



LAPP :Site report

LPNHE:18-19 Juin 2012

Overview

- Context
- Infrastructure report
- Site Hardware report
- Services report
- Activities report

Context

- **Laboratoire Annecy-le-vieux de Physique des Particules** (know as **IN2P3-LAPP** on LCG site namespace) is a IN2P3 French laboratory
 - LHC experiences : ATLAS and LHCb
 - Neutrino : Opera
 - Astro particles : HESS, CTA, Virgo, AMS
 - ILC,...
- Provide computing facilities and storage facilities for many laboratories of university.
 - Mathematics
 - Polymers structure
 - Theorical physics
 -

Context

- Same infrastructure provide computing and storage:
 - Grid Users (>85 % of computing resources used)
 - Atlas
 - LHCb
 - Earth science
 - Geant4
 - CTA
 -
 - LAPP Users
 - Local Atlas users
 - Local LHCb, Hess, Virgo,.... users
 - Services (electronics service, mechanics services)
 - University Users
 - Users from others laboratories of University

Infrastructure

- A computing room of 60 square meter.
- 2*56kW of cooling
 - Can survive with only one (true during winter, probably with a shutdown of a part on the Workers Node during summer)
- 2*72kW of power supply
 - 10 minutes with Worker Nodes up and running (But problem of cooling before)
 - ~1 hour if Worker Node are shutting down quickly.
- No generator of power
- A major update will be done before end of this year (tomorrow talk)

Computing hardware

- **HP Blade center (816 jobs slots)**
 - A choice done on 2008 (mainly because we had power consumption and density requirement)
 - A choice already present because blade management is very useful, and hardware is very robust.
- **Many generation of blade (server)**
 - Because processor evolution, memory capacity evolution and local disks evolution
 - Always Intel processor
- **Evolution of interconnect**
 - From 1Gb/s per server to Grid stack (via pass-through)
 - To switch with $N \times 10\text{G/s}$ capacity (to stack) directly inside the blade center
 - 2012 procurement including also Infiniband connection (requirement from local user) directly on blade center.

Storage hardware

- SAN storage with GPFS.
 - 144 To as sharing filesystem
 - Used by grid users (grid software area, grid home,...)
 - Used mainly by locals users
 - The corner stone of the LAPP storage hardware
- DPM grid storage (~550To + 75To out at the end of this month)
 - Many (~exclusively) for ATLAS
 - 15 disks servers (+ 5 out before end of June 2012)
 - All connected via 10Gb/s link to the stack.
 - Capacity per disk servers : 20, 40, 60 To (15 for the first 5)

Network and Services

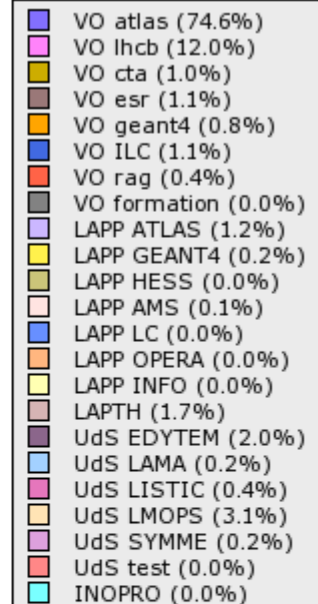
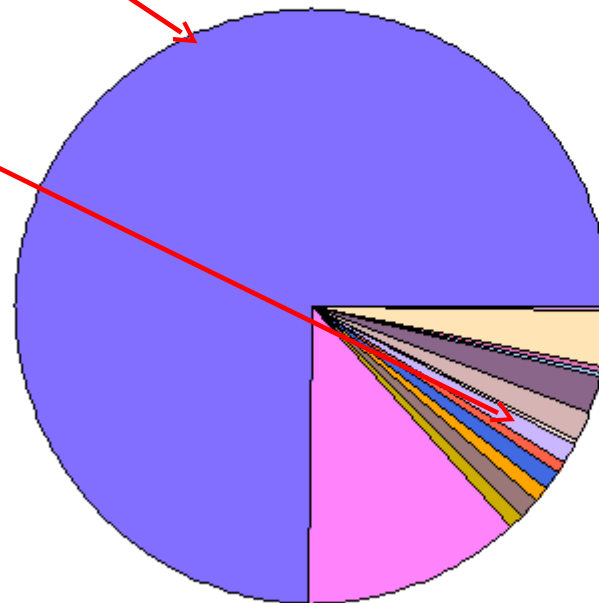
- Network infrastructure
 - A specific stack for grid
 - 2 Extrem Network x650 switch (48 ports 10Gb/s)
 - Every blade center/disk server is connected directly to this stack
 - Link to NREN: Renater is via regional network (1Gb/s shared)
- Grid Services available
 - LCG-CE (should be decommissioned soon) , Cream-CE
 - SE (DPM)
 - Squid , WMS , LB, MYPROXY, TOPBDII , SITEBDII
 - Some of them are running on virtual host (VMware)
- Everything (computing, storage and services) are installed and configured via quattor
- Use Cacti, Nagios and Ganglia for monitoring of network, hosts
- Use blade management system for hardware action (on/off/...)

