Le CC-IN2P3

Journées EUCLID - Décembre 2014

Le CC-IN2P3

Institut National de Physique Nucléaire et de Physique des Particules - IN2P3

Centre de calcul dédié

Mission principale : déployer et opérer les moyens informatiques nécessaires à la mise en œuvre de la politique scientifique de l'IN2P3

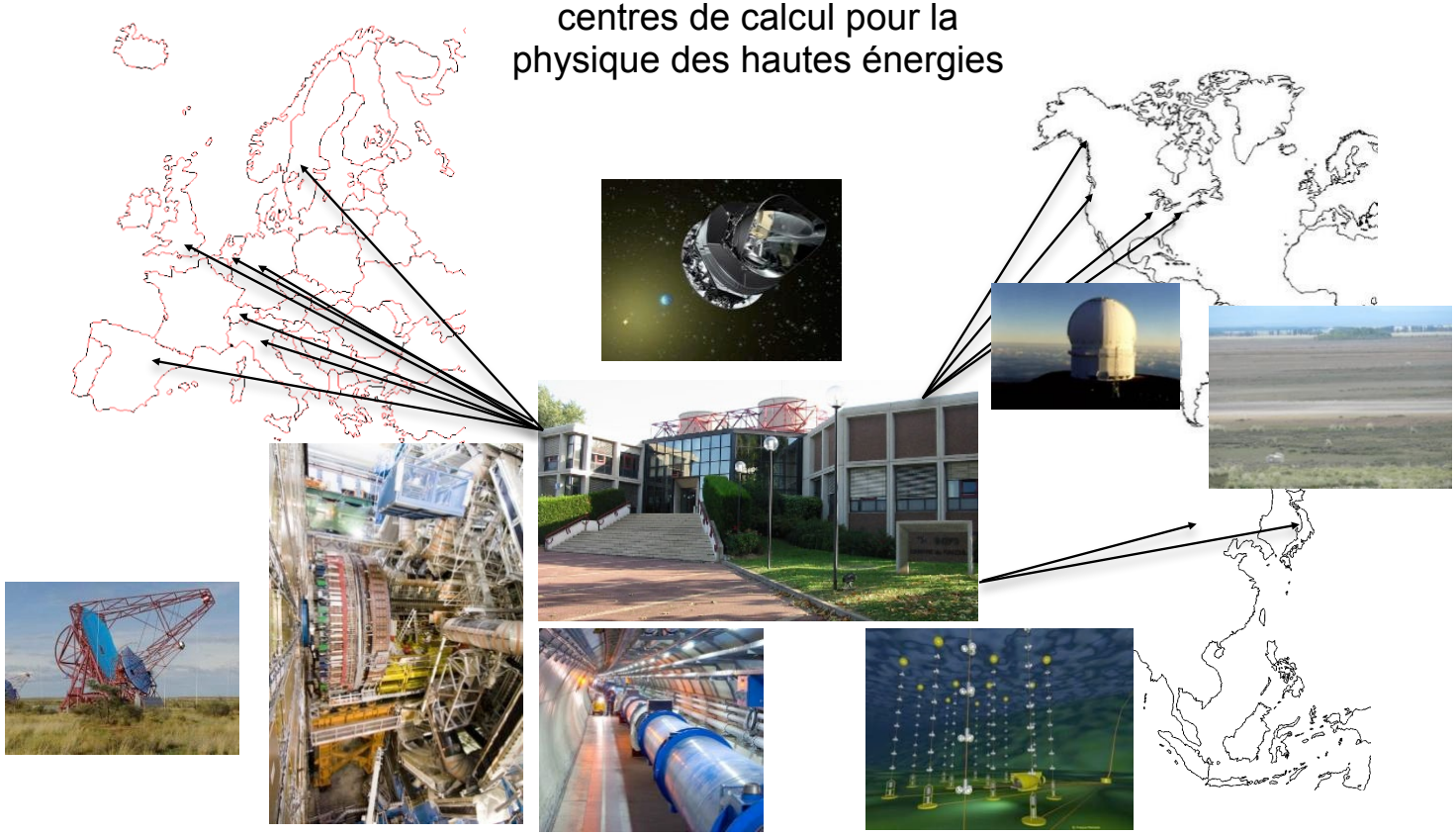
Mettre son expertise et une partie de ses moyens à la disposition de l'ensemble du CNRS

S'ouvrir vers l'université et la région

Le CC-IN2P3 est une Unité de Service et de Recherche du CNRS fonctionnant en partenariat avec le CEA / DSM / Irfu

A dimension internationale

Le CC-IN2P3 fait partie d'un réseau mondial de grands centres de calcul pour la physique des hautes énergies

