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

CC-IN2P3

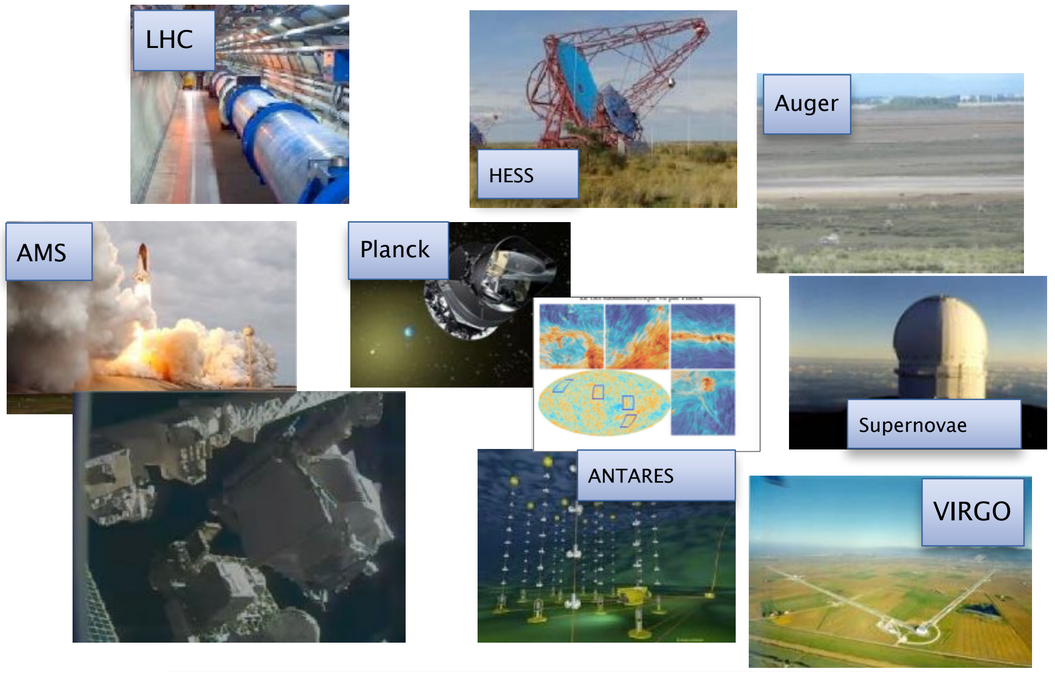
Visit of Chinese Academy of Sciences

CC-IN2P3 federates the main computing resources for :

High energy physics

Nuclear physics

Astroparticle physics



Dedicated computing center

Staff : ~88 people ~ 68 IT engineers

> 70 experiments

CC-IN2P3 some figures

24/24, 7/7, 365/365

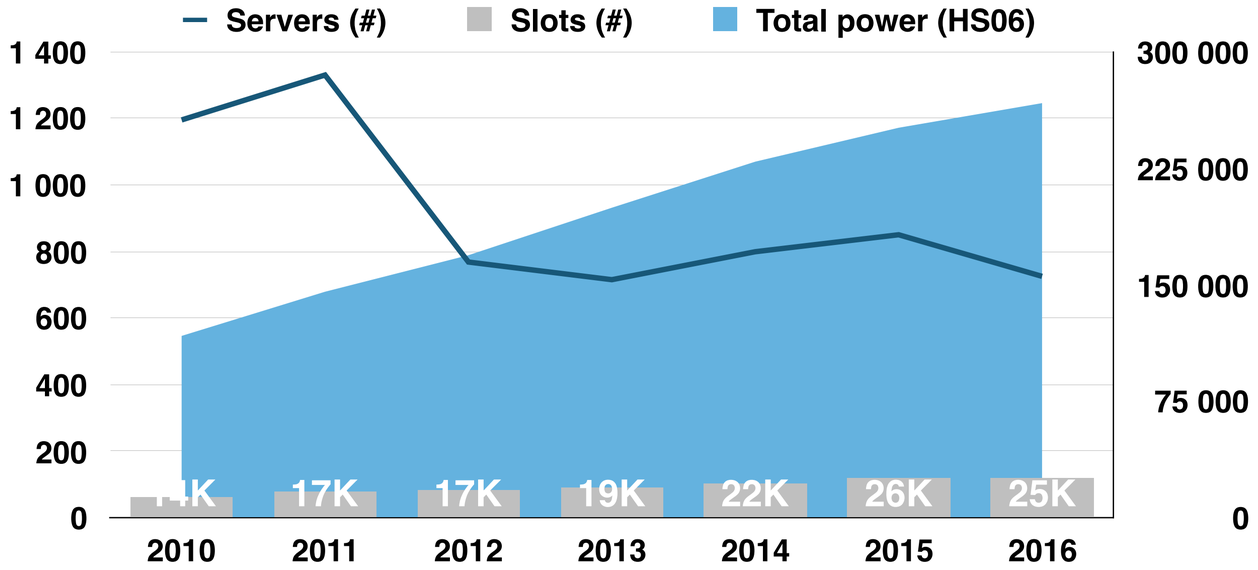
2 000 m2 office space ~100 people (incl. hosted)

