



Site Report

Roberto Gomezel
INFN

NERSC/LBNL at LBNL in Berkeley
26-30 October 2009

Outline

- Introduction
- Grid
- AFS
- AAI
- Virtualization
- IPv6
- Batch system
- Storage
- Networking

INFN Structure: news

- Procedure started to evaluate candidates for the position of next INFN President
 - Actual President Roberto Petronzio is in charge until June 2010
- INFN suffered from a manpower reduction from 2014 position in 2004 to actual 1906
- Computing Committee decided during last September meeting to get information from INFN units about costs to keep computing farms up and running
 - (electric power, cooling...) in order to find out how to move in the next future after the 10% budget cut for general expenses
 - to promote a different way of financing computing inside Scientific Commissions
 - evaluate a contribution for each computing unit or storage unit to maintain the computing infrastructure

AFS

- AFS cell **inf.n.it**
 - **10 FileServers distributed all over the country (in 9 INFN sites):**
 - They offer a total of 7.5 TBytes of disk space organized in 3017 volumes to 1676 cell users
- Other cells:

Cell name	Auth	FS	Volumes	Users	Online TB	Backup
ba.infn.it	K5	2	306	320	0.4	vos dump + copy
le.infn.it	K5	3	1498	796	10.0	AFS backup
Inf.infn.it	K5	7	2212	1352	16.0	Tivoli TSM
lngs.infn.it	K5	2	850	764	0.4	AFS backup
pi.infn.it	K4	6	2500	999	1.7	vos dump + copy
roma3.infn.it	K5	1	126	67	5.0	vos dump + copy
kloe.infn.it	K4	2	332	154	15.0	Tivoli TSM

European OpenAFS Workshop

- The Workshop took place in Rome last September
- It was an occasion to meet gatekeepers and to discuss a possible contributions coming from HEP European sites in order to have some new functionalities implemented
 - HEP sites interested so far
 - CERN, DESY, INFN, Max Planck

GRID

The **IGI Grid Infrastructure** is constituted by various local Grid Infrastructures setup in the framework of national and EC-funded projects (CYBERSAR, CRESCO, EGEE, INFN GRID, PI2S2, SCOPE, etc.).

The **IGI Operations Unit** will be responsible for operating the national Grid Infrastructure, and will operate in collaboration with the EGI Operations Unit.

IGI will rise to the challenge to integrate **heterogeneous computing and storage resources**, and to enable the **interoperation** between regional/institutional Grids and HPC centers.

The **IGI middleware release** will extend the EGI Unified Middleware Distribution, and will incorporate additional components according to the requirements of local user communities. In addition to the middleware services, IGI will provide fundamental services such as **accounting, monitoring, security and support**.

The Italian production GRID

VOs and Users

50 VOs:

- 4 LHC (ALICE, ATLAS, CMS, LHCb)
- 30 other Global VOs
- 6 regional VOs
- 7 external VOs (other Grid projects)
- 3 “operations” VOs (DTEAM, OPS, INFN-GRID)
- 1 catch all VO: GRIDIT

INFN-GRID Middleware Release:

- based on EGEE gLite release
- some additional components :
 - DGAS (accounting)
 - GridFTP server
 - Quattor scripts
 - enhancements for dynamic Info-providers (LSF)
 - transparent support for MPICH and MPICH-2
 - GRelC (Grid Relational Catalog)
 - StoRM (Storage Resource Manager)
 - GFAL Java API & NTP



By Luciano Gaido

NERSC/LBNL at LBNL in Berkeley
26-30 October 2009

Authorization-Authentication Infrastructure

- Project to provide and to deploy a common authentication and authorization infrastructure to INFN sites based on Kerberos5 and LDAP
- Pilot test INFN-AAI for Lecce, LNF and Milan next January 2010
- Inclusion of all INFN sites by the end of 2010
- This infrastructure is providing a tool to get access to central application and to implement a Single Sign-on support

