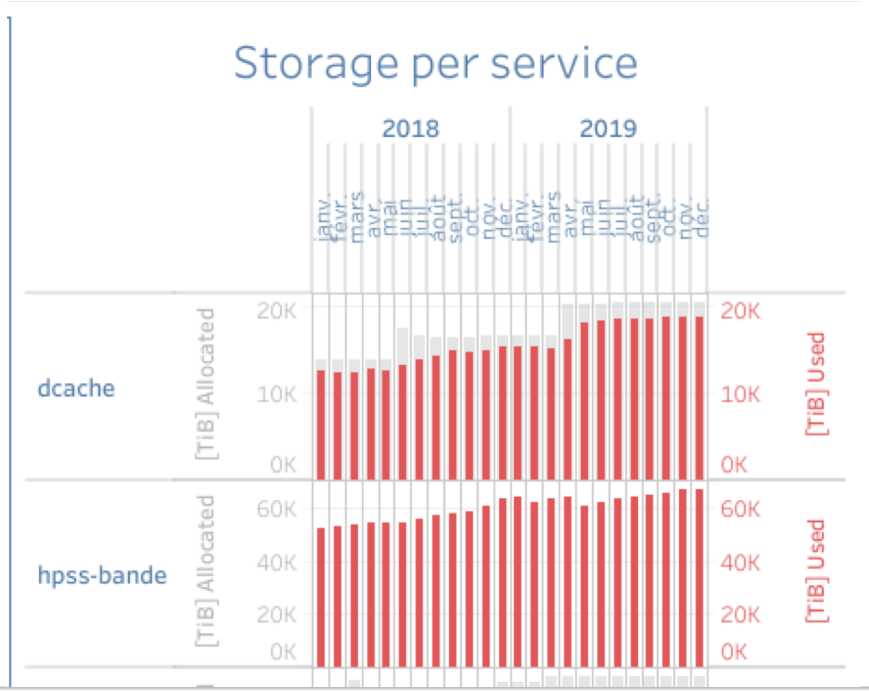
Reached 100PB in 2019

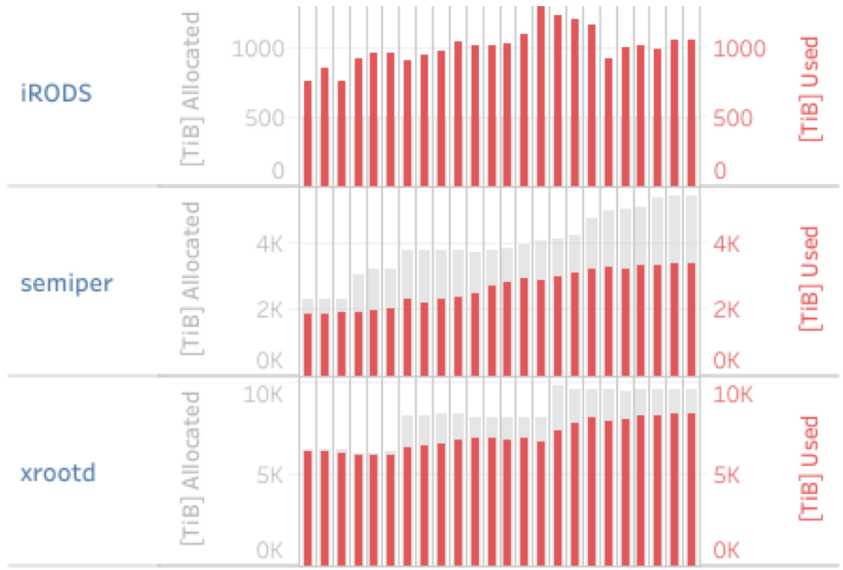
DISK :

- >30PB of disk on different technologies: dCache, XrootD, Irods, GPFS,
- AFS phased out ➔ home directories and group space moved to ISILON cluster
- CEPH in Openstack platform

Mass Storage:

- >60PB
- Cf. Pierre-Emmanuel Brinette's presentation

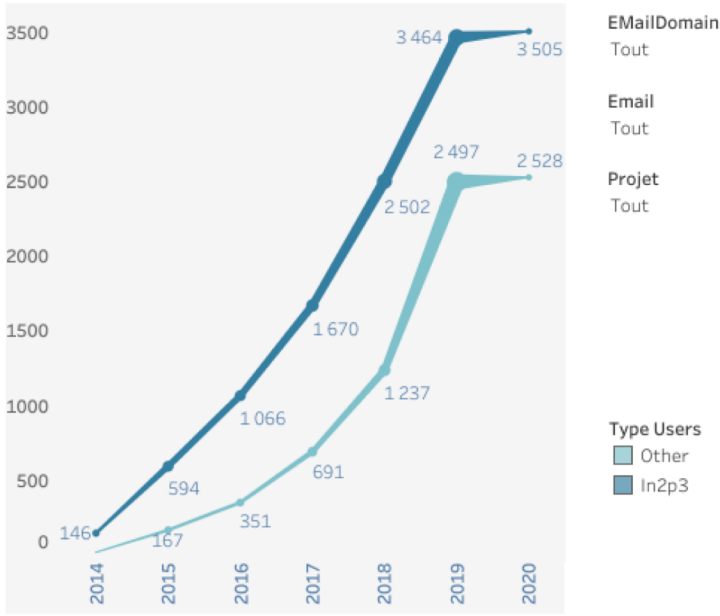




Ongoing Activities and technos (not exhaustive)

- Proposing Singularity as a container solution.
  - Currently deployed
- New GITLAB platform proposed
- Deployment of Kubernetes platform for web hosting
- IAM: Identity & Access agement
  - NIS & Kerberos decommissioned.
  - Replacing with RedHat IDM/Keycloak
  - Improving user management and authorization
  - Increasing functionalities (OIDC, APIs, RBAC..)
- Proposing a Service Catalog
  - Service portfolio with ITIL principles and CMDB links.
- Service portal
  - For users to access and use resources through portal: at its beginning
- Alert & Supervision system
  - Nagios ➔ Thruk+Naemon core

# of projects in GitLab



European and international activities

EOSC-Pillar

INFRAEOSC-05-2018-2019

EOSC-hub

PRACE

eXtreme DataCloud

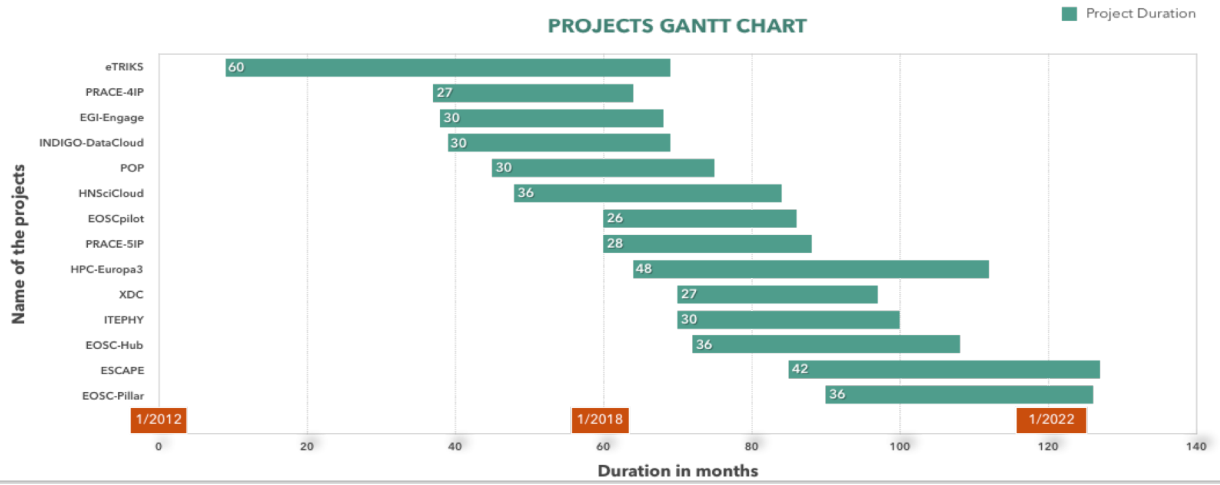
Data Management for extreme scale computing

- Participation in European projects to shape the European computing landscape
- Various topics of work:
  - Procurement, commercial clouds
  - Datalake, data management, data orchestration
  - Operations portal, monitoring services.
  - Coordination and management of national initiative within EOSC
  - HPC computing
  - Workflow, orchestration, containerisation
  - AI
  - MOOC Online courses, training
- Other projects such as DOMA, DOMA access, …

DOMA

HPC Europa3

iTHEPHY
Innovative Team - Teaching for Physics



ESCAPE

European Science Cluster of Astronomy & Particle physics
ESFRI research infrastructures