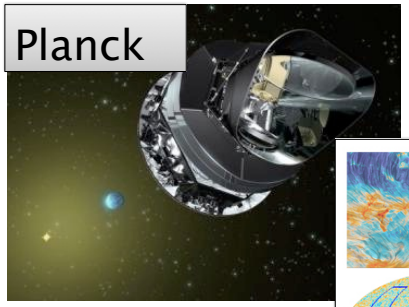


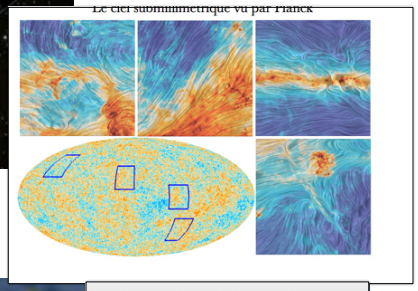
LHC

HESS

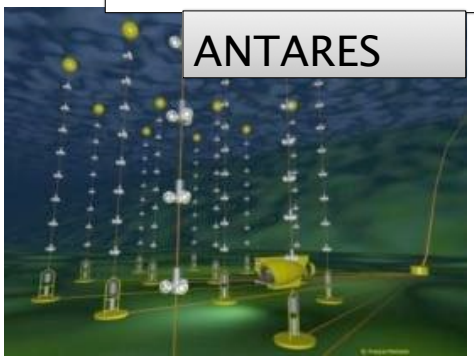
Auger

AMS


Planck

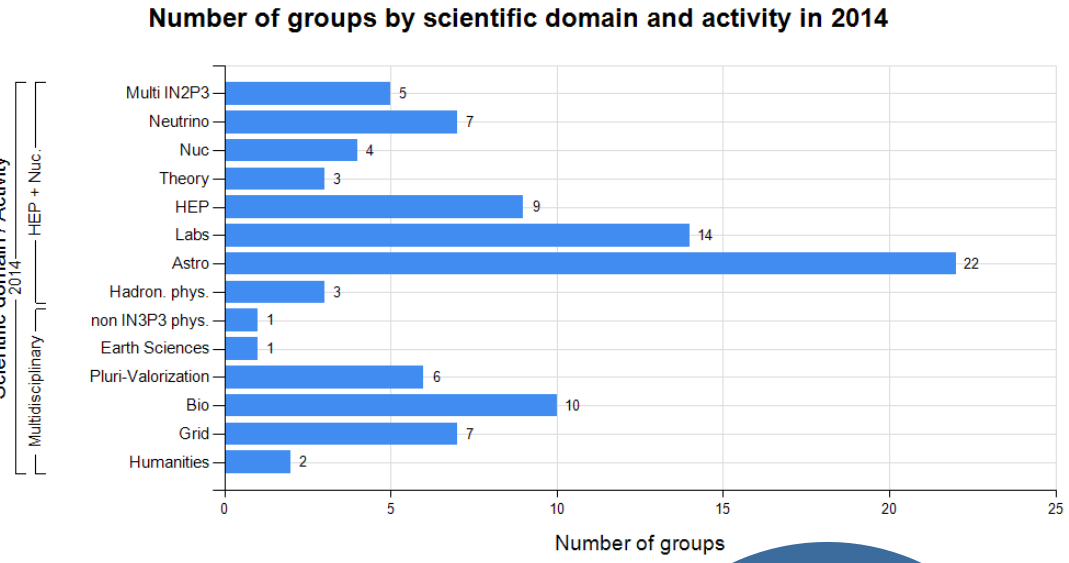


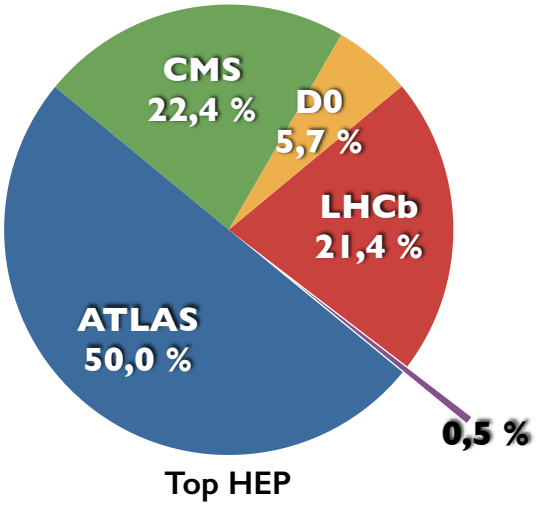
Supernovae


ANTARES

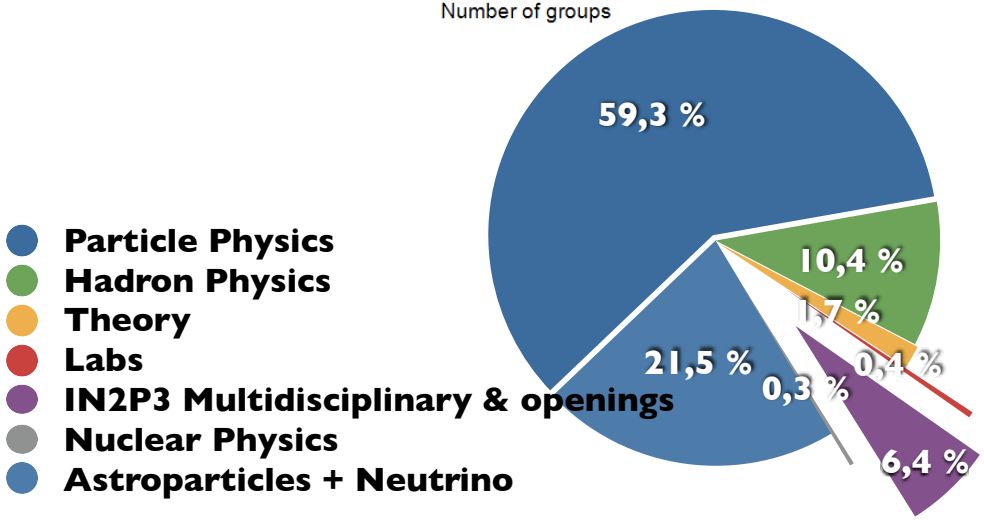
VIRGO

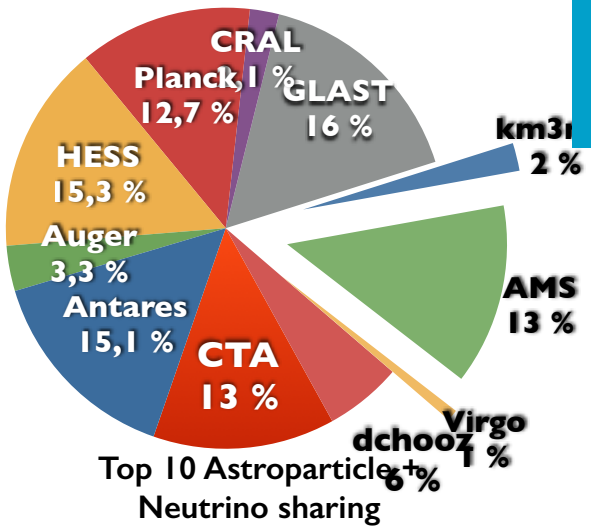