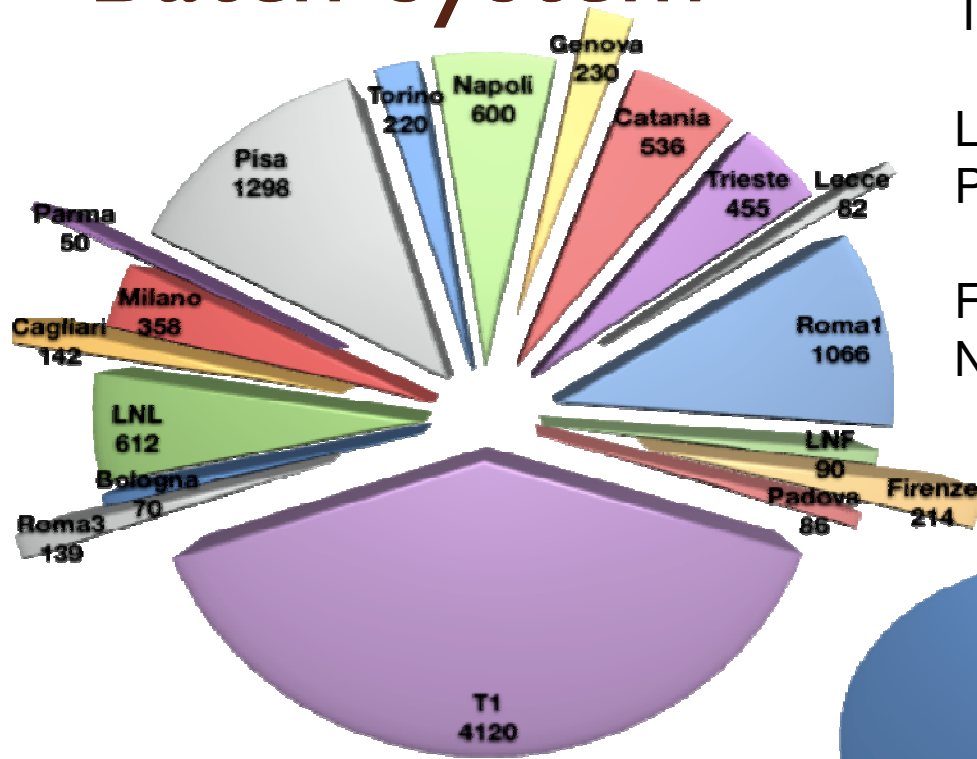
Virtualization

- High Availability
 - Fault tolerance, backup, load balancing
- KVM proved good stability and reliability
 - CPU and Network performances are good
 - Disk I/O seems the most problematic issue
- On-demand Virtualization and Grid/Cloud Integration
 - Decouple installed software from physical hardware
 - VMs can run different images for different (sets of) users
 - Andrea Chierici's talk gave you more details about that

IPv6 activities

- The WG keeps on working in testing and evaluating IPv6 addressing
- We got from GARR (Network Provider) an addressing plan for INFN
 - An IPv6 address /40 subnetted /48 to assign to different INFN sites:
 - **2001:760:4200::/40**
- A proposal: moving our private networks using NAT to Ipv6 addresses using dual stack in order to get access to Internet
 - It could be a good way to get used to Ipv6 configuration and management in our sites

Batch System



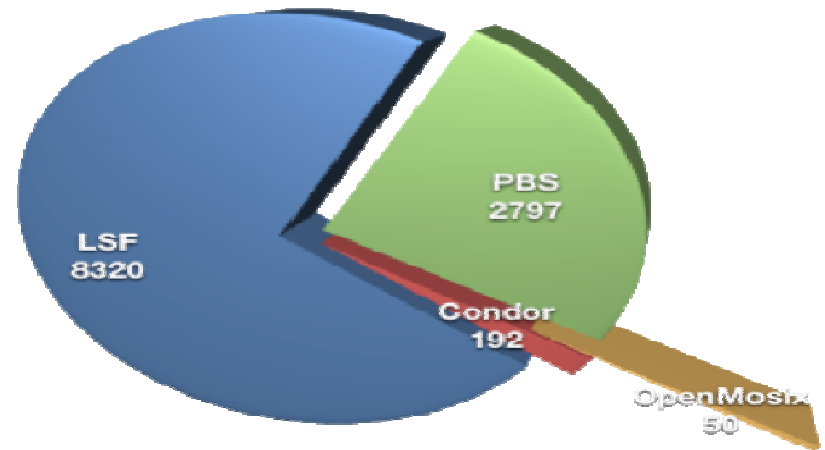
Total slot: 11390 (August 2009)

LSF: 73%

PBS:24%

FairShare usage: 85%

No Preemption: 94%



Thanks to Alessandro Italiano (CNAF)

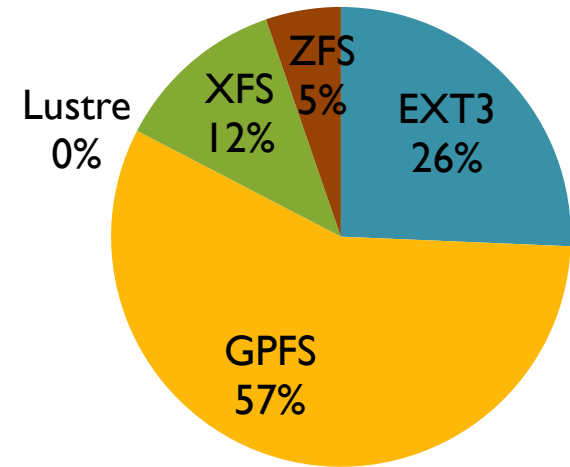
Operating systems

- Scientific Linux 5 on desktop and laptop in order to support new hardware devices
- Scientific Linux 4 in computing farms
 - Some experiments still claim to use it
- Still a mix of Windows XP and Vista
 - great interest in moving soon to Windows 7
 - people reported a good feeling after testing and using it
- MacOSX is appealing for many users but the support we do provide is still “best effort”