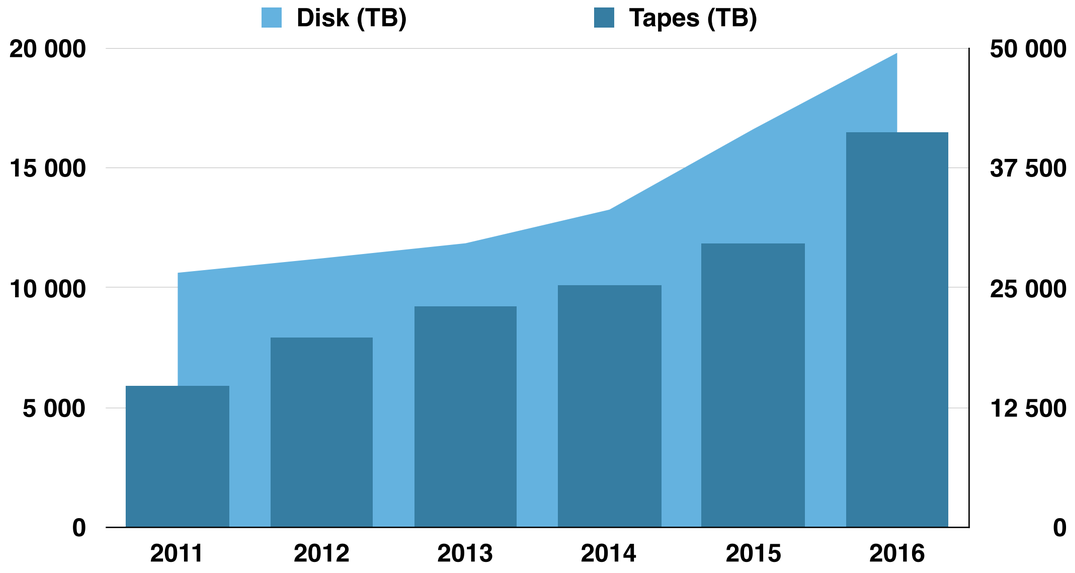
4 000 m2 technical areas

2 computing room of 850 m2 each

Hosts NREN and nearly all regional network operator POP

Resources usage in 2016





2016

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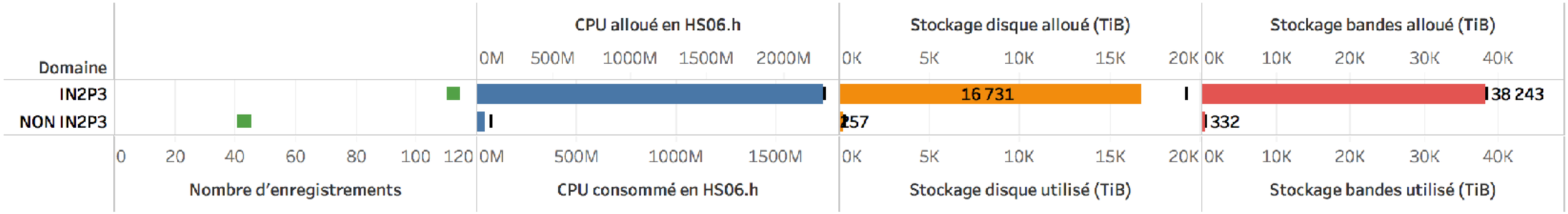

Les quantités allouées sont matérialisées par les barres noires, les quantités consommées ou utilisées sont matérialisées par les barres de couleur.

