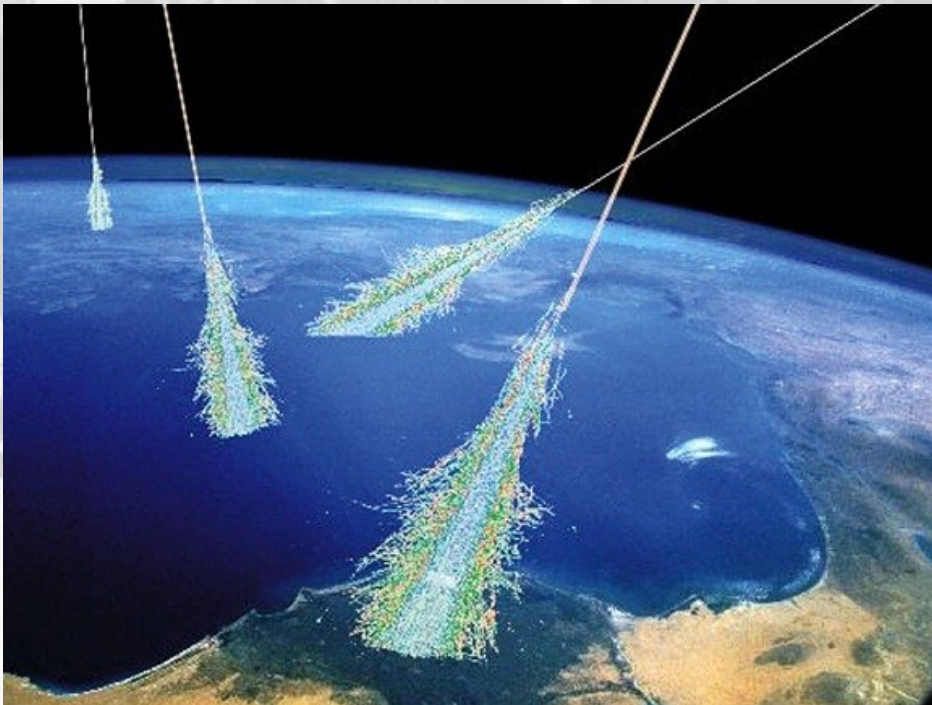


Mathieu de Naurois (+ de nombreuses contrib.)  
LLR - Ecole Polytechnique  
denauroi@in2p3.fr



- *Contexte*
- *Outils*
- *Ressources*
- *Performances*
- *Perspectives*



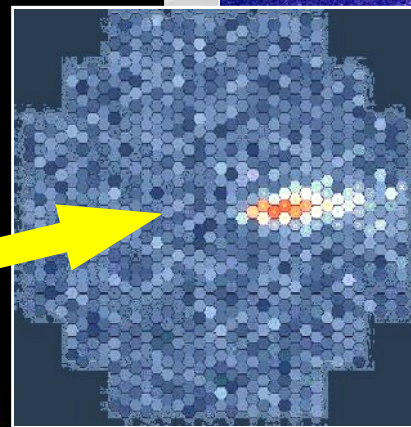
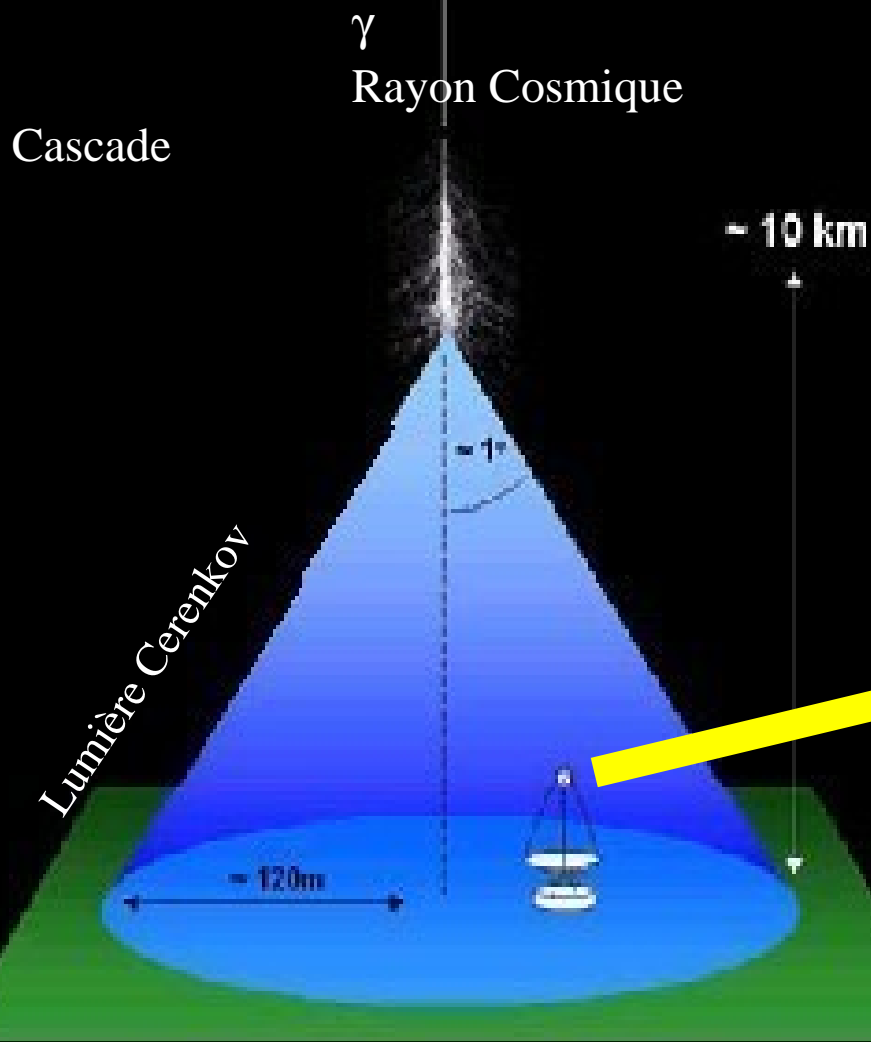
# Contexte

---

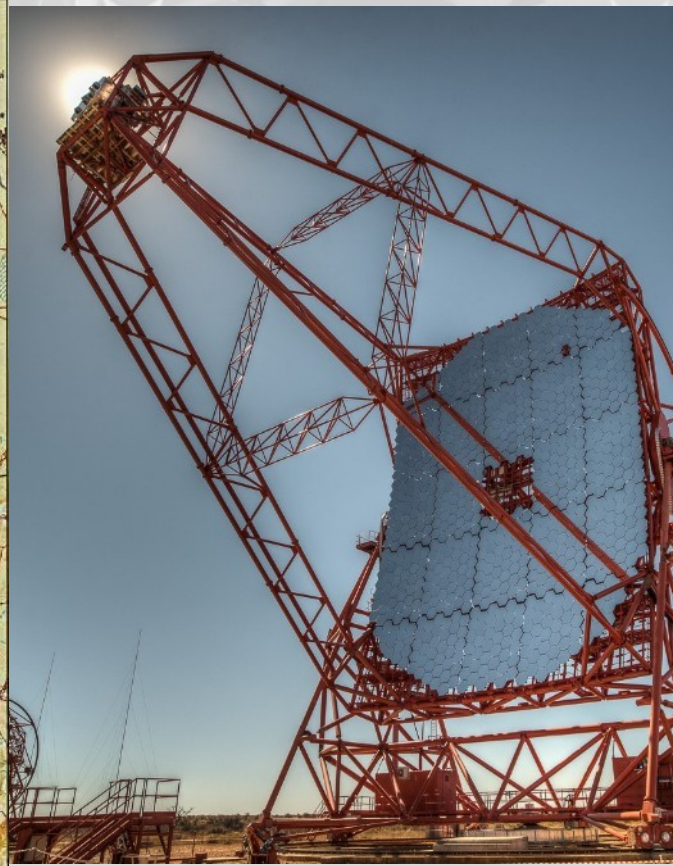
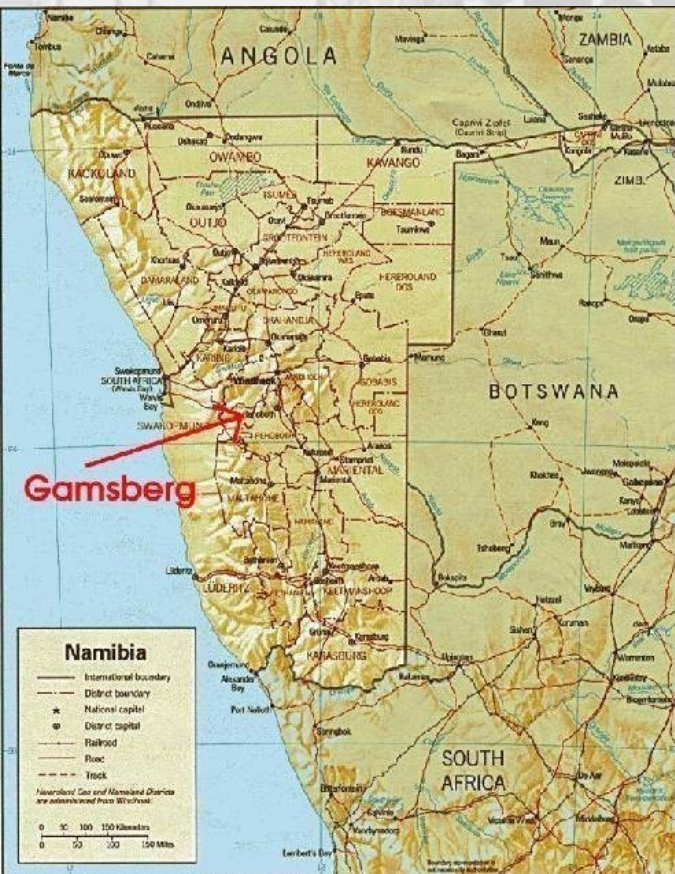