Utilisateurs : répartitions et consommations CPU (oct. 2014)





Top HEP





Top 10 Astroparticle + Neutrino sharing

CPU

~ 20 k vcores / **211** kHS06

Disk storage

- DAS = **12,4 PB**
- GPFS = **1,4 PB**

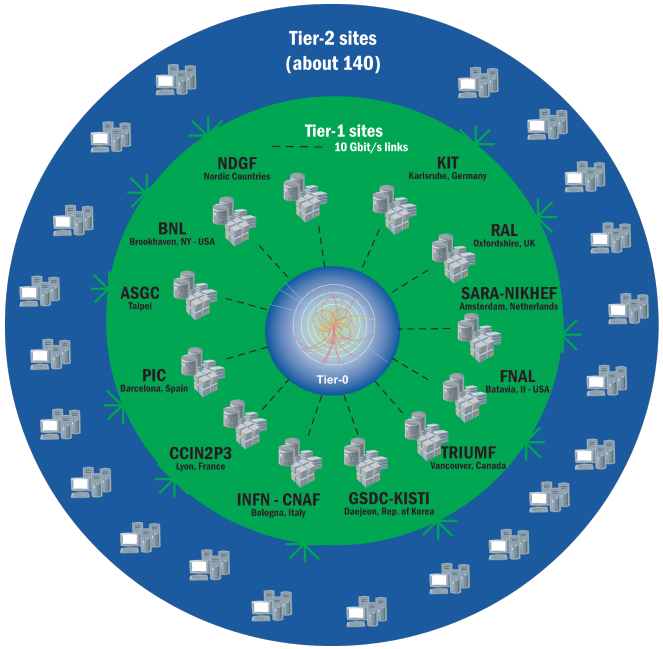
Tapes

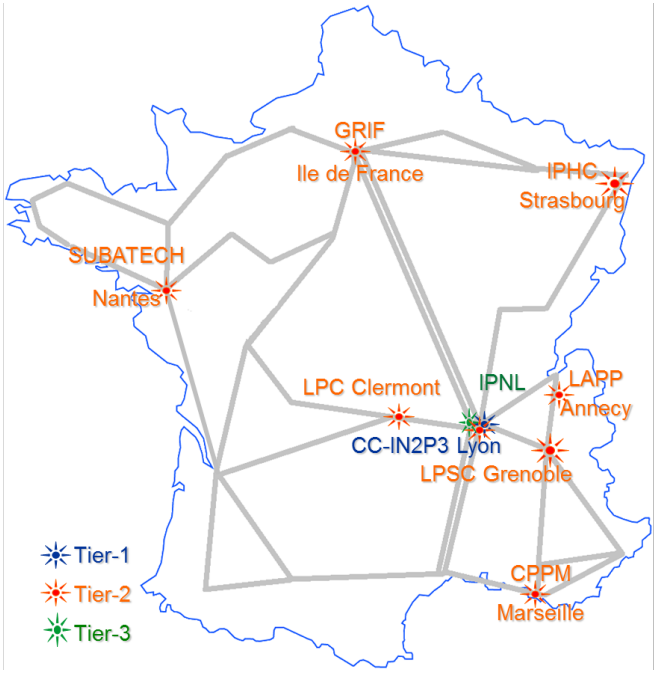
- **24,4 PB**

Backup (TSM)