Resources usage in 2016

2016

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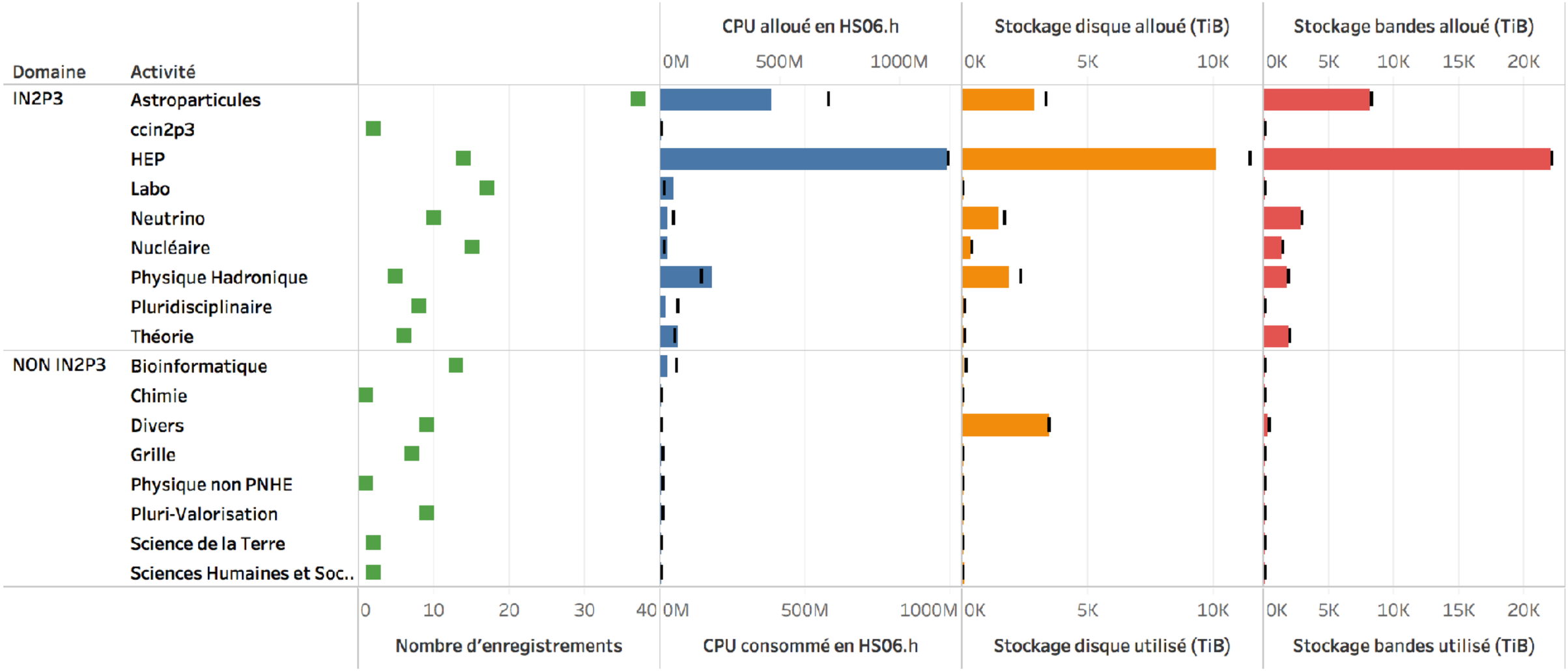