*Mathieu de Naurois*

## Sky & Telescope



- Consortium international, mené par Allemagne + France
- 4 télescopes de 14m + 1 télescope de 28m au centre du réseau
- Site:  $23^{\circ}16'' S$ ,  $16^{\circ}30'' E$ , 1800 m asl, 100 km de Windhoek (Namibie)
  - très bonne qualité optique du ciel
  - hémisphère peu observé, grande partie du plan galactique observable

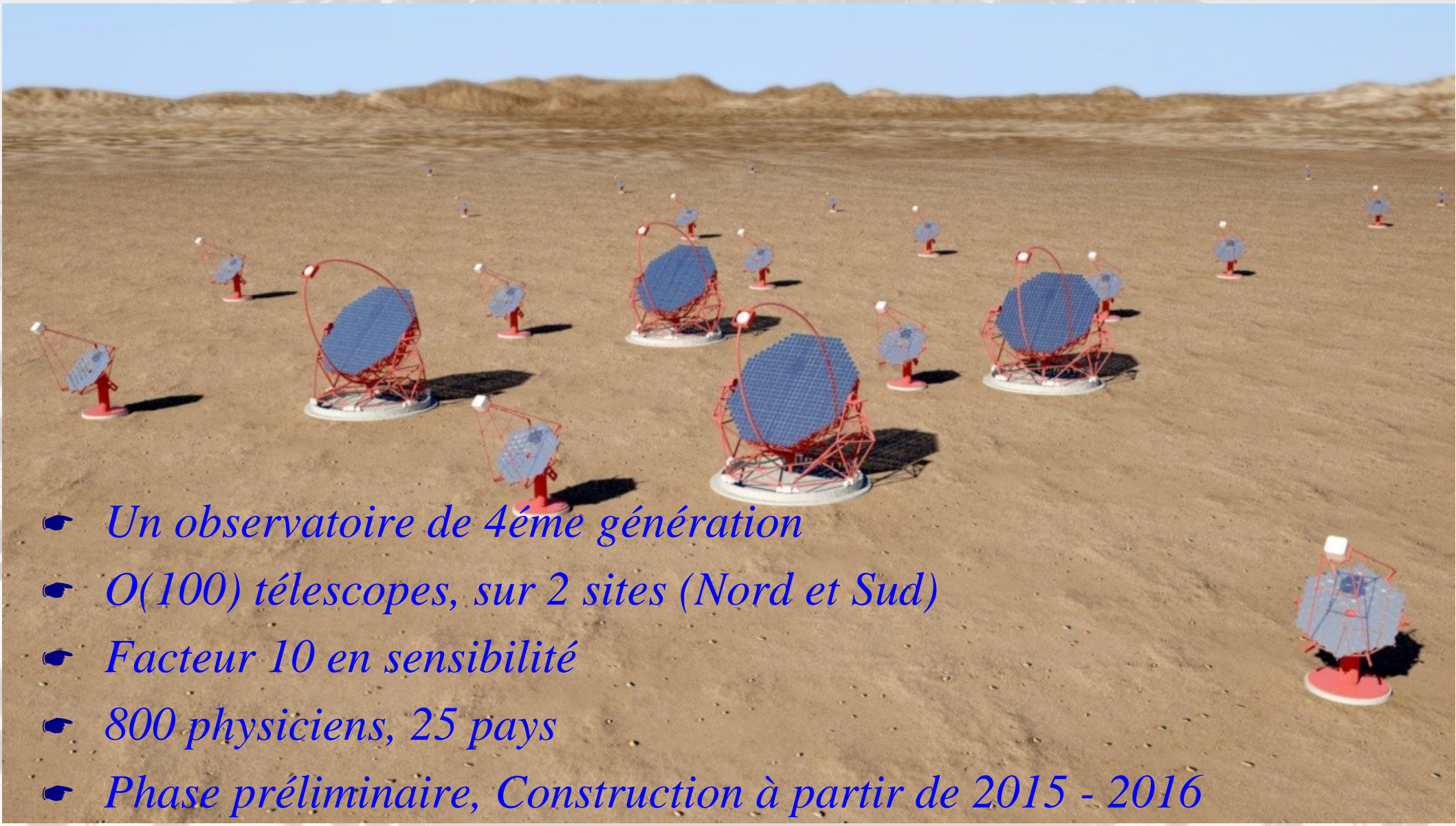


MPI Kernphysik, Heidelberg  
 Humboldt Univ. Berlin  
 Ruhr-Univ. Bochum  
 Univ. Hamburg  
 Landessternwarte Heidelberg  
 Ecole Polytechnique, Palaiseau  
 APC Paris  
 LPNHE Univ. Paris VI-VII  
 CEA Saclay  
 CESR Toulouse  
 LPTA Montpellier  
 LAOG Grenoble  
 LAPP Anecy  
 Observatoire de Paris  
 Durham Univ.  
 Dublin Inst. for Adv. Studies  
 Charles Univ., Prag  
 Yerevan Physics Inst.  
 North-West Univ., Potchefstroom  
 Univ. of Namibia, Windhoek

- *~ 1000 h d'observation par an*
- *10 GB → 100 GB / heure*
- *~ 400 TB d'archive à Lyon*
- *Traitement majoritairement effectué au CCIN2P3, ~ 150 coeurs en permanence*
- *Quelques % de la capacité totale de Lyon*