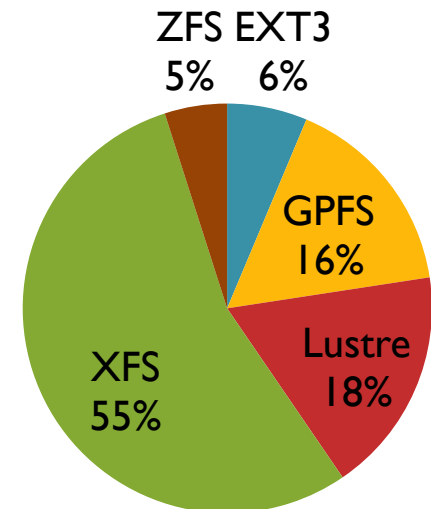
Storage

- GPFS is the distributed file system used in a lot of INFN sites as common storage infrastructure for farm computing
 - Got an agreement in order to keep prices reasonable
- One T2 site using Lustre

File system- other sites



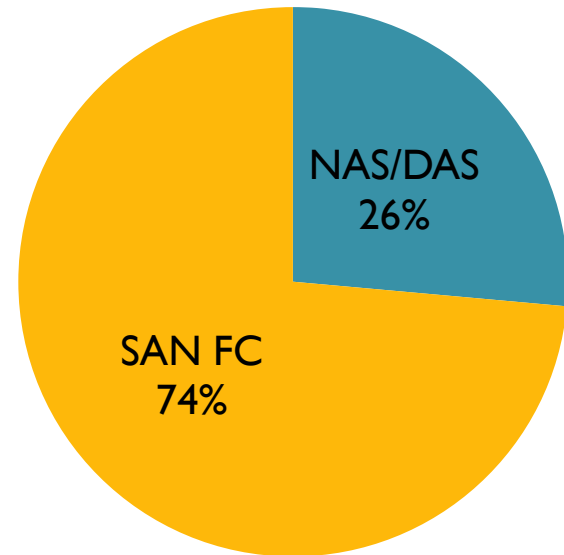
File system-T2



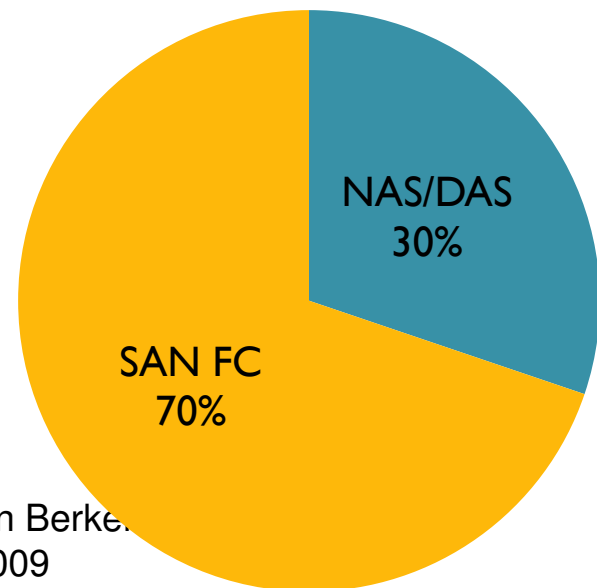
Storage

- SAN architecture is commonly adopted as storage infrastructure
- 10Gb ports switch as concentrator of rack switch and file server equipped with 10Gb Ethernet interface is likely to be a favorable model in computing farms