5,5 Po

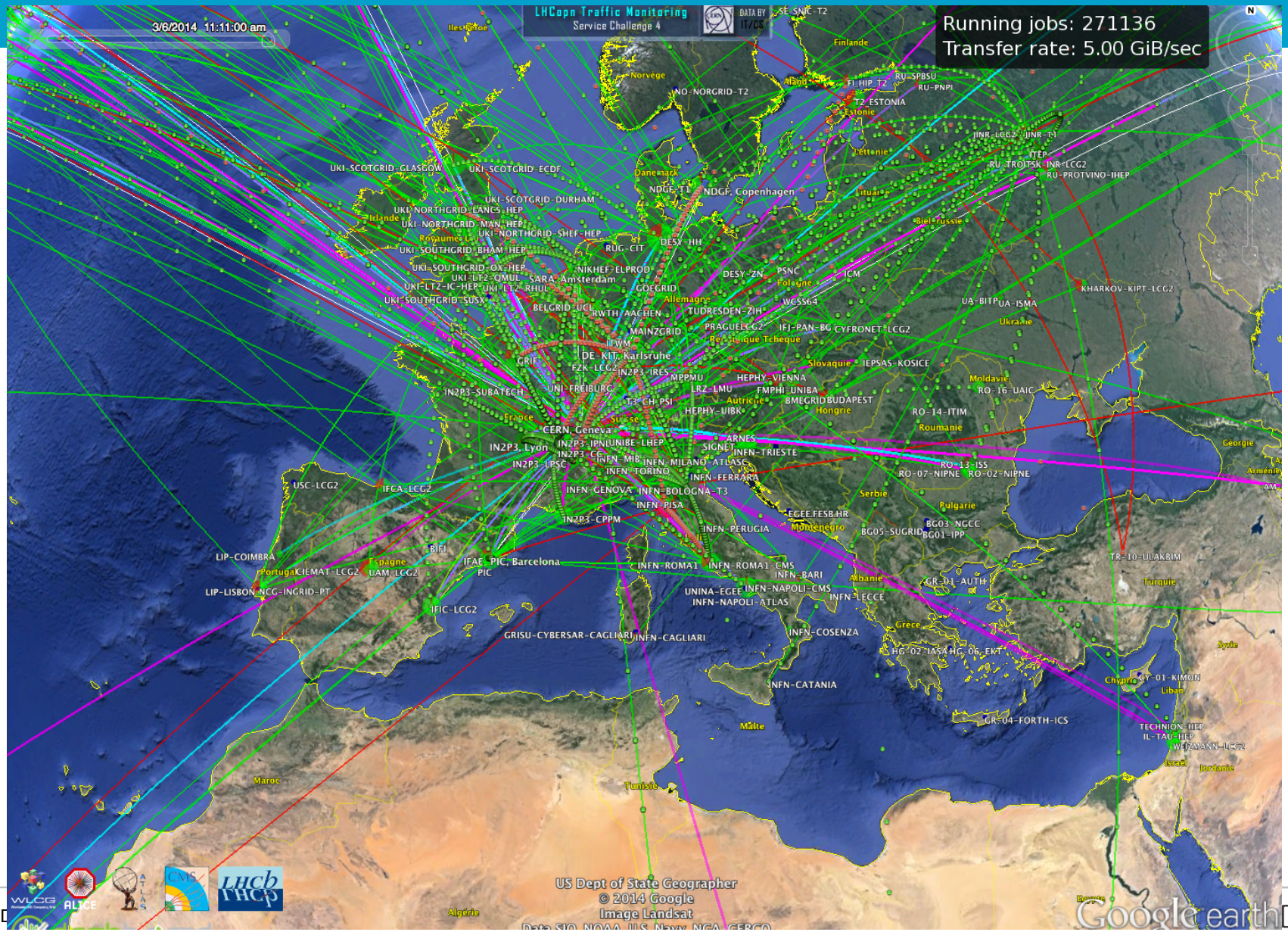
WLCG et LCG-France





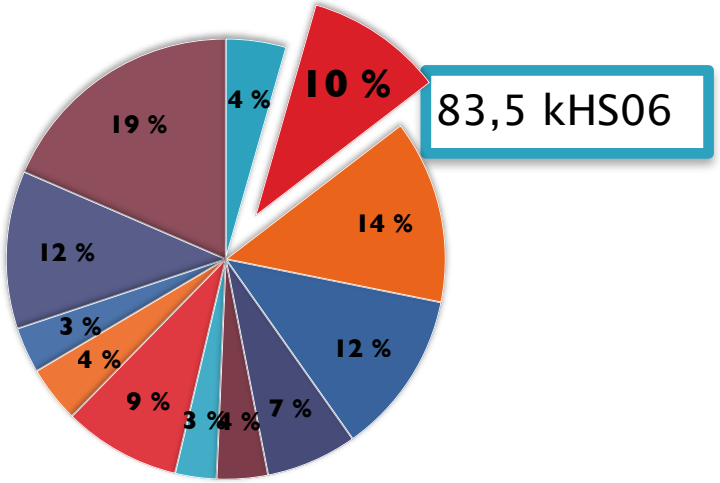
Role	Site	ALICE	ATLAS	CMS	LHCb
Tier-1	IN2P3-CC	✓	✓	✓	✓
Tier-2	IN2P3-CC-T2 (AF)	✓	✓	✓	✓
	IN2P3-CPPM		✓		✓
	GRIF	✓	✓	✓	✓
	IN2P3-LPC	✓	✓		✓
	IN2P3-IPHC	✓		✓	
	IN2P3-LAPP		✓		✓
	IN2P3-LPSC	✓	✓		
	IN2P3-SUBATECH	✓			
Tier-3	IN2P3-IPNL	✓		✓	