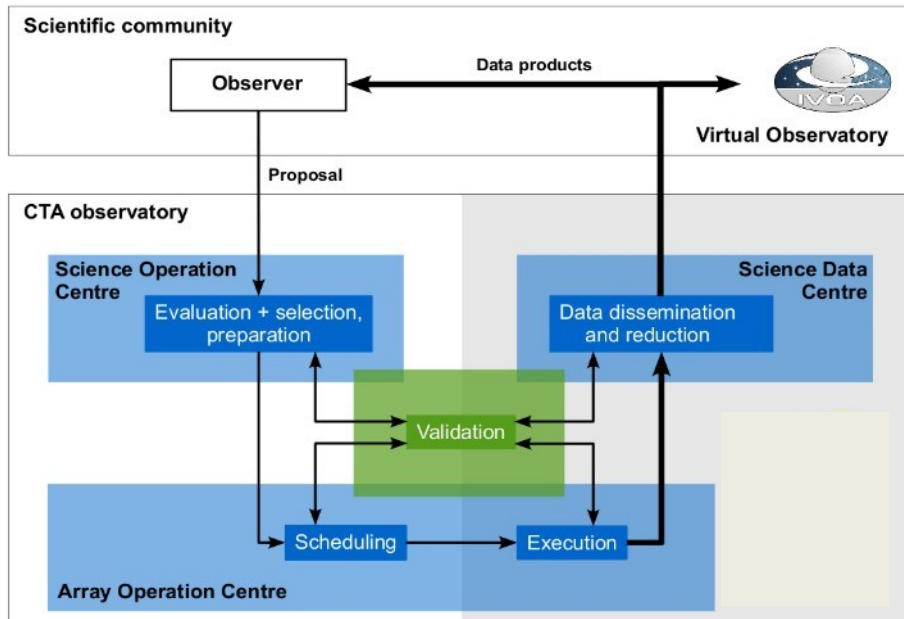


## CTA - Cherenkov Telescope Array

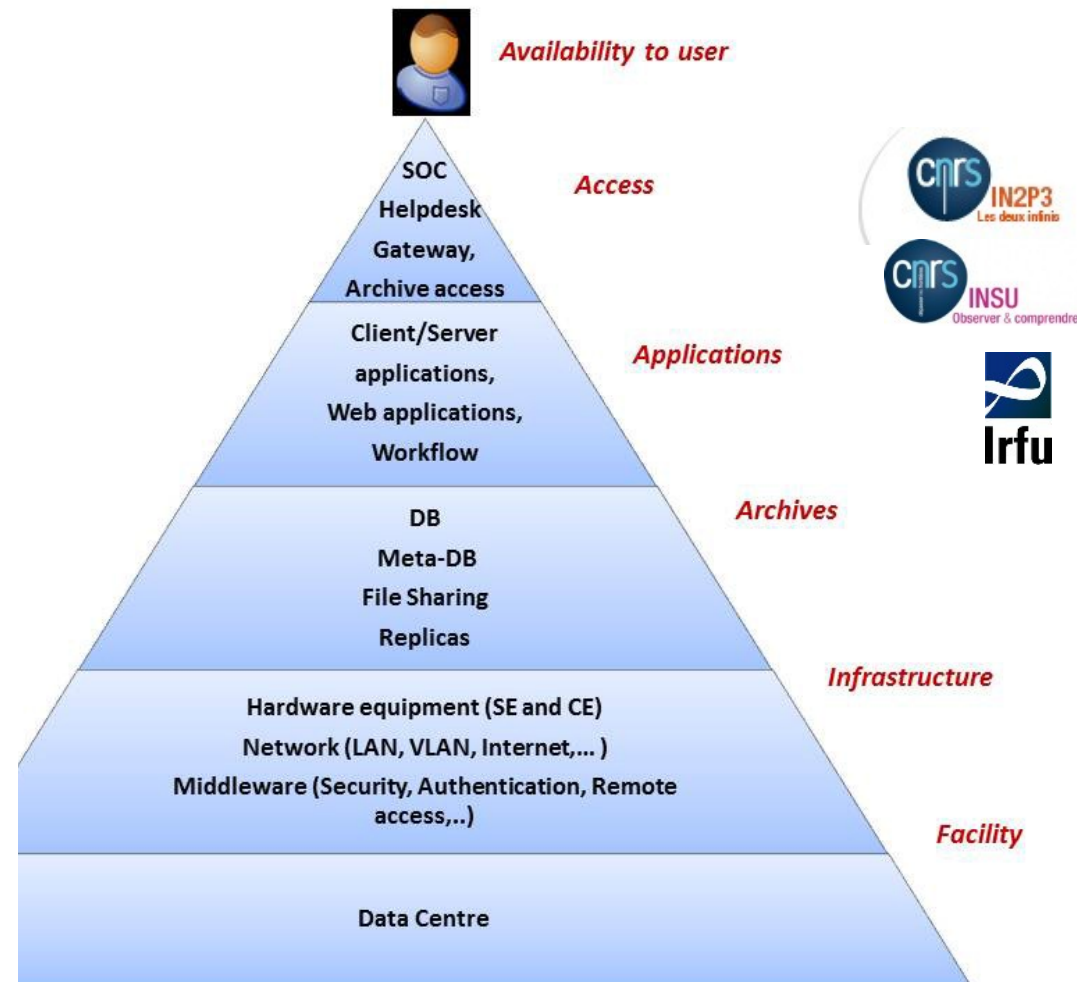


- *Un observatoire de 4<sup>ème</sup> génération*
- *O(100) télescopes, sur 2 sites (Nord et Sud)*
- *Facteur 10 en sensibilité*
- *800 physiciens, 25 pays*
- *Phase préliminaire, Construction à partir de 2015 - 2016*

- Accès ouvert (partiellement) aux données
- Outils de haut niveau, standards astrophysiques, communauté mondiale
- Volume de données : PB/an (Taux 0.4 - 5.3 GB/s)
- ~ 1000 cœurs à plein temps ou 10 000 à 10 % de temps (intermittence)



maintien de données,



LLR



# Outils

---





- *Développement d'un middleware propriétaire en python*
  - *Gestion des systèmes de batch : Grid Engine, Grid (glite), Sun, Unix Batch, ... permettant d'utiliser des ressources hétérogènes*
  - *Interfacé sur glite*
  - *Gestion des accès aux fichiers : HPSS, DISK, XROOTD, SSH, SRM, LFC, ...*
  - *Intégré aux logiciels HESS et à leurs interfaces graphique (pour une configuration plus aisée)*
  - *Implémentation récente des catalogues LFC*
- *Base de données mysql (bookkeeping) + interface php*

## Configuration au CCIN2P3

ParisAnalysis Interface (sur ccage010)

[Web page](#)

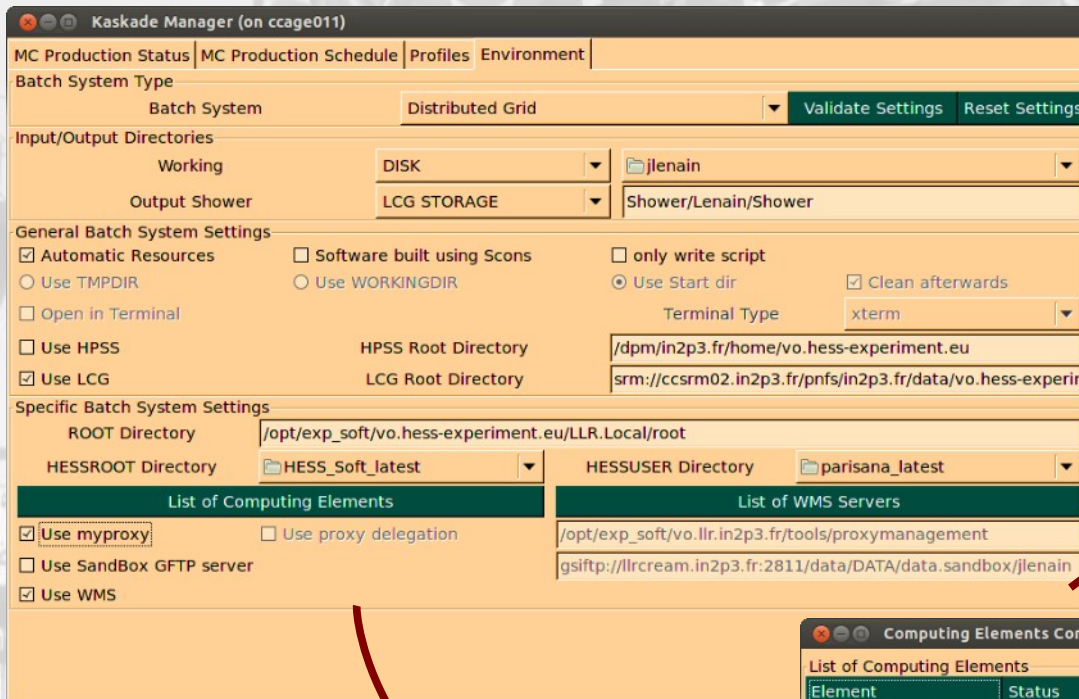
Target and Run List	Batch System Type		<input type="button" value="Validate Settings"/> <input type="button" value="Reset Settings"/>	
Excluded Regions	Batch System		Lyon	
Reconstruction	Input/Output Directories			
Event Selection	Working	DISK	Logs	
TMVA	Calibration	DISK	Calibration	
Micro DST	DST	XROOTD	DST	
Background Subtraction	Tables	DISK	HESS_Soft_0-8-24_Prod26	Type of storage to be used
Plots	Output Tables	DISK	denauroi	
MC	Results	DISK	Results_Prod26_0-8-24	
Fancy MC	General Batch System Settings			
Scaled Tables	<input checked="" type="checkbox"/> Automatic Resources	<input type="checkbox"/> Software built using Scons	<input type="checkbox"/> only write script	
3D Model Calibration	<input checked="" type="radio"/> Use TMPDIR	<input type="radio"/> Use WORKINGDIR	<input type="radio"/> Use Start dir	<input type="checkbox"/> Clean afterwards
Spectrum Tables	<input type="checkbox"/> Open in Terminal	Terminal Type		xterm
Morphology Tables	<input type="checkbox"/> Use ssh	<input type="checkbox"/> Using sshfs	Submit Host	
Tables Merging	<input type="checkbox"/> Use HPSS	HPSS Root Directory	cchpsshess://hpss/in2p3.fr/group/hess	
Spectrum	<input checked="" type="checkbox"/> Use XROOTD	<input type="checkbox"/> Clear XROOTD	XROOTD Root Directory	root://ccxroot:1999//hpss
Morphology	<input type="checkbox"/> Use LCG	LCG Root Directory		
Merging	<input type="checkbox"/> Use LFC			
Output	Specific Batch System Settings			
DST	Queue Name	long	Project Name	AUTO
Profiles	Duration	86400	Priority	0
Environment	Memory (MB)	2400	Disk Space (MB)	2500
	Allowed platforms	sl5 sl6	HESSROOT Directory	HESS_Soft_0-8-24
	ParisAnalysis Settings			
	<input type="checkbox"/> Verbose Analysis	<input type="checkbox"/> Produce Run Files		
	<input checked="" type="checkbox"/> Use sliced analysis	Runs per Slice:		20

## Configuration sur EGI

Terminal  
ParisAnalysis Interface (sur polui01.in2p3.fr) [Web page](#)