cpu activity

ATLAS GRID

ATLAS LAPP

**Groupes applicatifs : Occupation relative
des ressources (walltime) par groupe
d'avril 2011 à avril 2012**

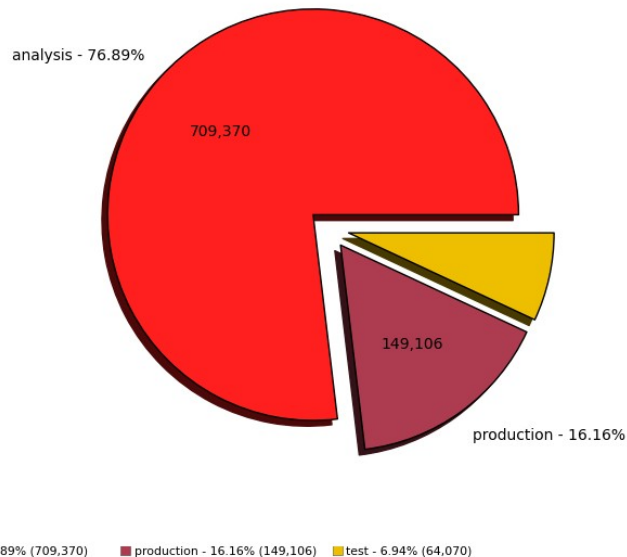


LAPP CLUSTER Last Year (walltime) from LAPP
Accounting

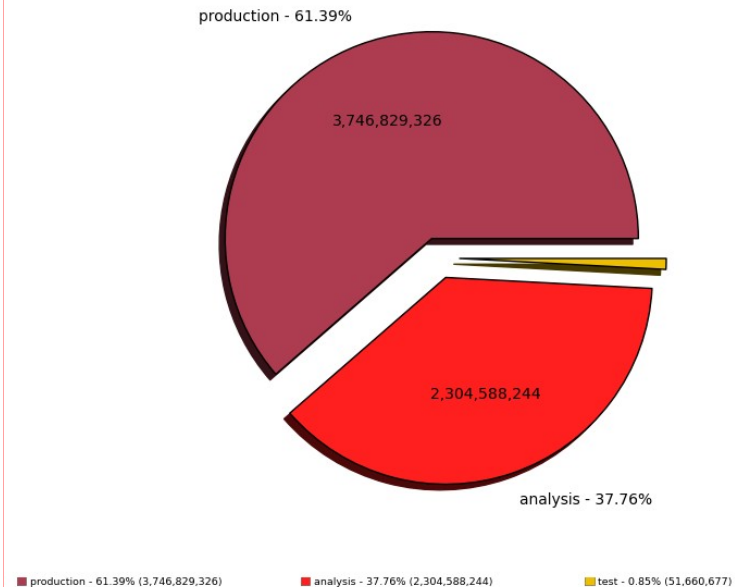
ATLAS cpu activity

- IN2P3-LAPP is an ATLAS production multicloud site
 - Jobs of production from French cloud
 - Jobs of production from Italian cloud
- All jobs slots are allowed to use until 20 Go of local disk.

Completed jobs (Sum: 922,546)



Wall Clock consumption Good Jobs in seconds (Pie Chart) (Sum: 6,103,078,247)