Infrastructures and platforms growth

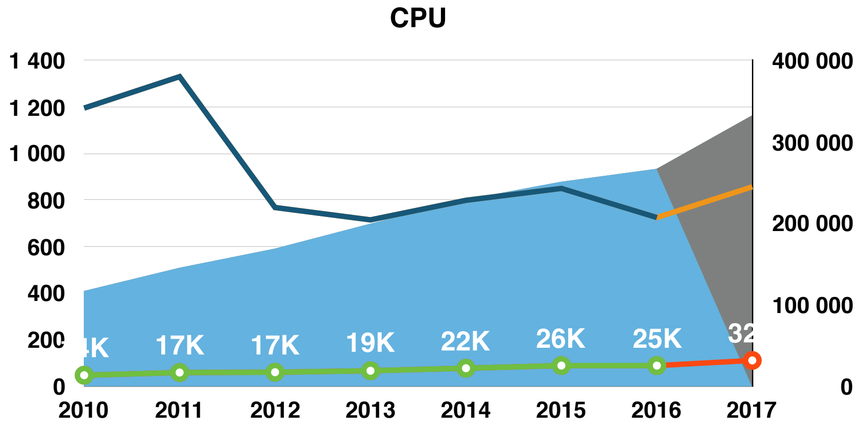
2017 capacity

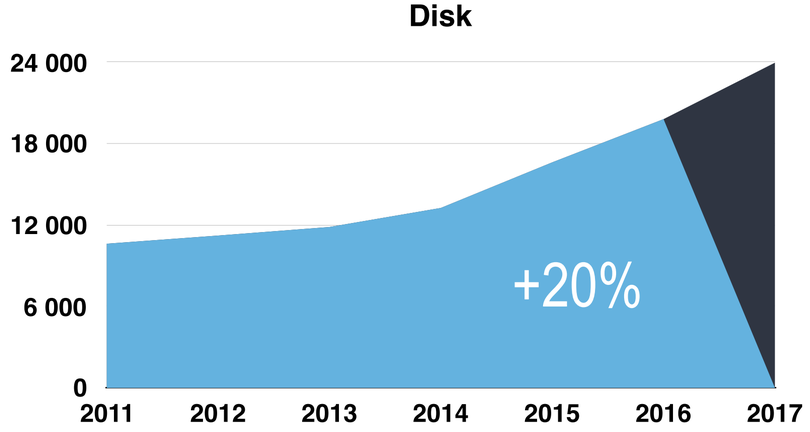
CPU : +37 kHS06 (LCG) + 29 kHS06 (others) increase of ~25 % over 2016

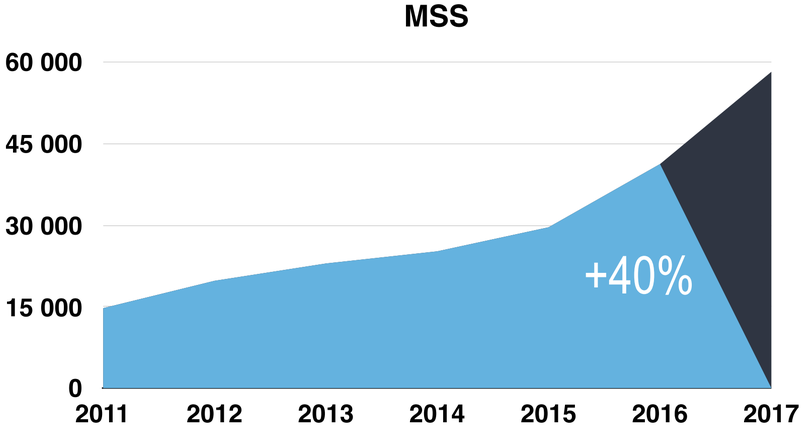
Disk DAS : +2,8 PB (LCG) + 700 TB (others) increase of ~20 % over 2016