Target and Run List	Batch System Type	
Excluded Regions	Batch System	Distributed Grid <span>Validate Settings</span> <span>Reset Settings</span>
Reconstruction	Input/Output Directories	
Event Selection	Working	DISK <span>denaurois</span>
TMVA	Calibration	XROOTD <span>Calibration</span>
Micro DST	DST	LCG STORAGE <span>DST</span>
Background Subtraction	Tables	DISK <span>denaurois</span>
Plots	Output Tables	DISK <span>denaurois</span>
MC	Results	DISK <span>denaurois</span>
Fancy MC	General Batch System Settings	
Scaled Tables	<input checked="" type="checkbox"/> Automatic Resources	<input type="checkbox"/> Software built using Scons
3D Model Calibration	<input type="checkbox"/> Use TMPDIR	<input type="checkbox"/> Use WORKINGDIR
Spectrum Tables	<input type="checkbox"/> Open in Terminal	<input type="checkbox"/> only write script
Morphology Tables	<input type="checkbox"/> Use HPSS	<input checked="" type="radio"/> Use Start dir <span>Clean afterwards</span>
Tables Merging	HPSS Root Directory	Terminal Type <span>xterm</span>
Spectrum	<input checked="" type="checkbox"/> Use XROOTD	XROOTD Root Directory <span>root://polgrid4.in2p3.fr/c</span>
Morphology	<input type="checkbox"/> Clear XROOTD	LCG Root Directory <span>srm://ccsrm02.in2p3.fr/pnfs/in2p3.fr/data/vo.hess-ex</span>
Merging	<input checked="" type="checkbox"/> Use LCG	
Output	Specific Batch System Settings	
DST	ROOT Directory	<span>/opt/exp_soft/vo.hess-experiment.eu/LLR.Local/root</span>
Profiles	HESROOT Directory	<span>hess</span> <span>HESUSER Directory</span> <span>hess</span>
Environment	<span>List of Computing Elements</span> <span>List of WMS Servers</span>	
	<input type="checkbox"/> Use myproxy	<input checked="" type="checkbox"/> Use proxy delegation <span>/opt/exp_soft/vo.llr.in2p3.fr/tools/proxymanagement</span>
	<input checked="" type="checkbox"/> Use SandBox GFTP server	<span>gsiftp://llcream.in2p3.fr:2811/data/DATA/data.sandbox/de</span>
	<input type="checkbox"/> Use WMS	
	ParisAnalysis Settings	
	<input type="checkbox"/> Verbose Analysis	<input type="checkbox"/> Produce Run Files
	<input type="checkbox"/> Use sliced analysis	Runs per Slice: <span>20</span>

- *Soumission via WMS ou directement sur CE.*
- *Interfacage avec les outils glite*



Kaskade Manager (on ccage011)

MC Production Status | MC Production Schedule | Profiles | Environment

Batch System Type

Batch System: Distributed Grid [Validate Settings] [Reset Settings]

Input/Output Directories

Working: DISK [jlenain]

Output Shower: LCG STORAGE [Shower/Lenain/Shower]

General Batch System Settings

Automatic Resources  Software built using Scons  only write script

Use TMPDIR  Use WORKINGDIR  Use Start dir  Clean afterwards

Open in Terminal Terminal Type: xterm

Use HPSS HPSS Root Directory: /dpm/in2p3.fr/home/vo.hess-experiment.eu

Use LCG LCG Root Directory: srm://ccsrm02.in2p3.fr/pnfs/in2p3.fr/data/vo.hess-experir

Specific Batch System Settings

ROOT Directory: /opt/exp\_soft/vo.hess-experiment.eu/LLR.Local/root

HESSROOT Directory: HESS\_Soft\_latest HESSUSER Directory: parisana\_latest

List of Computing Elements

Use myproxy  Use proxy delegation

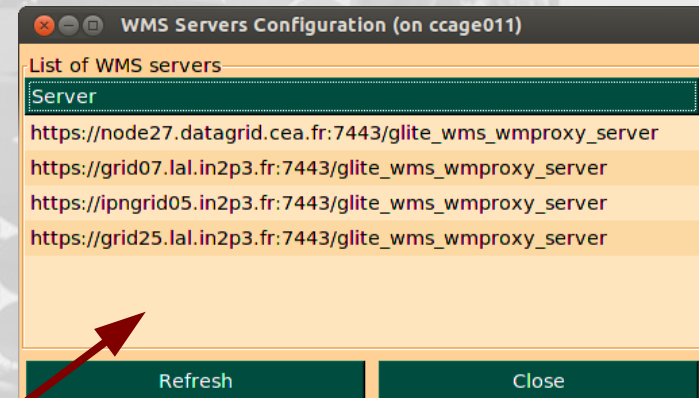
Use Sandbox GFTP server

Use WMS

List of WMS Servers

/opt/exp\_soft/vo.llr.in2p3.fr/tools/proxymanagement

gsiftp://llrcream.in2p3.fr:2811/data/DATA/data.sandbox/jlenain



WMS Servers Configuration (on ccage011)

List of WMS servers

Server

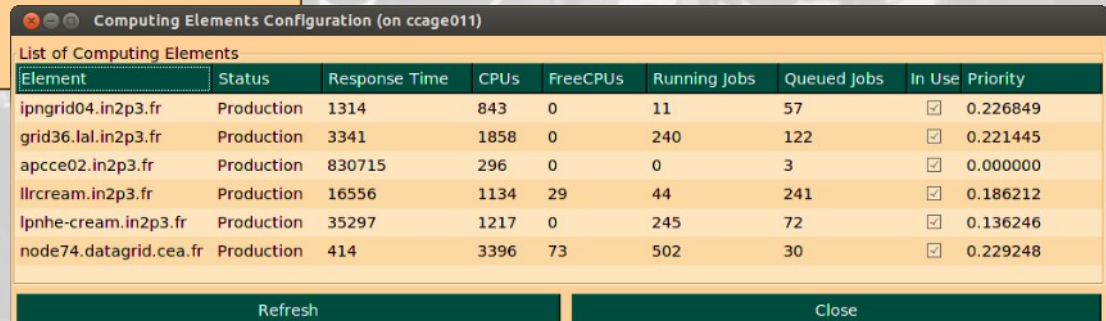
https://node27.datagrid.cea.fr:7443/glite\_wms\_wmproxy\_server

https://grid07.lal.in2p3.fr:7443/glite\_wms\_wmproxy\_server

https://ipngrid05.in2p3.fr:7443/glite\_wms\_wmproxy\_server

https://grid25.lal.in2p3.fr:7443/glite\_wms\_wmproxy\_server

[Refresh] [Close]



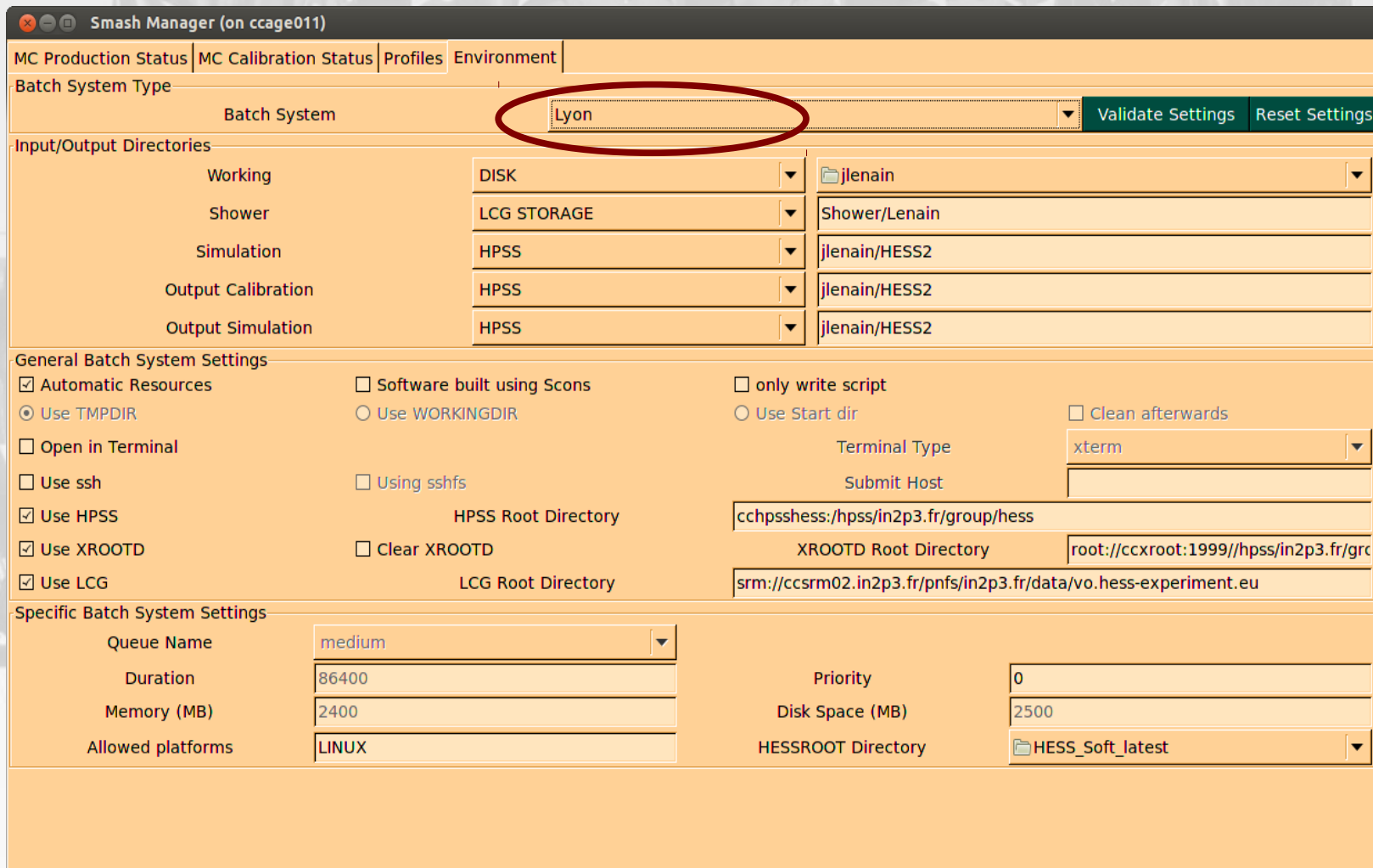
Computing Elements Configuration (on ccage011)