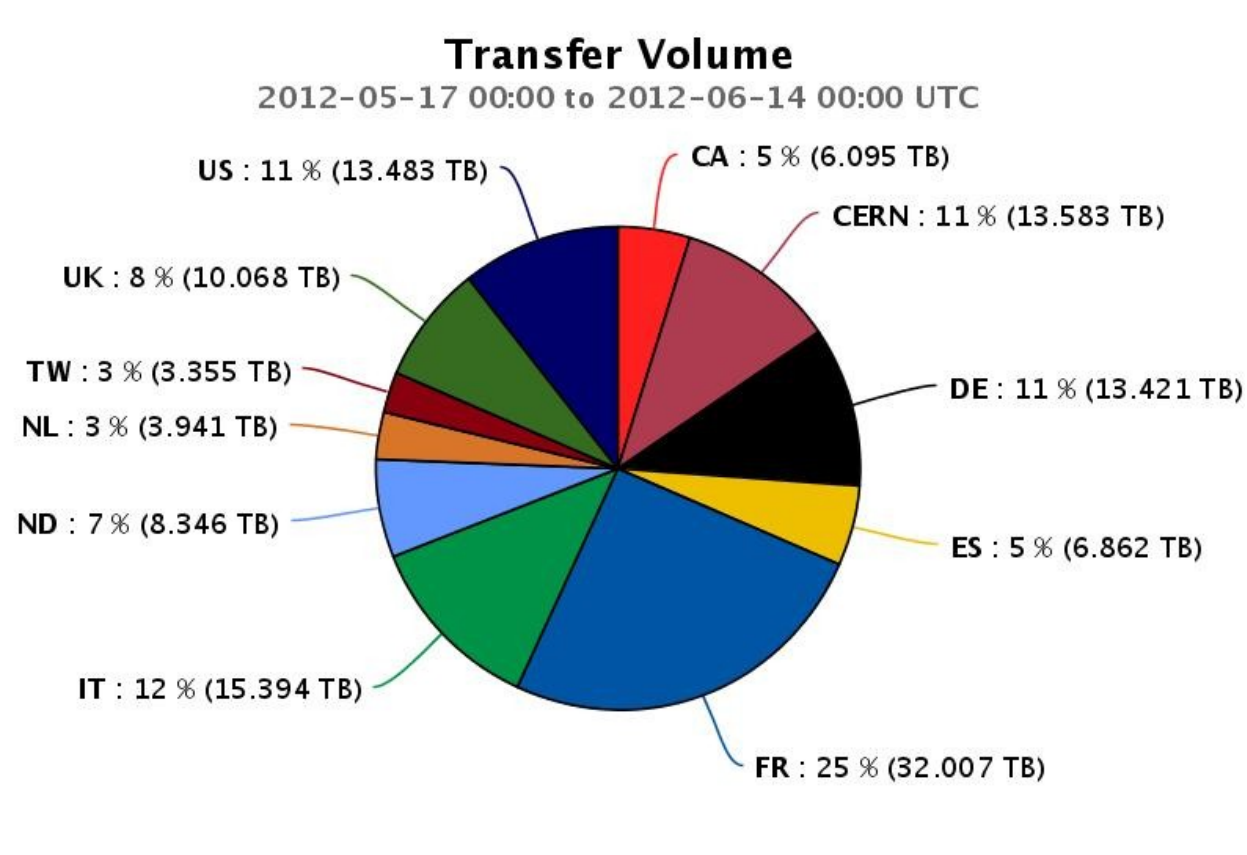


CERNVMFS

- CERNVM FS is supported on every Worker Nodes
 - ATLAS
 - LHCb
 - Geant4
- Before using CERNVMFS to provide ATLAS software LAPP used GPFS. An analysis of real ATLAS jobs (production and analyses) show a difference of efficiency between GPFS and CERNVMFS of $\pm 2\%$
 - Cernvmfs had no impact on site efficiency ☺
 - Cernvmfs has an impact on local disk consumption
 - Cernvmfs is useful for software deployment (ATLAS point of view) ☺
 - Site cannot exporting the Atlas software installed by grid to other hosts (we do it before with GPFS)