High perf disk : + 660 TB (others) increase of ~30 % over 2016

Tapes : + 12 PB (LCG) + 5 PB (others) increase of ~40 % over 2016

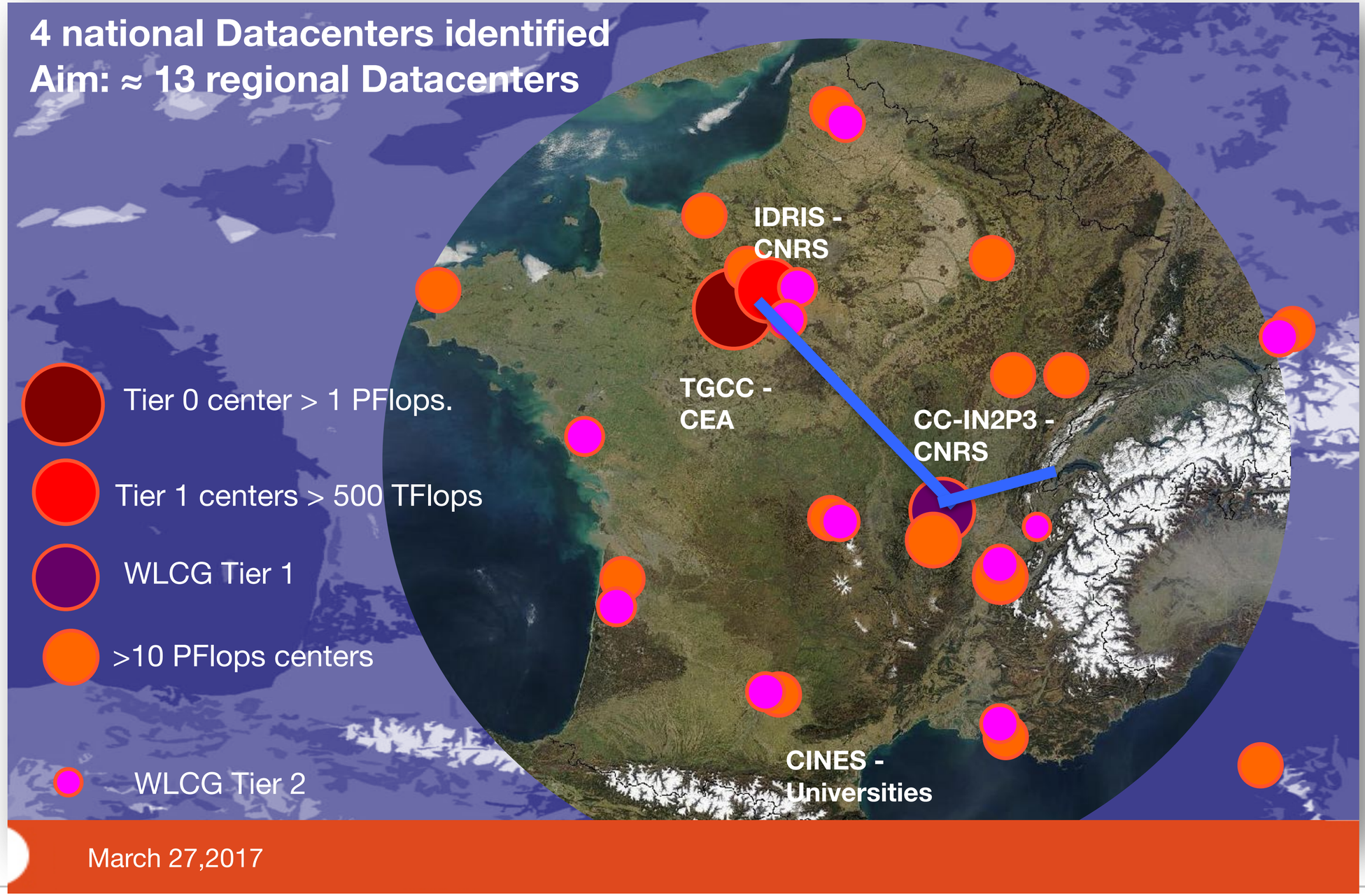






7,6 tons of hardware ! (232 computing servers, 55 of disk)