List of Computing Elements

Element	Status	Response Time	CPUs	FreeCPUs	Running Jobs	Queued Jobs	In Use	Priority
ipngrid04.in2p3.fr	Production	1314	843	0	11	57	<input checked="" type="checkbox"/>	0.226849
grid36.lal.in2p3.fr	Production	3341	1858	0	240	122	<input checked="" type="checkbox"/>	0.221445
apcce02.in2p3.fr	Production	830715	296	0	0	3	<input checked="" type="checkbox"/>	0.000000
llrcream.in2p3.fr	Production	16556	1134	29	44	241	<input checked="" type="checkbox"/>	0.186212
lpnhe-cream.in2p3.fr	Production	35297	1217	0	245	72	<input checked="" type="checkbox"/>	0.136246
node74.datagrid.cea.fr	Production	414	3396	73	502	30	<input checked="" type="checkbox"/>	0.229248

[Refresh] [Close]

- Utilisation de fichiers générés sur la grille depuis un job batch à Lyon:



The screenshot shows the 'Smash Manager (on ccage011)' interface. The 'Environment' tab is active, and the 'Batch System' dropdown is set to 'Lyon'. The 'Input/Output Directories' section is highlighted with a red arrow, showing the following settings:

Category	Storage	Directory
Working	DISK	jlenain
Shower	LCG STORAGE	Shower/Lenain
Simulation	HPSS	jlenain/HESS2
Output Calibration	HPSS	jlenain/HESS2
Output Simulation	HPSS	jlenain/HESS2

The 'General Batch System Settings' section includes various checkboxes and fields:

- Automatic Resources
- Software built using Scons
- only write script
- Use TMPDIR
- Use WORKINGDIR
- Use Start dir
- Clean afterwards
- Open in Terminal
- Terminal Type: xterm
- Use ssh
- Using sshfs
- Submit Host: [empty]
- Use HPSS
- HPSS Root Directory: cchpsshess:/hpss/in2p3.fr/group/hess
- Use XROOTD
- Clear XROOTD
- XROOTD Root Directory: root://ccxroot:1999//hpss/in2p3.fr/grc
- Use LCG
- LCG Root Directory: srm://ccsrm02.in2p3.fr/pnfs/in2p3.fr/data/vo.hess-experiment.eu

The 'Specific Batch System Settings' section includes:

- Queue Name: medium
- Duration: 86400
- Memory (MB): 2400
- Allowed platforms: LINUX
- Priority: 0
- Disk Space (MB): 2500
- HESSROOT Directory: HESS\_Soft\_latest

Simulation Shower Productions - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Cacti Simulation Shower Product... GStat 2.0

lphess.in2p3.fr/~denauroi/protected/hessphp/showusershowerprods.php?User=Lenain

Smart Bookmarks Biblio LPNHE CNRS CTA H.E.S.S. HE analysis EGI Articles Perso Reverso

**Main page**

**Data**  
HPSS Run Status  
Run Information

**Analysis**  
DST Status  
Run Lists

**Calibration**  
Run Status  
Periods Status  
Muon Efficiency  
Gain History  
Sticky bit runs  
Orphaned Events Statistics  
Common Mode Statistics  
Orphaned Events Correlations  
GPS offset runs  
Runs with GPS problems  
Corrected runs

**Simulation**  
Shower Simulations (Production)  
Detector Simulation (Production)  
Shower Simulations (User)  
Detector Simulations (User)  
DST Status

**Astro**  
Target Info  
Source Catalogs

**Shifts**  
Observation Periods  
Institutions Statistics  
Per Shifter Statistics  
Per Institution Statistics

**SAM Production Tests**  
Tested Chips Number  
Broken Chips Number  
Power  
DST Calibration

**Shower Productions [Lenain]**

User Name :

Production	Type	Description	Code Name	Code Version	Primary	KaskadeConfig	Site	TelescopeLayout
eDiffuseSpectrum_paris_0-8-24	PRODUCTION	Massive diffuse electron simulations for HESS II	kaskade_c++	paris-0-8-24	3	Default	Namibia	HESSPhase2
gSpectrum_paris_0-8-24	PRODUCTION	Massive gamma simulations for HESS II	kaskade_c++	paris-0-8-24	1	Default	Namibia	HESSPhase2
pSpectrum_paris_0-8-24	PRODUCTION	Massive proton simulations for HESS II	kaskade_c++	paris-0-8-24	13	Default	Namibia	HESSPhase2
eSpectrum_paris_0-8-20-2	TEST	Diffuse Electron simulations for HESS II	kaskade_c++	paris-0-8-20-2	3	Default	Namibia	HESSPhase2
gSpectrumLowE_paris_0-8-20-2	TEST	Low E gamma for HESS 2	kaskade_c++	paris-0-8-20-2	1	Default	Namibia	HESSPhase2
gSpectrumLowE_ZA18_paris_0-8-20-2	TEST	photons at low E with ZA 18 deg for HESS 2 on EGI	kaskade_c++	paris-0-8-20-2	1	Default	Namibia	HESSPhase2
gSpectrum_paris_0-8-20-2	TEST	Gamma simulations for HESS II	kaskade_c++	paris-0-8-20-2	1	Default	Namibia	HESSPhase2
gSpectrum_testEmin	TEST	g spectrum tests with different E min	kaskade_c++	paris-0-8-24	1	Default	Namibia	HESSPhase2
pSpectrum_paris_0-8-20-2	TEST	Proton simulations for HESS II	kaskade_c++	paris-0-8-20-2	13	Default	Namibia	HESSPhase2
TestHESS2_longProtons	TEST	Test long proton runs on EGI	kaskade_c++	paris-0-8-20-2	13	Default	Namibia	HESSPhase2

Zenith	Azimuth	Power Law Index	Emin	Emax	Rhomin	Rhymax	Req. # Showers	Status	Produced. # Showers	# jobs	
60	180	1	0.01	200	0	1200	200000000	DONE	200005840	2902	<a href="#">details</a>
57	180	1	0.00918039	183.608	0	1102	200000000	DONE	200031984	3216	<a href="#">details</a>
53	180	1	0.0083082	166.164	0	997	200000000	DONE	200016625	3625	<a href="#">details</a>
50	180	1	0.00777862	155.572	0	933	200000000	DONE	200010232	3923	<a href="#">details</a>
46	180	1	0.00719778	143.956	0	864	200000000	DONE	200013700	4306	<a href="#">details</a>
41	180	1	0.00662507	132.501	0	795	200000000	DONE	200036607	4757	<a href="#">details</a>
37	180	1	0.00626068	125.214	0	751	200000000	DONE	200030481	5091	<a href="#">details</a>
32	180	1	0.00589589	117.918	0	708	200000000	DONE	200019760	5471	<a href="#">details</a>
26	180	1	0.00556301	111.26	0	668	200000000	DONE	200013002	5866	<a href="#">details</a>
18	180	1	0.00525731	105.146	0	631	200000000	DONE	200023358	6278	<a href="#">details</a>
0	180	1	0.005	100	0	600	200000000	DONE	200003333	6667	<a href="#">details</a>
63	180	1	0.0110134	220.269	0	1322	200000000	DONE	200040225	2585	<a href="#">details</a>
67	180	1	0.0127965	255.93	0	1536	200000000	DONE	200037827	2159	<a href="#">details</a>
70	180	1	0.014619	292.38	0	1754	200000000	SUBMITTED	196429935	1807	<a href="#">details</a>

- *CTA évalue depuis 2011 le framework DIRAC, développé originellement pour LHCb*
  - *Installation spécifique (dirac0x.pic.es + CCIN2P3), gère la soumission des jobs et le monitoring, (python API), redondance, load management & fault tolerance*
  - *Book-keeping des jobs (Web portal), ...*
  - *Catalogue de fichiers*



Chrome File Edit View History Bookmarks Window Help 73°C 3765rpm (0:59) May 16 7:00 PM

Google LCG.Bri Plot view WMS his 200682 Lemon IMG elen SLS Service Lemon Jobs mor

https://dirac01.pic.es/DIRAC/CTA/dirac\_admin/jobs/JobMonitor/display

Apple Yahoo! Google Maps YouTube Wikipedia News Popular Views Personal DIRAC CTA Other Bookmarks