Le CC-IN2P3 est l'un des 12 sites Tier 1 de la grille mondiale WLCG

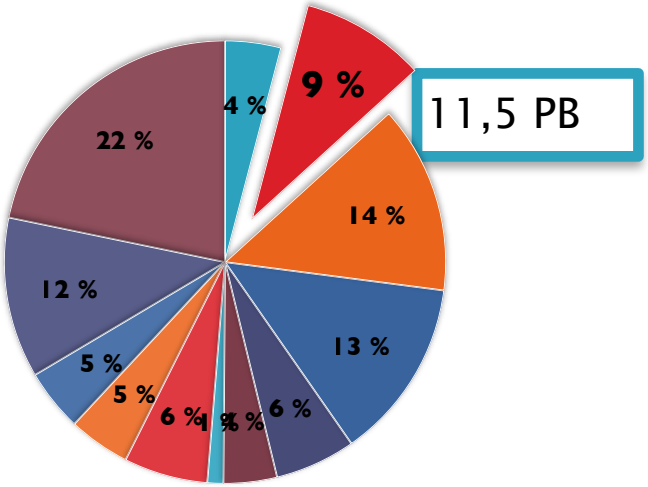

LHCopn Traffic Monitoring
Service Challenge 4
DATA BY IT/CS
3/6/2014 11:11:00 am
Running jobs: 271136
Transfer rate: 5.00 GiB/sec
CERN, Geneva
IN2P3, Lyon
DE_KIT, Karlsruhe
NDGF, Copenhagen
SARA, Amsterdam
PIC, Barcelona
INFN-ROMA1
INFN-CNAF
RAL-LCG2
TRIUMF-LCG2
BNL-ATLAS
FNAL-FERMILAB-LCG2
NIKHEF-ELPROD
GRIF
FZK-LCG2
IN2P3-IRES
MPPMU
LRZ-LMU
MAINZGRID
RWTH-AACHEN
GOEGRID
DESY-HH
DESY-ZN
PSNC
CYFRONET-LCG2
IFJ-PAN-BG
PRAGUELCG2
IEPSAS-KOSICE
HEPHY-VIENNA
BUDAPEST
RO-14-ITIM
RO-07-NIPNE
RO-02-NIPNE
RO-13-ISS
RO-16-UAIC
UA-BITP
UA-ISMA
KHARKOV-KIPT-LCG2
RU-PROTVINO-IHEP
RU-PNPI
RU-SPBSU
T2_ESTONIA
NO-NORGRID-T2
FI_HIP_T2
SE_SNIC_T2
INFN-MILANO-ATLASC
INFN-TORINO
INFN-FERRARA
INFN-BOLOGNA-T3
INFN-PISA
INFN-PERUGIA
INFN-ROMA1_CMS
INFN-BARI
INFN-NAPOLI-CMS
INFN-LECCE
INFN-COSENZA
INFN-CATANIA
INFN-CAGLIARI
INFN-TRIESTE
INFN-GENOVA
INFN-NAPOLI-ATLAS
UNINA-EGEE
EGEE.FESB.HR
BG03-SUGRID
BG03-NGCC
BG01-IPP
GR-01-AUTH
GR-04-FORTH-ICS
HG-02-IASA
HG-06-EKT
TR-10-ULAKBIM
CY-01-KIMON
TECHNION-HEP
IL-TAU-HEP
WEIZMANN-LCG2
IFCA-LCG2
USC-LCG2
IFIC-LCG2
LIP-COIMBRA
LIP-LISBON
CIEMAT-LCG2
UAM-LCG2
GRISU-CYBERSAR-CAGLIARI
UKI-SCOTGRID-GLASGOW
UKI-SCOTGRID-ECDF
UKI-SCOTGRID-DURHAM
UKI-NORTHGRID-LANCS-HEP
UKI-NORTHGRID-MAN-HEP
UKI-NORTHGRID-SHEF-HEP
UKI-SOUTHGRID-BHAM-HEP
UKI-SOUTHGRID-OX-HEP
UKI-LT2-QMUL
UKI-LT2-IC-HEP
UKI-LT2-RHUL
UKI-SOUTHGRID-SUSX
BELGRID-UCL
IPHC
IPNL
LAPP
LPSC
CPPM
IRFU
SUBATECH
UNI-FREIBURG
T3_CH_PSI
HEPHY-UIBK
BMEGRID
WCSS64
TUDRESDEN-ZIH
MPPMU
Running jobs: 271136
Transfer rate: 5.00 GiB/sec
US Dept of State Geographer
© 2014 Google
Image Landsat
Google earth