ATLAS transfer activity

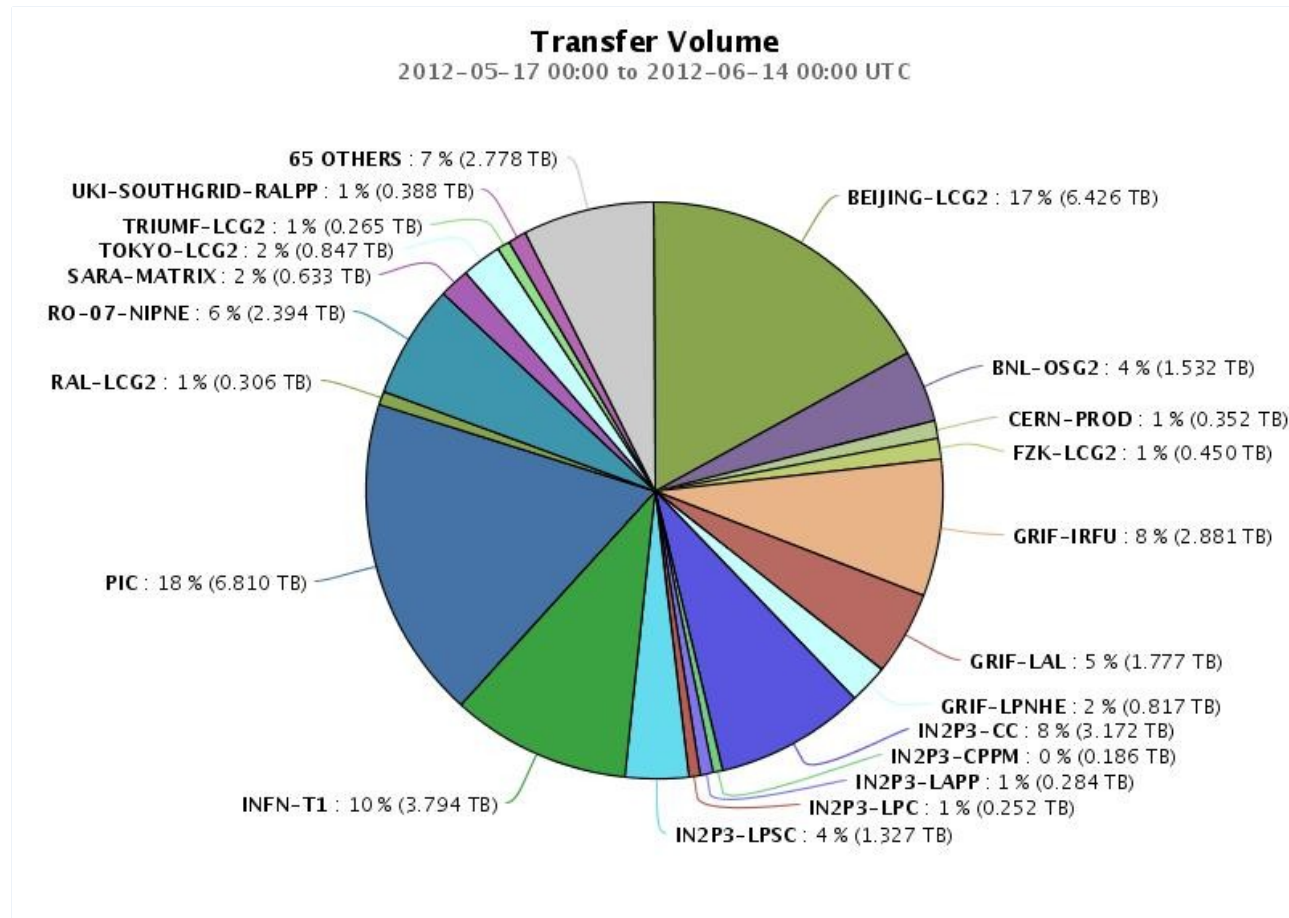
- Good distribution of incoming data over all the ATLAS Cloud



Transfer volume by cloud source to LAPP (28 days)

ATLAS transfer activity

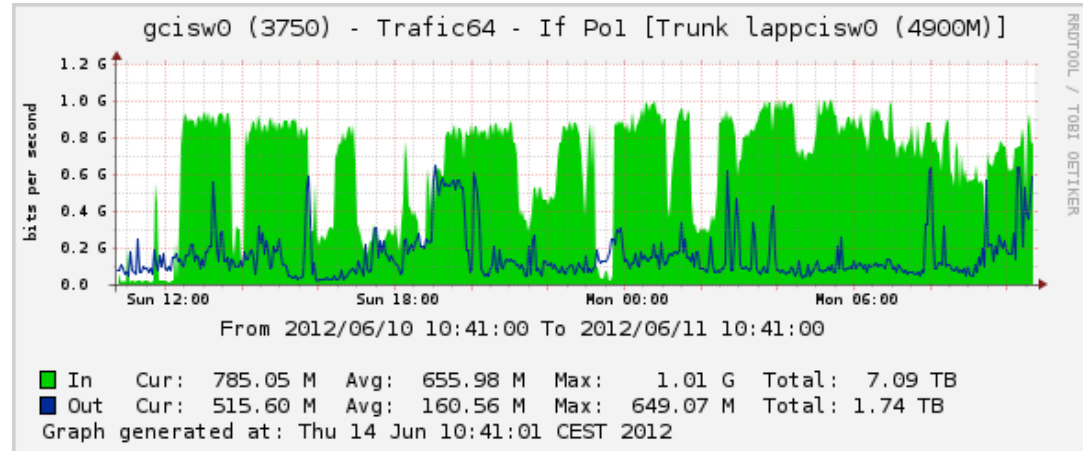
- LAPP provide data mainly to French Cloud but not only



Transfer volume from LAPP to sites (28 days)

ATLAS transfer activity

- Main limitation is the WAN connection to NREN
 - 1 Gb/s Share
 - Internal disk servers and grid stack are 10Gb/s capabilities
- Tune the FTS channel to limit the number of transfers in order do not overload the WAN link.