Systems Jobs Help Tools Selected setup: CTA

**JobMonitoring** Reschedule Kill Delete

Select All Select None

JobId	Status	MinorStatus	ApplicationStatus	Site	JobName	LastUpdate [UTC]	LastSignOfLife [...]	SubmissionTim...	Owner
<input type="checkbox"/> 54423	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:26	dirac
<input type="checkbox"/> 54422	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:21	2011-05-16 11:21	2011-05-16 10:26	dirac
<input type="checkbox"/> 54421	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:26	dirac
<input type="checkbox"/> 54420	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:26	dirac
<input type="checkbox"/> 54419	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:26	dirac
<input type="checkbox"/> 54418	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:26	dirac
<input type="checkbox"/> 54417	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:25	dirac
<input type="checkbox"/> 54416	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:25	dirac
<input type="checkbox"/> 54415	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:25	dirac
<input type="checkbox"/> 54414	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:20	2011-05-16 11:20	2011-05-16 10:25	dirac
<input type="checkbox"/> 54413	Done	Execution Com...	Unknown	LCG.LAPP.fr	Test2	2011-05-16 11:18	2011-05-16 11:18	2011-05-16 10:25	dirac
<input type="checkbox"/> 54412	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 11:21	2011-05-16 11:21	2011-05-16 10:25	dirac
<input type="checkbox"/> 54411	Done	Execution Com...	Unknown	LCG.PIC.es	Test2	2011-05-16 10:41	2011-05-16 10:41	2011-05-16 10:25	dirac
<input type="checkbox"/> 54410	Done	Execution Com...	Unknown	LCG.LAPP.fr	Test2	2011-05-16 11:19	2011-05-16 11:19	2011-05-16 10:25	dirac
<input type="checkbox"/> 54409	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 10:34	2011-05-16 10:34	2011-05-16 10:25	dirac
<input type="checkbox"/> 54408	Done	Execution Com...	Unknown	LCG.PIC.es	Test2	2011-05-16 10:41	2011-05-16 10:41	2011-05-16 10:25	dirac
<input type="checkbox"/> 54407	Done	Execution Com...	Unknown	LCG.LAPP.fr	Test2	2011-05-16 11:19	2011-05-16 11:19	2011-05-16 10:25	dirac
<input type="checkbox"/> 54406	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 10:34	2011-05-16 10:34	2011-05-16 10:25	dirac
<input type="checkbox"/> 54405	Done	Execution Com...	Unknown	LCG.PIC.es	Test2	2011-05-16 10:41	2011-05-16 10:41	2011-05-16 10:25	dirac
<input type="checkbox"/> 54404	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 10:33	2011-05-16 10:33	2011-05-16 10:25	dirac
<input type="checkbox"/> 54403	Done	Execution Com...	Unknown	LCG.IN2P3-CC.fr	Test2	2011-05-16 10:34	2011-05-16 10:34	2011-05-16 10:25	dirac

Time Span: Select time span Start: YYYY-mm-dd 00:00 End: Now YYYY-mm-dd 00:00

Submit Reset

Global Sort Current Statistics Global Statistics

Page 1 of 2177 Items per page: 25

Displaying 1 - 25 of 54423

jobs > Job monitor ricardo@ dirac\_admin (/DC=es/DC=irisgrid/O=ecm-ub/CN=Ricardo-Graciani-Diaz)





# Ressources

---

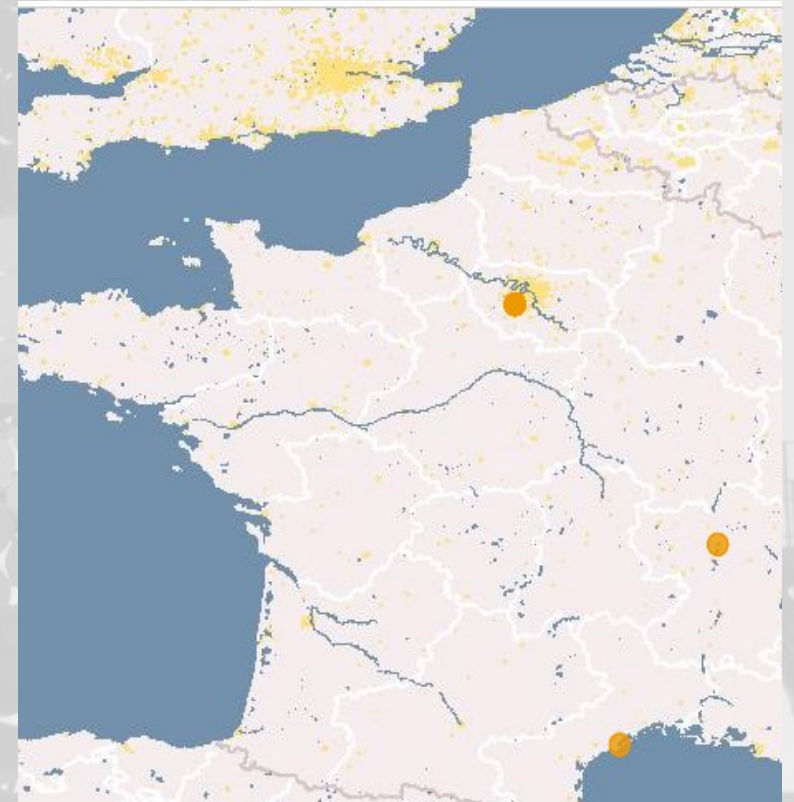


- *Computing Elements (CE):*

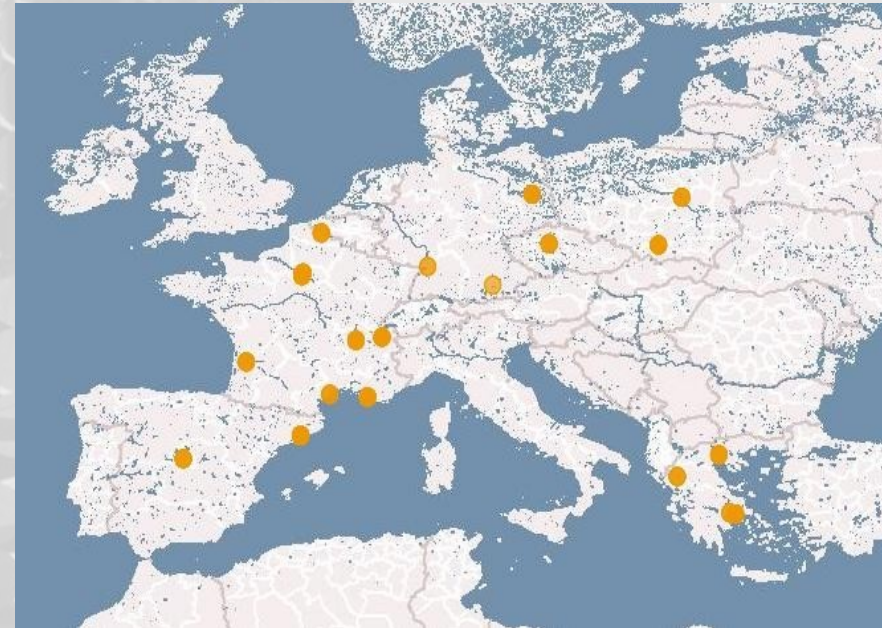
- *GRIF: APC, LLR, CEA, LPNHE, LAL, IPNO*
- *→ 9425 slots CPU, partagés entre VO.*
- *+ LUPM récemment*

- *Storage Elements (SE):*

- *GRIF (LAL, LLR): 100 TB*
- *CCIN2P3: 2.1 TB de cache (dCache), produits migrés automatiquement sur HPSS.*
- *→ Pratique pour utiliser produits grilles sur EGI et en batch depuis Lyon (transparent pour l'utilisateur) !!*



- 17 sites sur 6 pays (*vo.cta.in2p3.fr*)
- 18k CPUs, partagés avec d'autres VO's
  - 1000 – 2000 CPUs pour CTA
  - Stockage: plusieurs TB sur chaque site, ~500TB avec les bandes



	available CPUs	for CTA	proton simulations
IN2P3-LAPP	925	200	yes
IN2P3-CC	3992	200...600	yes
GRIF-IRFU	1472		no
GRIF-LAL	1229	200	yes
GRIF-APC	100	80	yes
GRIF-LLR	988		small jobs
GRIF-LPNHE	372		no
LPTA, Montpellier	104	100	small jobs
MPPMU	856		no
DESY-ZN	700	400	yes
UNI-DORTMUND	1832		no
PIC	2304	200	yes
CIEMAT-LCG2	0		no
CYFRONET-LCG2	3324	several 100	yes