L'IN2P3 dans et l'IRFU dans WLCG

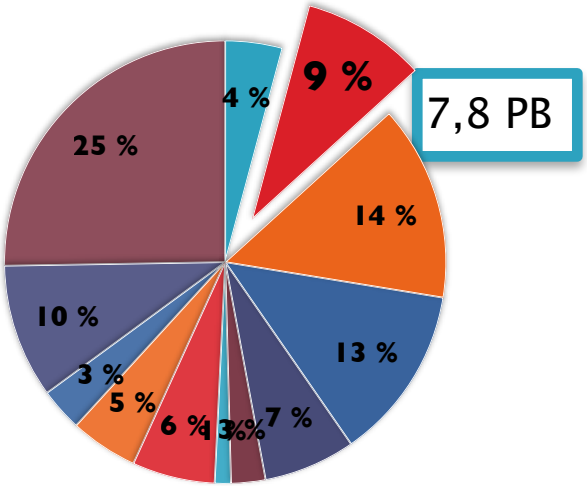
2014 T1 Pledged CPU Capcacity



2014 T1 Pledged Disk Capacity



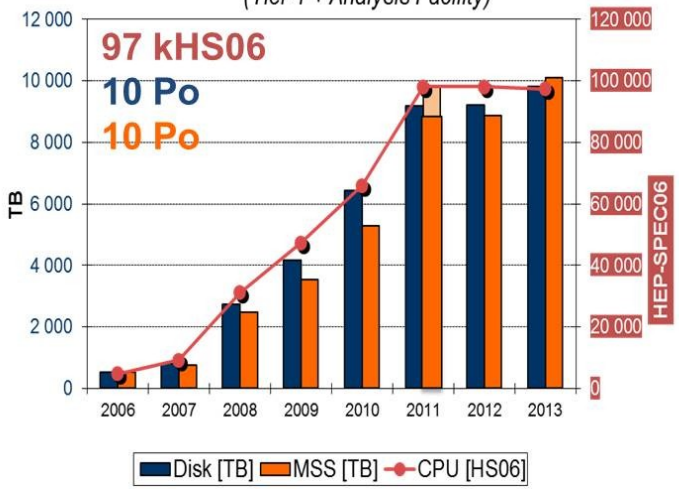
2014 T1 Pledged Tape Capacity



Canada · France · Germany · Italy · Netherlands · Nordic · Korea · Russia · Spain · Taïwan · UK · USA

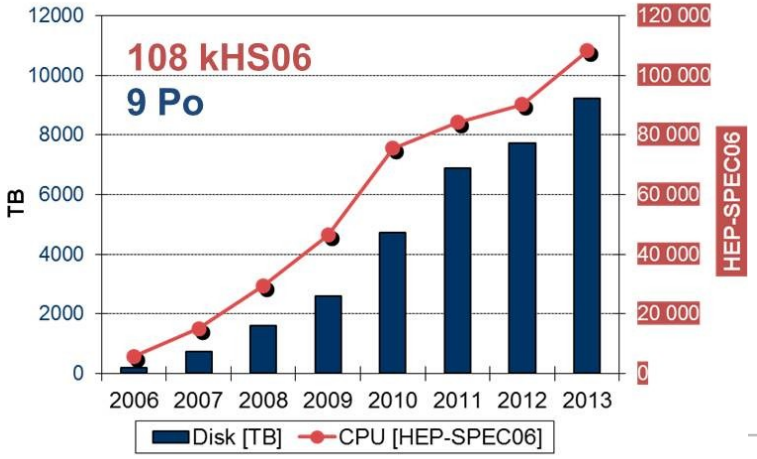
Resource Deployment plan

(Tier-1 + Analysis Facility)