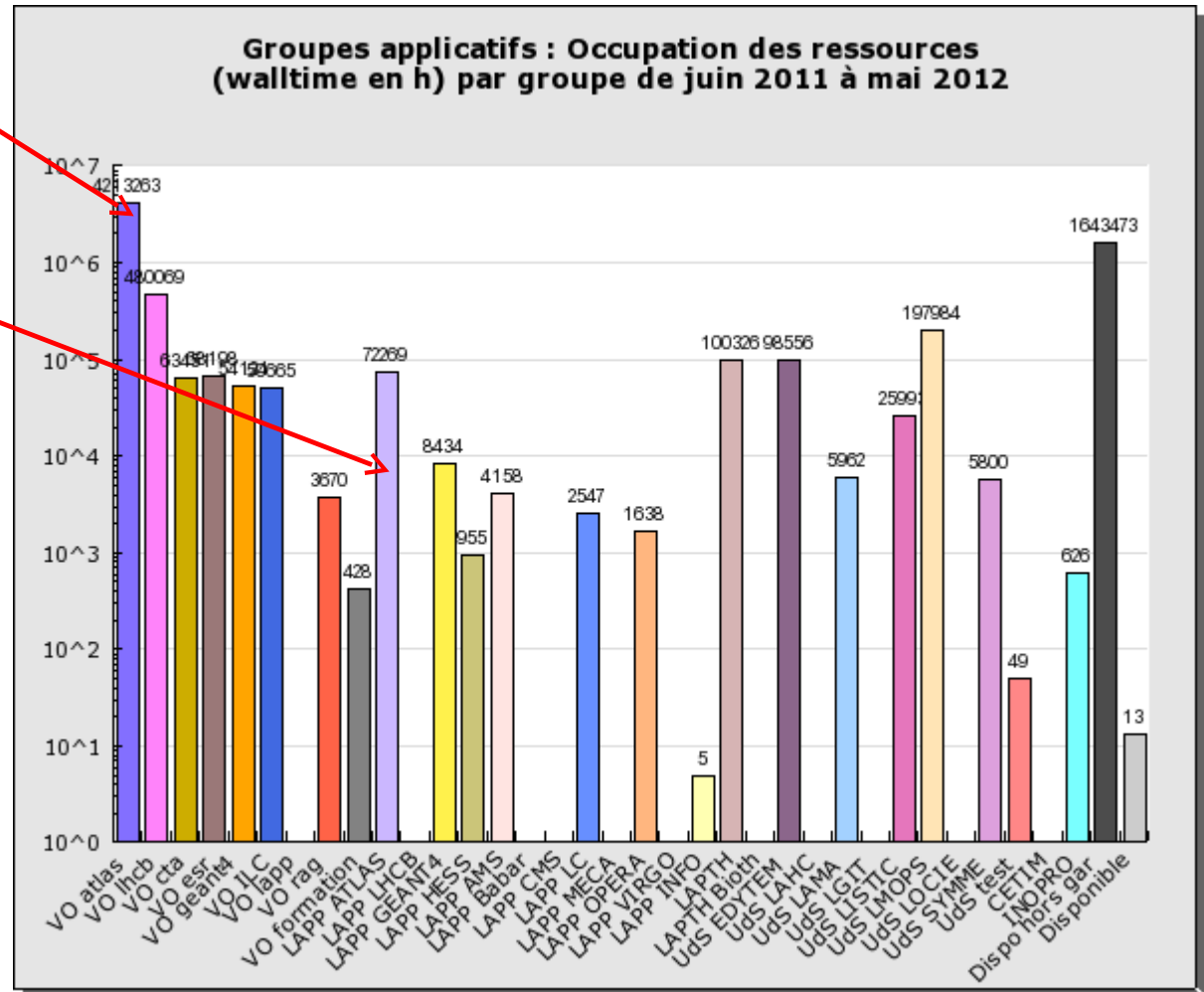


Question

cpu activity

ATLAS GRID

ATLAS LAPP



LAPP CLUSTER Last Year (walltime) from LAPP
Accounting