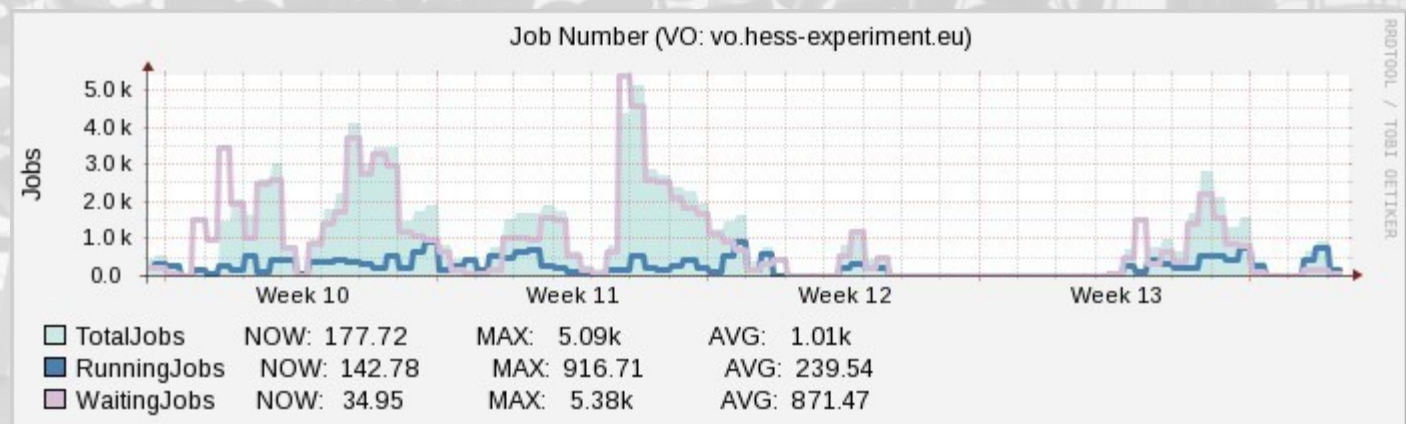
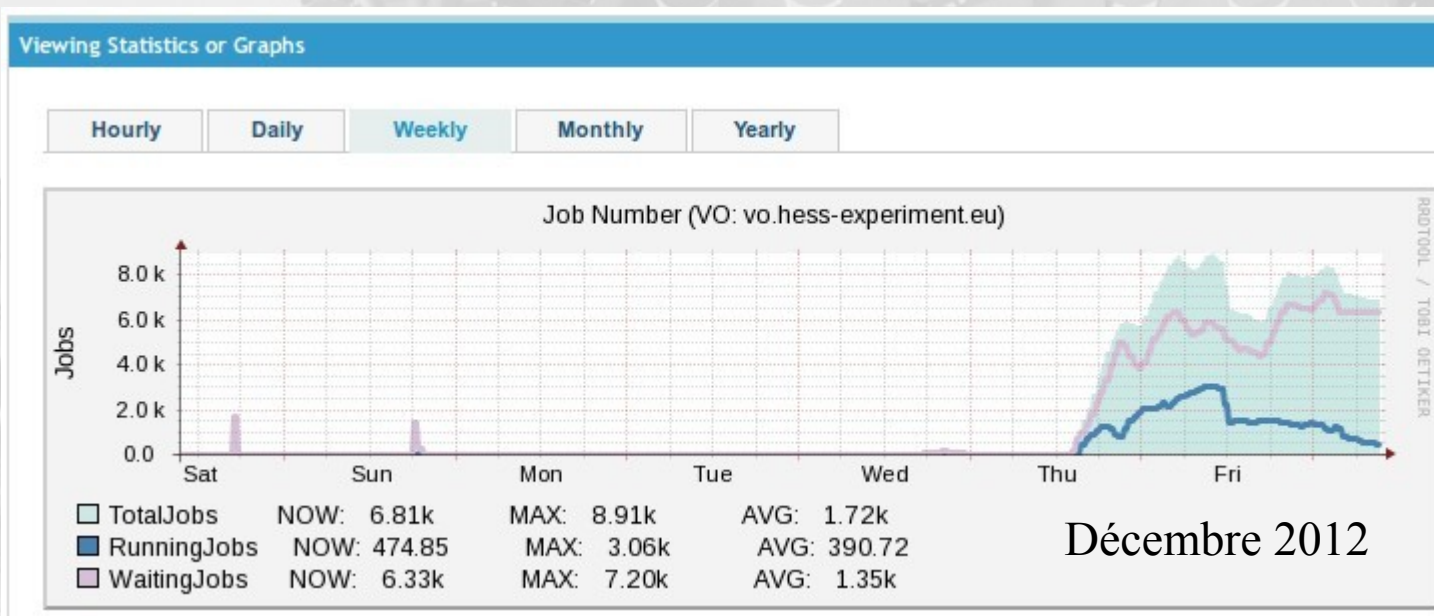


# Performances

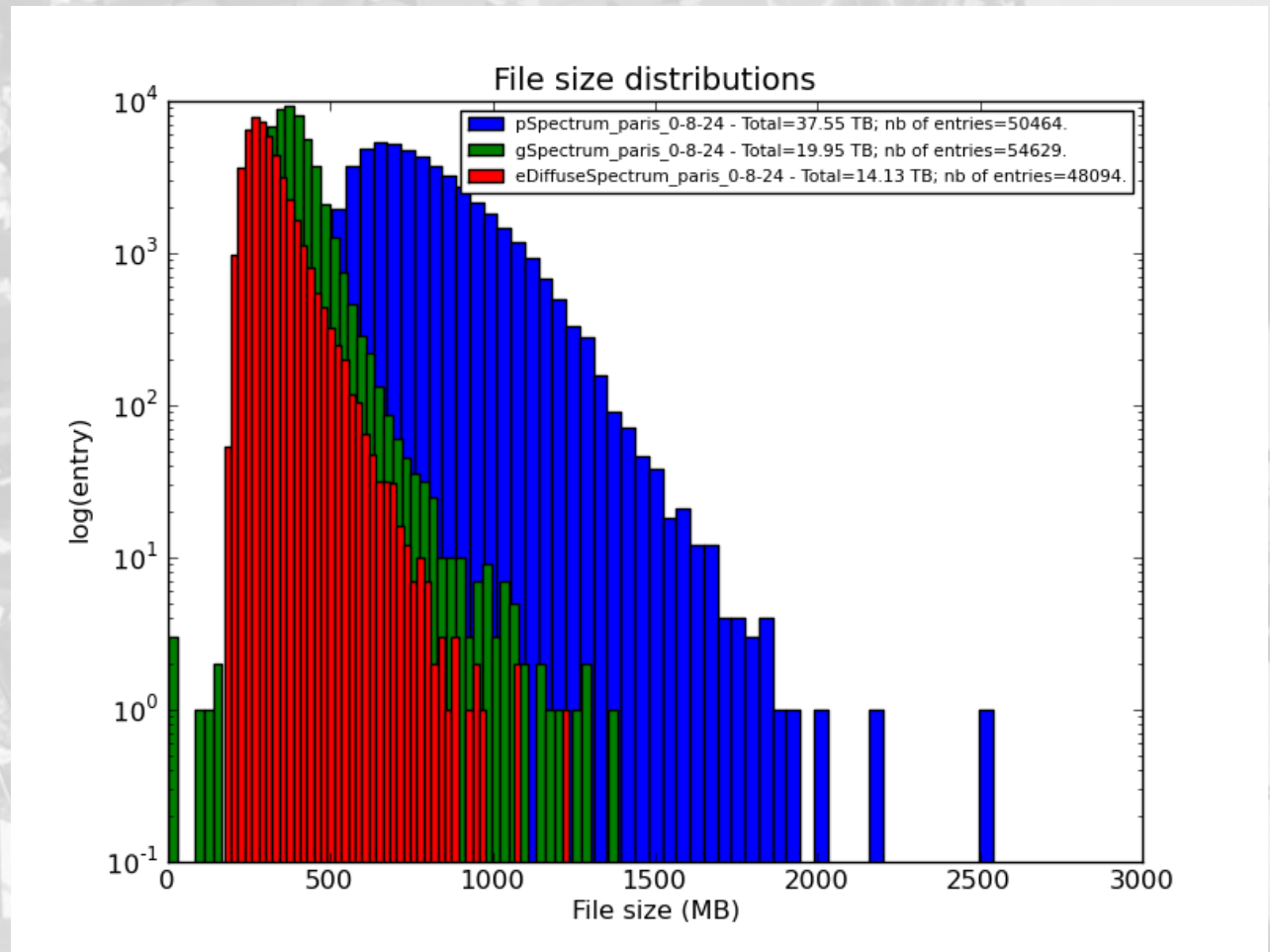
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- <http://gstat.egi.eu/gstat/vo/vo.hess-experiment.eu/>
- *Jusqu'à 3k jobs en pic, ~300–500 jobs en moyenne*

