

CC-IN2P3

(Centre de Calcul de l'Institut de Physique Nucléaire
et de Physique des Particules)

Computing centre located in Lyon and essentially
dedicated to the activities of the Institute: nuclear
physics, particle physics and astroparticle physics

Brief description of the centre

Who can become a user and how

Organisation of the HESS computing group

DESCRIPTION OF THE CENTRE

COMPUTING

Farm of 1200 computers corresponding to 6860 processors with a clock frequency of 2.2GHz and 2GB of RAM /proc (480 computers are bi-pro quadri core)

The total computing power is 10^7 SpecInt2000 (25.7 Tflps)

Most of these computers run under

Scientific Linux 4 (SL4) 32-bit and a few SL4 64-bits

At the beginning of year 2008 only SL4 OS (no more SL3)

DESCRIPTION OF THE CENTRE

STORAGE (I)

3 types of storage: AFS, “semiper”, hpss, + xrootd cache

AFS: 7.2 TB

- home users 200 MB/user *backup*
- experiment code (throng_dir) max 16 GB *backup*
- space “common” to an experiment (group_dir) *no backup*

(Andrew File System

http://en.wikipedia.org/wiki/Andrew_File_System)

This space can be reached by external users who have AFS installed

DESCRIPTION OF THE CENTRE

STORAGE (II)

“semiper”: 190 TB of NFS or GPFS disks (→ 700 TB GPFS)

can reach 1 TB or more for each experiment

no backup

(IBM's General Parallel File System:

http://en.wikipedia.org/wiki/IBM_General_Parallel_File_System)

hpss:

2.7 PB (tapes) with 80 TB of cache

backup

(High Performance Storage System

<http://www.hpss-collaboration.org/>)

xrootd cache: 300 TB

no backup

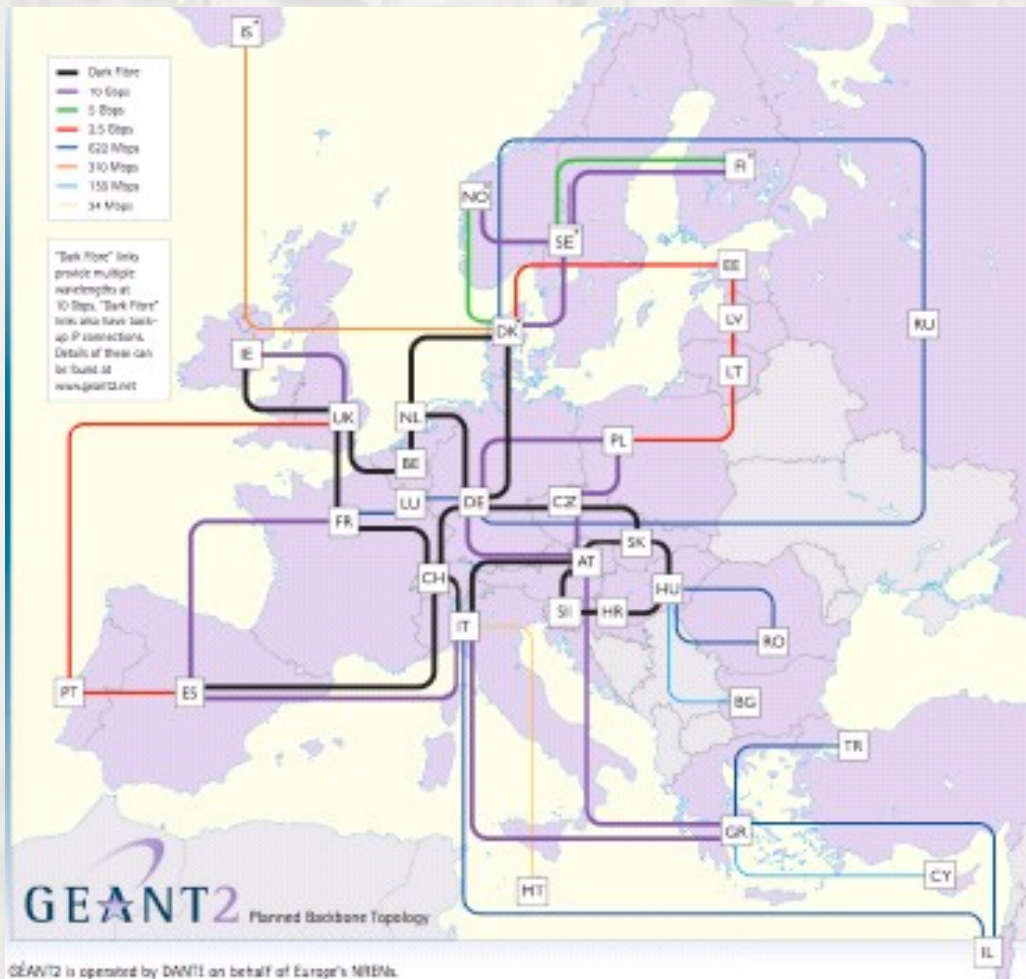
File server, allows hpss files to stay a long time on disk,
so easier to access, and quicker

(<http://xrootd.slac.stanford.edu/papers/Scalla-Intro.htm>)

Soon more 500 TB of disk for the various caches of the centre

DESCRIPTION OF THE CENTRE

NETWORK



Connection between
Poland and France
through GEANT Network
(academic European network)

2x10 Gbps links
between Poland and France

THE PLACE TAKEN BY HESS

80 % of the power of the centre is planned to be devoted to LHC experiments (computing and storage) the 20% remaining for all other experiments nuclear, particle and astroparticle physics

But, while awaiting LHC which is currently at 50%:
USE RESOURCES AVAILABLE !!

HESS uses :

4% of the computing power

all astro is 11%

16 GB of AFS throng_dir

max allowed per experiment

80 GB of AFS group_dir

1TB of “semiper”

/ 190 TB → 700 TB

110 TB are stored in hpss

/ 2.7 PB tapes, 80 TB cache

1.5 TB data are on xrootd

/ 300 TB

HOW TO BECOME A USER

Some foreign collaborators of experiments computing in the centre can have access to the centre (e.g. for HESS: two Germans), nominative accounts only.

For HESS you have to send a mail to the “Czar” espigat@in2p3.fr then you receive by mail a form that you must print, sign and fax to Pierre Espigat (for security reasons)

http://www.cc.in2p3.fr/cc_accueil.php3?lang=en

ORGANISATION

- Raw Data written on LTO2 tapes (200GB) in Namibia
(each run size is ~ 3GB)
- Once or twice a month one set shipped to France and one to Germany
- LTOs read and copied on hpss and temporarily
on “semiper” to accelerate corrections and calibration
- Calibration: results stored partly on AFS group_dir partly on DataBase

ORGANISATION

- DSTs (HAP, Model) produced, then stored on hpss and xrootd
(HAP DST size ~ 150 MB Model DST size ~200 MB)

Simulation

- shower files stored on hpss
- DST simulation files stored on hpss and xrootd

CONCLUSIONS

The Lyon calculation centre is a useful resource to

- Store large quantities of data, DSTs
- Centralize information (codes, databases...)
- Perform large batch processing jobs (if no glitches!)
 - Data analysis, production of DSTs
 - Shower simulations
 - Analysis/reconstruction of simulations
 - Production of tables used for analyses
(models, acceptances, resolutions)

Some members of the Polish groups who are or will be very actively involved in analysis/simulations should consider getting an account.