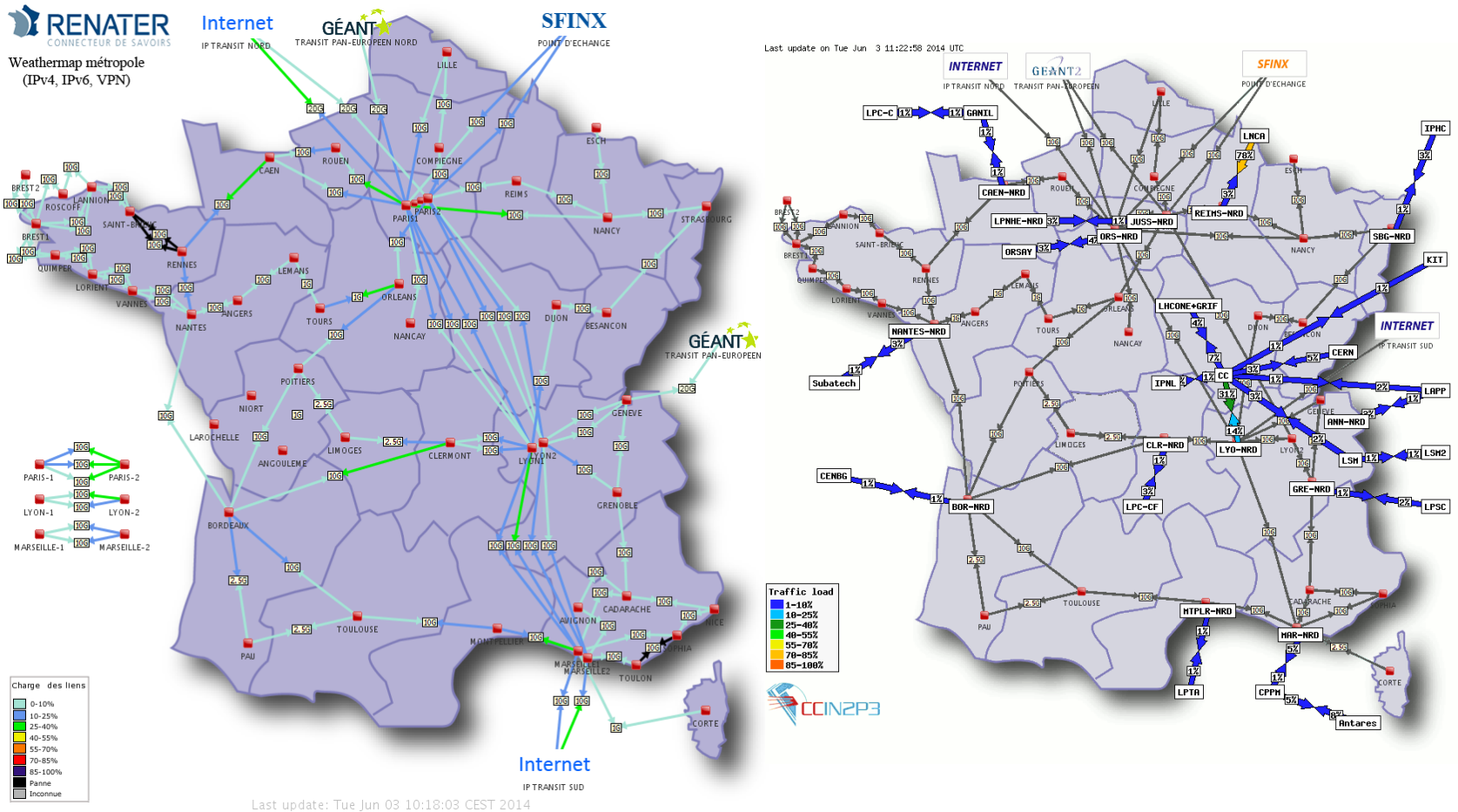
Evolution Ressources LCG-France

Sites T2-T3 hors CC-IN2P3

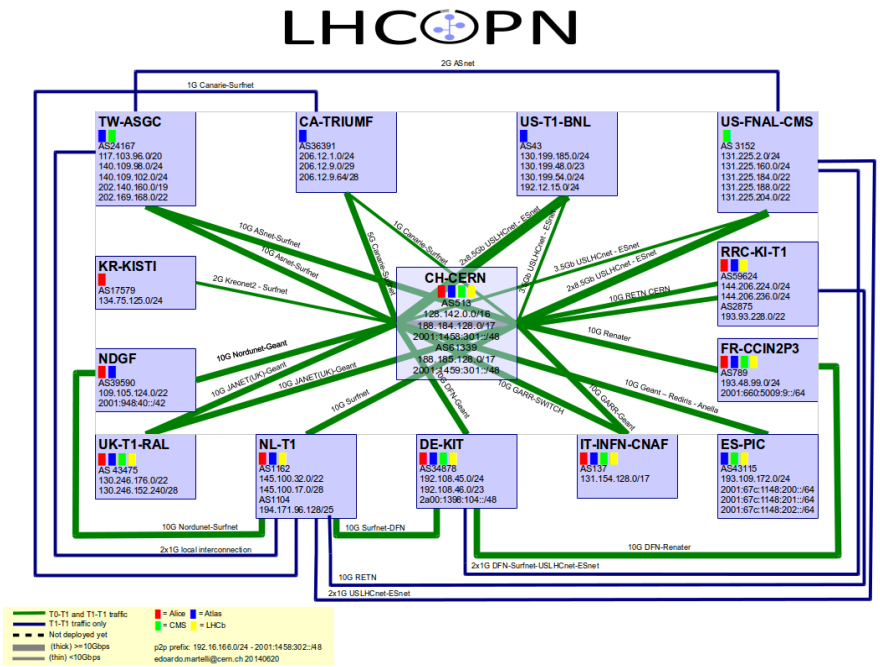


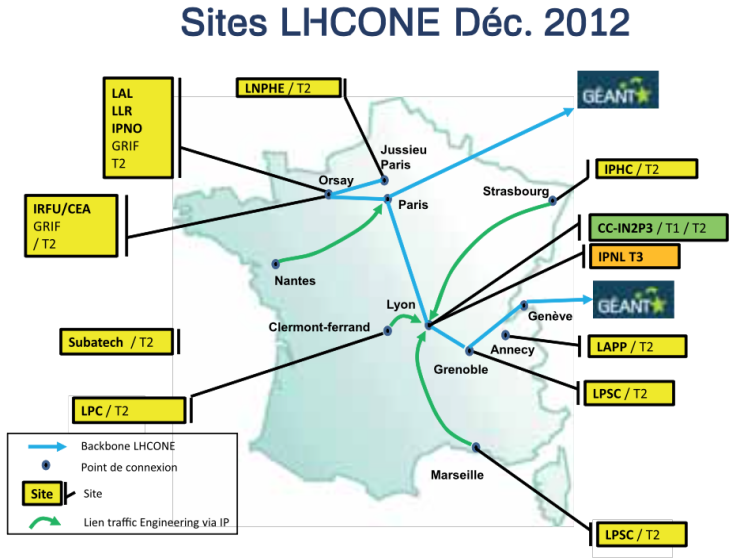
%	CPU	Disque	Bandes
T1 / ∑ T1	10,17	9,18	9,23
T1+T2s / ∑ T1+T2s	9,59	9,40	9,23