National and regional Computing



© U. Bassler

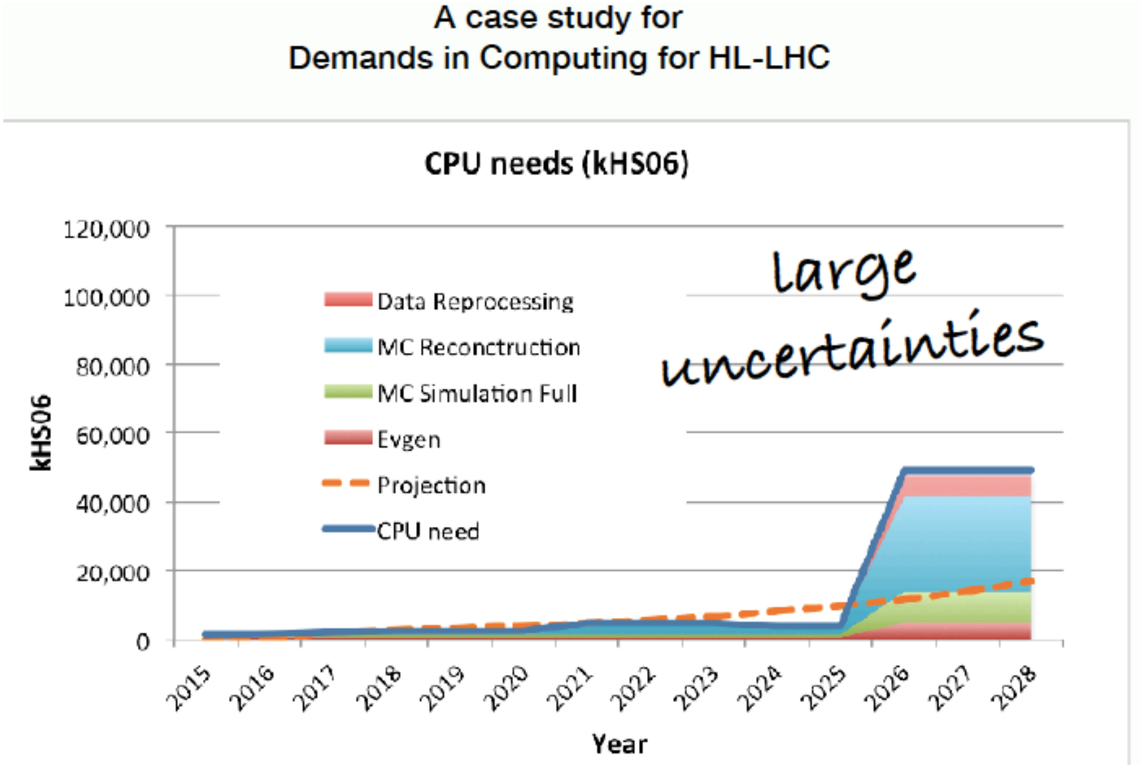
Computing Needs : LHC

Increase in computing needs for HL-LHC area

Need to produce smarter software

Need to increase resources

Need to change infrastructure model



Computing Needs CC-IN2P3

LHC : increase by 25% / year up to HL-LHC

But: also hosting other big players :

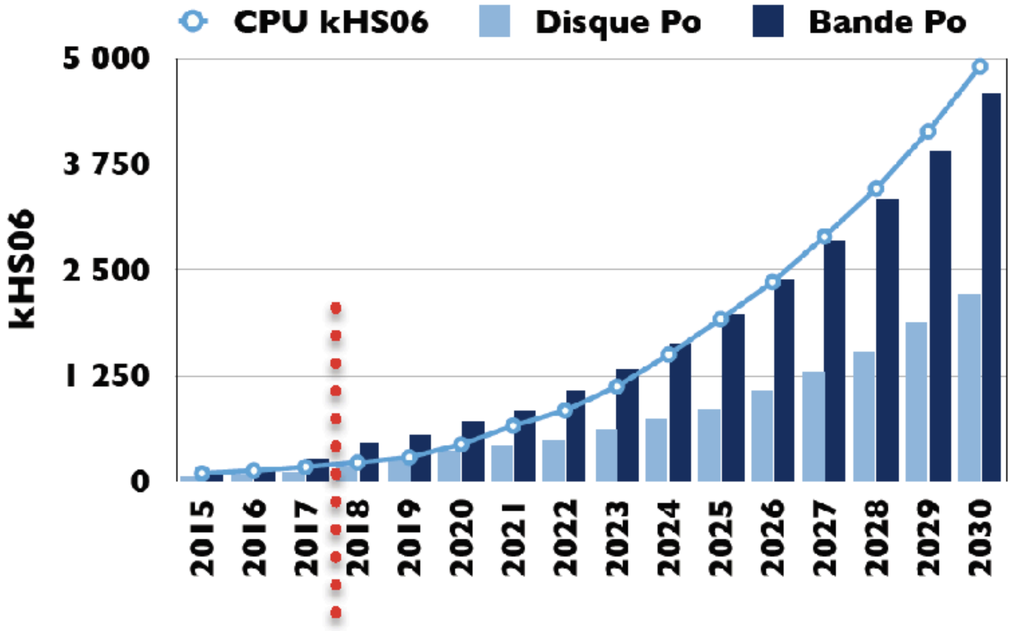
LSST : reprocessing 50% of the data replica of the entire dataset

Euclid : 1 of the 8 European Data centers - Estimate to contribute to 30% of the data storage and reprocessing resources

CTA : options still to be clarified

Required to host or provide computing for non-HEP

➔ Similar situation in most European Tier-1 WLCG Centers



En 2024	CPU kHS06	Disque Po	MSS Po
LHC	1 000	80	150
x2014	5	6	6

En 2030	CPU kHS06	Disque Po	MSS Po
LSST	2 400	100	266
EUCLID	67	150	52
CTA	80	52	176
∑	2547	302	494
x2014	12	22	20

CC-IN2P3 objectives

At institute level

- Consolidating astroparticules & cosmology experiments support
- Keep going with HEP
- Developing the use of CC by nuclear physics
- Set up projects « task force »