Storage architecture - other sites



Storage architecture - T2



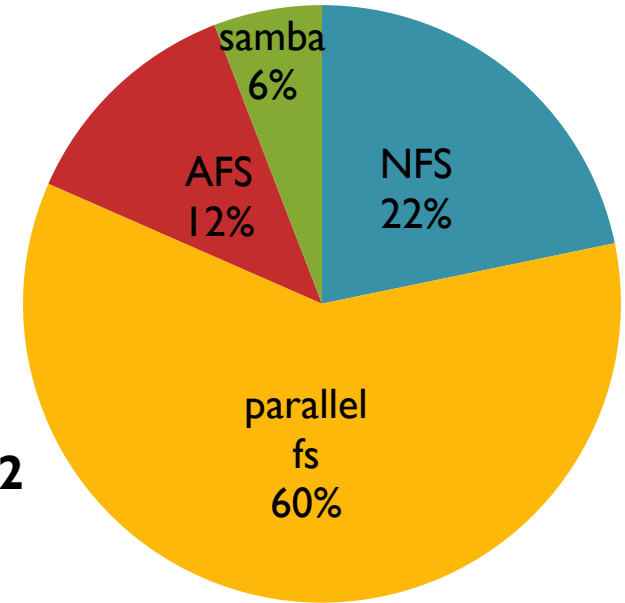
By Alessandro Brunengo

NERSC/LBNL at LBNL in Berkeley
26-30 October 2009

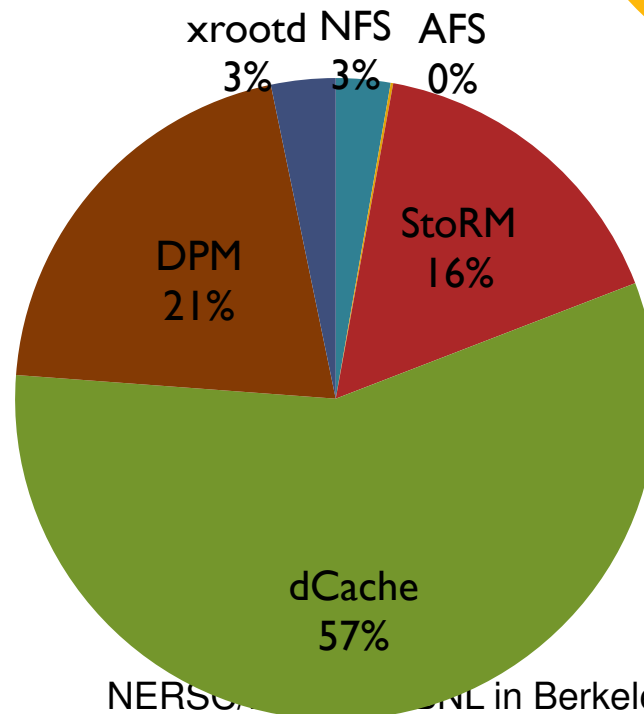
Storage

- Remote access:
 - dCache is the most used in T2

Remote access - other sites



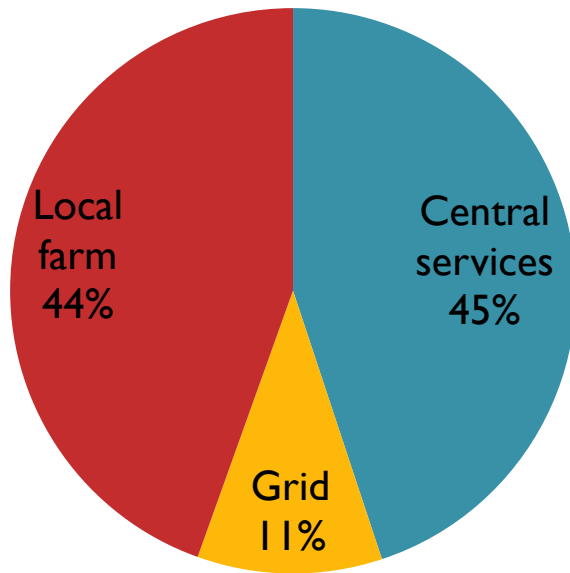
Remote access - T2



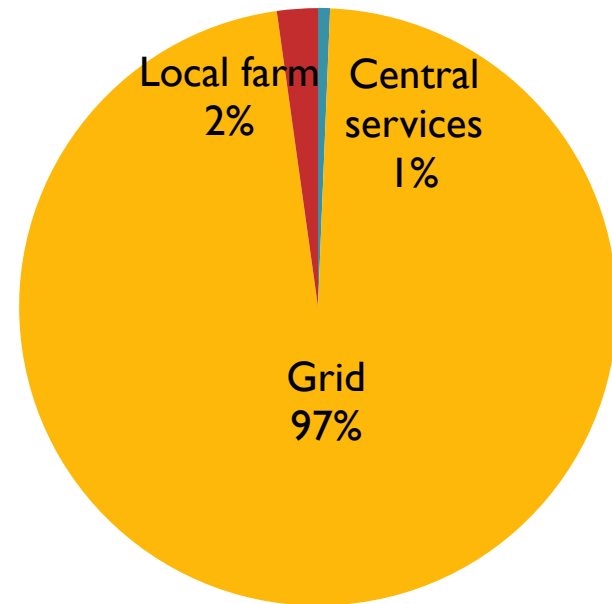
By Alessandro Brunengo

Storage usage

Storage usage - other sites



Storage usage - T2



Network

- Garr-X upgrade planned for 2009 slowed down due to budget cuts
 - Final deployment of new infrastructure by the end of September 2010
- any Tier2 will be interconnected to Tier I via a dedicated 10 Gigabit link
 - Evaluation underway for the best device being installed to get access to the network