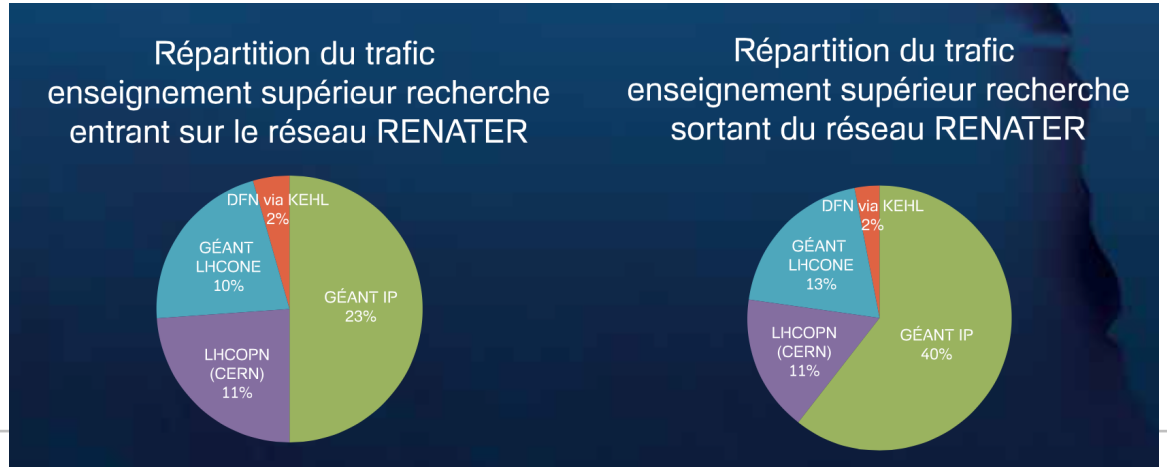
Topologie réseau



Le réseau pour WLCG et LCG-France







Estimated needs of future (and on-going) experiments

LSST (Large Synoptic Survey Telescope) :
- reprocessing of half of the data
- CC will host all the processed data

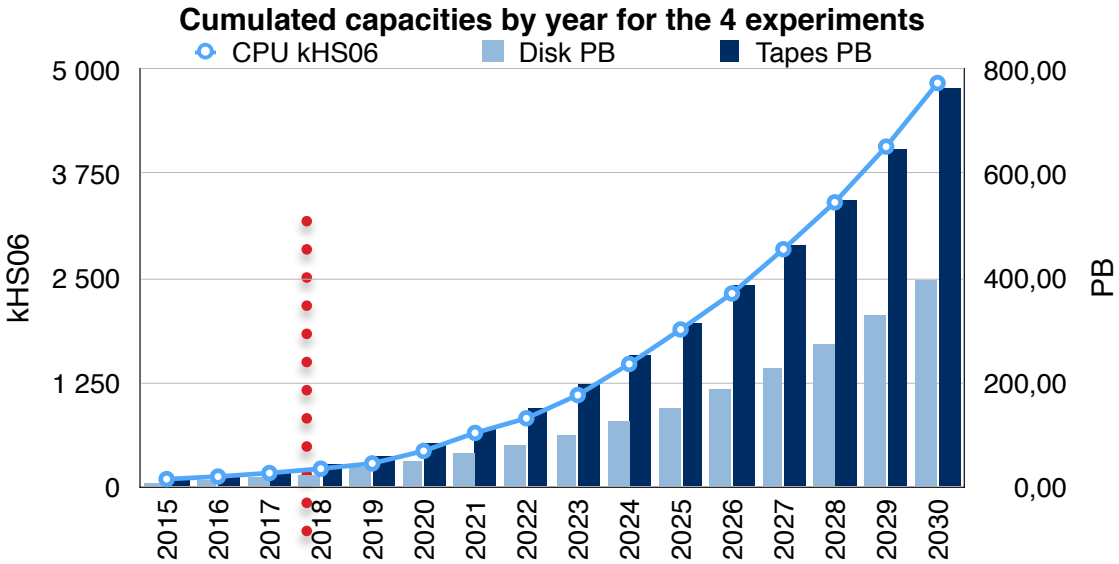
EUCLID : CC-IN2P3 will be one of the 8 "Sciences Data Centers" of this European space mission and should provide 30% of the resources (CPU and storage)

CTA : CC-IN2P3 may be led to operate for it, also by 2030, at least a 25% of 88 kHS06 for CPU, 207 PB for disk and 507 PB for tapes.

LHC : ~+25% per year indicates that at the end of the LHC Run 3 a **T1** capacity of

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

In 2030	CPU kHS06	Disk PB	MSS PB
LSST	2 400	100	266
EUCLID	67	150	52
CTA	22	52	127
Σ	2 489	302	445
x2014	12	22	18



Computing rooms : VIL2

Base infrastructure designed to fit the final configuration (wires, pipes…)

Everything else is modular (transformers, UPS, chillers, etc.) and can be installed later as a function of the needs

Best PUE : ~ 1.47

Capacity : 80 racks

28 installed - 52 left

1 rack = 730 TB or 20,5 kHS06 (2014)

We have a plan : see Xavier's talk

2*250 m2 to use

Investment for 80 racks : from 1.5 to 2 M€ (Tier II) :

wires, pipes, transformers, chillers without racks and servers