At national level

- Collaboration with IDRIS - CC
- French VLRI roadmap
- Upgrade CC project

At international level

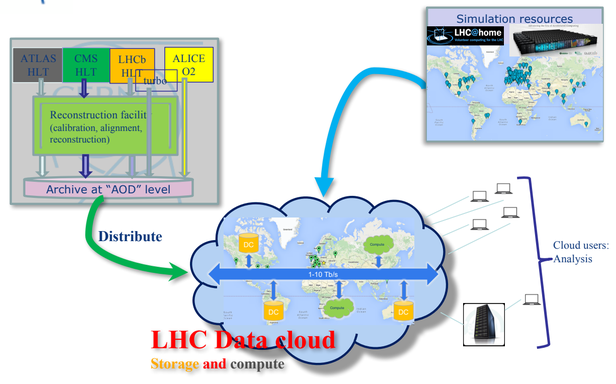
- CERN : « LHC DataCloud », Virtual DataCenter
- EU-T0
- EGI & EUDAT-CDI

Quick overview of e-Infrastructure services and their providers and which access mode is used by those providers

e-Infrastructure	GÉANT	EGI	PRACE	HELIX NEBULA	EUDAT	ZENODO	OpenAIRE
Services							
Network	x						
HTC		x ★					
HPC			x				
Cloud	x	x ★		x ★			
Data		x ★			x ★	x	x
Access Modes							
excellence driven		x	x				
market driven	x	x		x	x		
wide access	x	x			x	x	x

Source : e-IRG 2017 support document

Possible Infrastructure



Participation to European projects

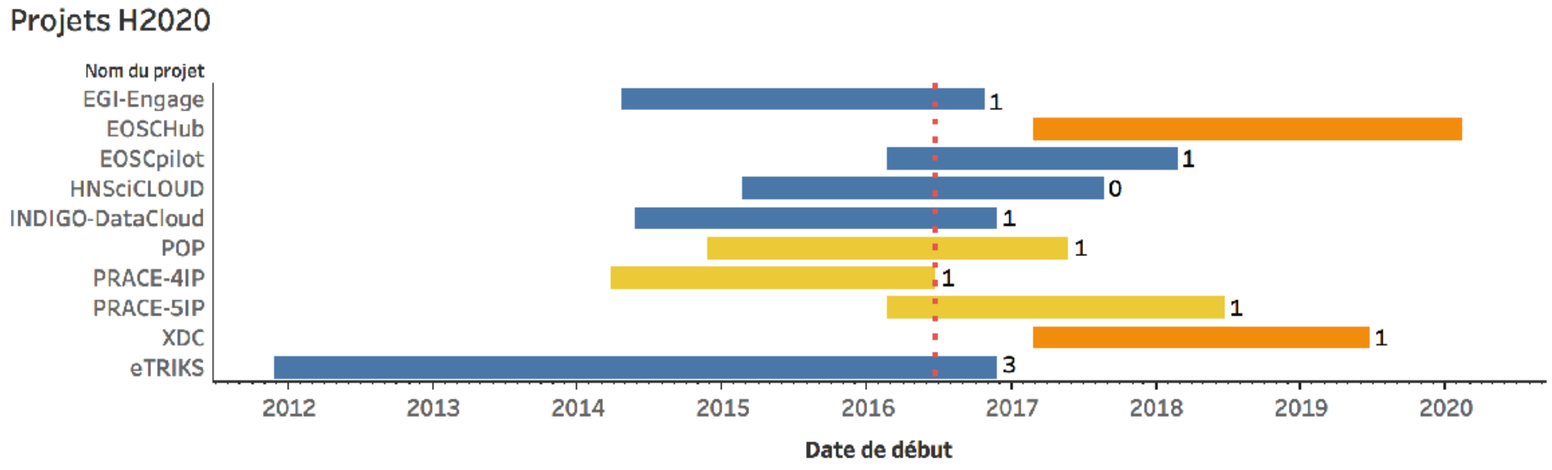
On going projects :

EGI-Engage : OperationsPortal
HNSciCloud : lead WP3 (Design) + work into the technical committee
EOSCPilot : task 6.1 (gap analysis on going) & task 6.3 (e-infra interoperability)
Indigo-DataCloud : Synergy & FutureGateway components
eTRIKS : cloud infrastructure
PRACE4-IP&PRACE5-IP : data transfer, Spark
HPC-Europa3 : containers

To start next year :

EOSCHub : OpsPortal, Argo
XDC (eXtreme DataCloud)

Période de temps des projets H2020 et nombre de CDD financés par projet



Thanks for your attention