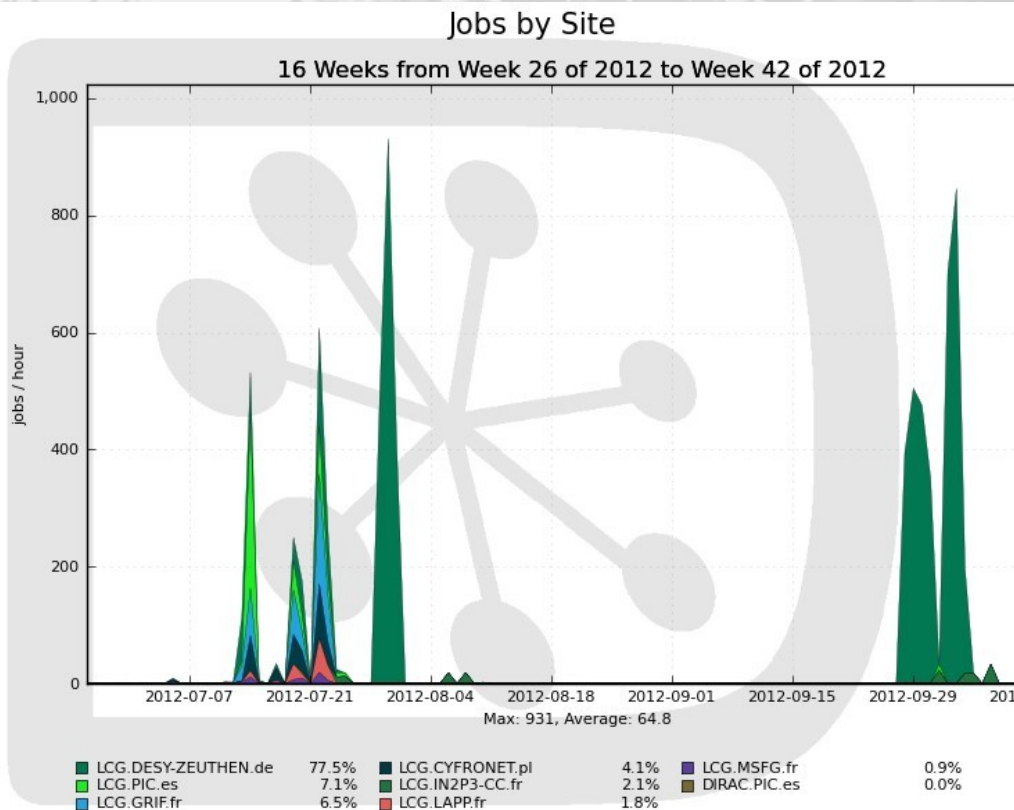


- *Distribution des fichiers (prod):*  
*En 1.5 mois (14/02/2013 → 04/04/2012):*  
*> 150.000 jobs*  
*~70 TB générés*

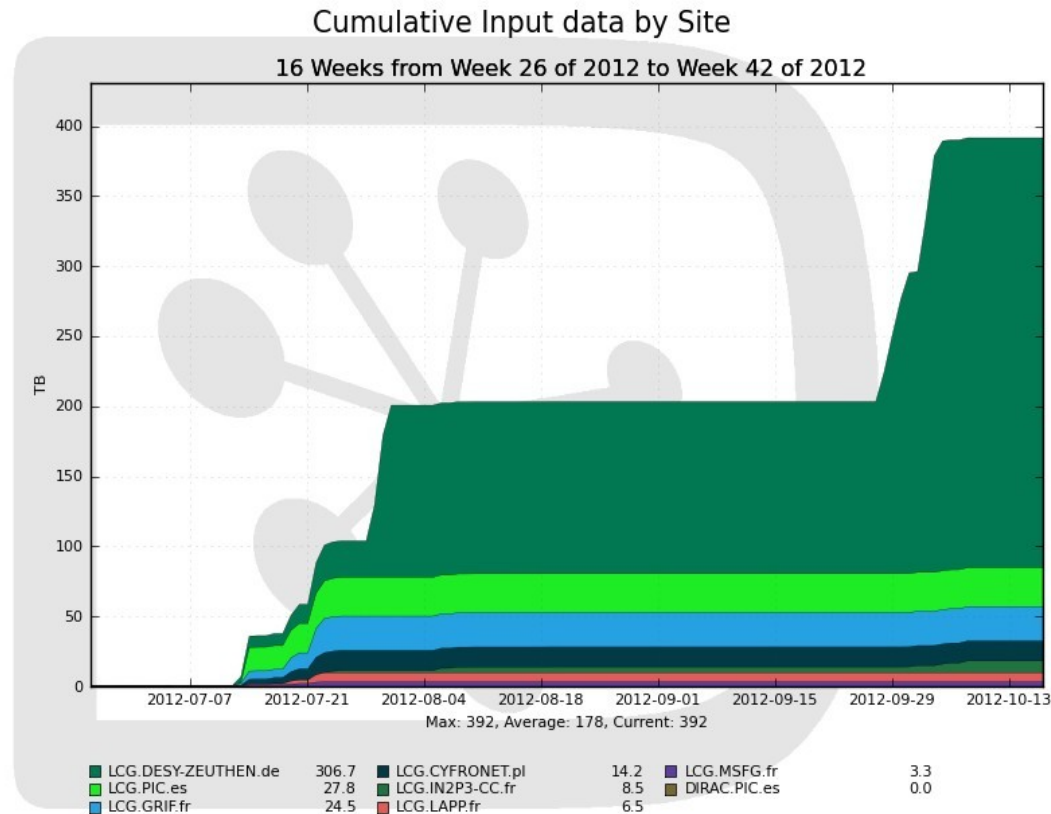


- *Premier retour d'expérience :*
  - *Simulation, reconstruction, analyse*
  - *Certaines tâches (simulation) relativement aisées*
  - *D'autres nécessitent de nombreuses étapes avec des fichiers intermédiaires => complique la tâche, de nombreux modules DIRAC interdépendants*

- *Test grandeur nature : réponse de l'instrument en fonction de la position de la source*
  - *4 semaines, 180 000 jobs, 97 % de taux de succès*
  - *400 TB processés*
  - *12 TB de données produites*



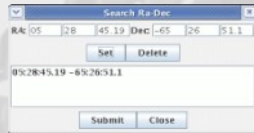
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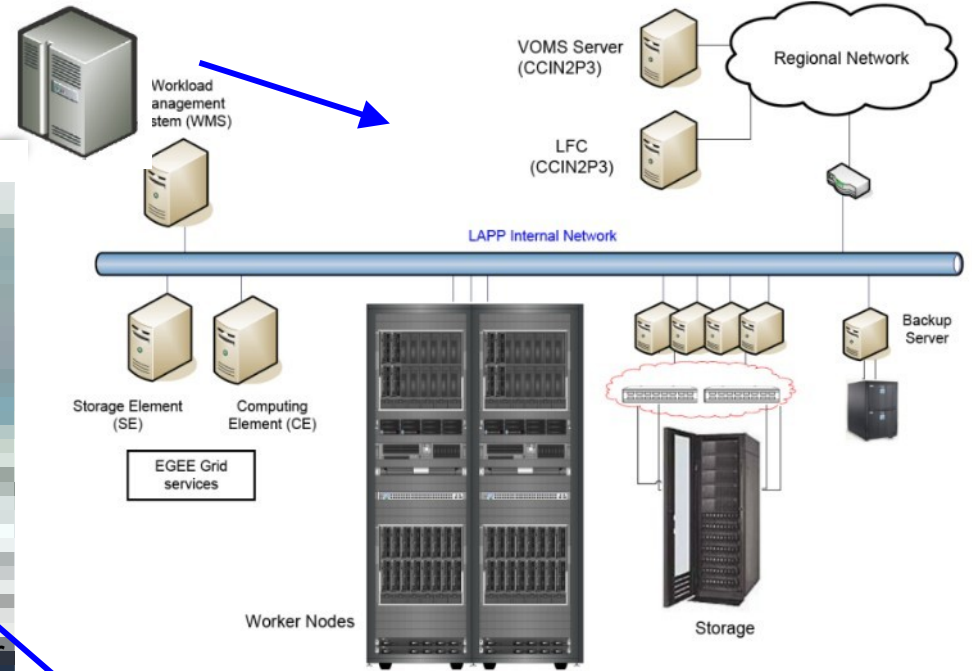
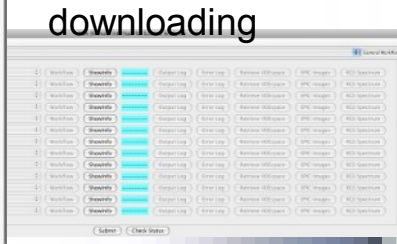
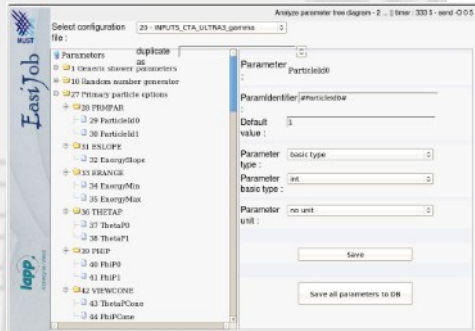
User Web Client and/or VM for data searching



Web Server workload management

Grid jobs management

Client application for analysis job submission and results info./ file downloading



downloading

High-level data request

FITS and VObs data access

Interface layer with archive DB

Science Archive, DB and MetaDB systems, notification and results uploading

FITS and VO compliant results  
VObs tools (VOSpec, Aladin)



# Conclusions

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- *Deux approches assez différentes :*
  - *HESS : middle-ware propriétaire, très intégré au soft HESS.*
    - Nettement plus simple pour l'utilisateur (GUI), gestion assez transparente
    - Mais un travail de développement plus lourd
  - *CTA : utilisation d'un middle-ware extérieur (DIRAC)*
    - Plus simple au niveau développement
    - Mais la complexité de certaines tâches rend l'utilisation des outils pas toujours aisée
- *Dans les deux cas, retour d'expérience très positif*
- *Le point le plus difficile reste la disponibilité des espaces de stockage*