Site Report

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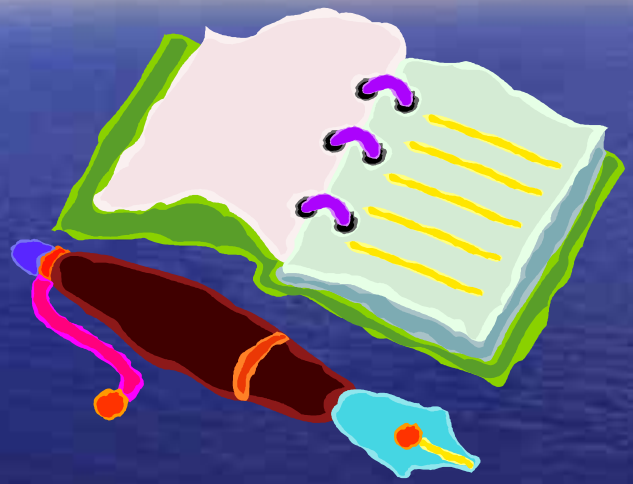
Outline of Presentation

- New Computing Committee
- Computing Environment
- Security
- Services
- Network
- AFS
- INFN Farms
- Tier1@CNAF



New Computing and Networking Committee

- Last June the previous Computing and Networking committee expired so a new one was formed
- Mauro Morandin (INFN-Padova) is the new chairman of the committee and some members have been replaced
- This committee has been charged with the following explicit mission:
  - To coordinate implementation of computing farm with particular regard to LHC Tier-1, Tier-2 and Tier-3
  - To participate to national and international coordination committees focused on topics related to CNC interests
  - To promote innovation and technological coordination of computing and networking of INFN sites
  - To coordinate and to finance technological development and maintenance of computing resources

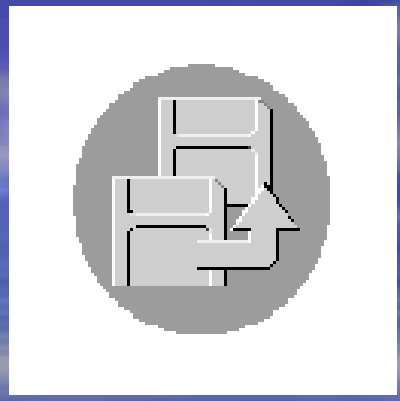
Computing Environment and security

- Most of boxes are PCs running Linux or Windows
- Mac OS boxes keep on living
- VPNs available in many sites
  - Cisco and Netscreen boxes using IPsec
  - SSL VPNs are currently used by some sites
    - Interested results at LNF using Cisco VPN Concentrator
- Network Security
  - Dedicated Firewall machines just in a few sites
  - Implemented with access lists on router connected to WAN

Desktop

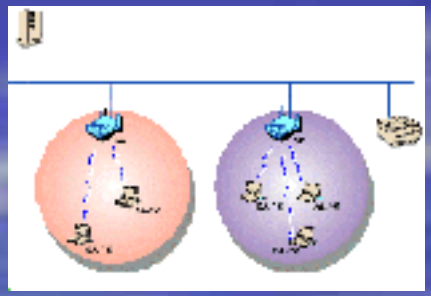
- PCs running Linux, Windows and Mac OS
- SL and SLC are equally used
- A few sites use Caspur BigBox release
- Some units are taking advantage of outsource support for windows desktop environment because of lack of personnel

Backup



- Tape Libraries used:
  - IBM Magstar – just used at LNF
  - DLT, LTO2 – wide spread
  - LTO3 will naturally replace LTO2 drives in the next future
- Backup tools:
  - IBM Tivoli – quite used
  - HP Omniback – quite used
  - Atempo Time Navigator – just a few sites
  - Domestic tools - widespread

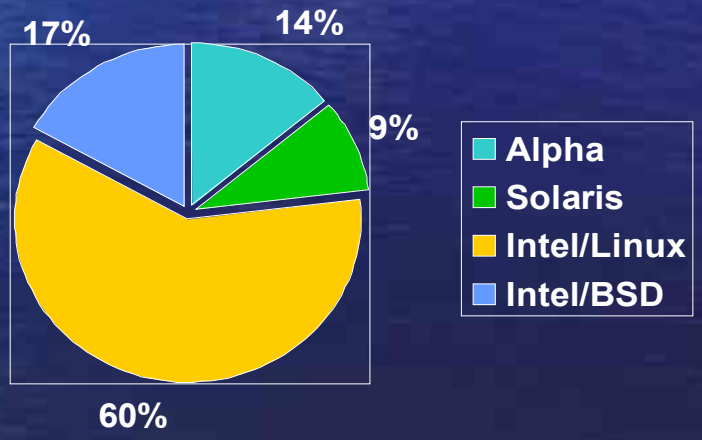
Wireless LAN



- Access point running standard 802.11a,b,g
- All sites are using wireless connection during meeting or conferences
- Most of them use it to give connection to laptop computers
- A specific working group keeps on investigating in order to provide a common solution to solve security issues
  - To go beyond the permission based on Secure Port filtering (MAC Address) – (very poor)
    - 802.1X is a good solution but it is not implemented and working well on all platforms in use
  - To investigate the standard 802.16 (WiMAX)

E-mail

- Mail Transfer Agent
  - Sendmail – widespread and more used (70%)
  - Postfix – a few sites (30%) (increased if compared with last report to confirm the trend reported last year)
- Hardware and OS



E-mail user agent

- All INFN sites provide an HTTP mail user agent
  - IMP
  - SQUIRREL (increased use is due to its light impact and good response time)
  - Others:
    - IMHO, Open WebMail, Cyrus+Roxen…
- Other mail user agents commonly used:
  - Pine, Internet Explorer, Mozilla, Thunderbird…

E-mail antispam

- The last Computing and Networking Committee decided to subscribe a nation wide license for using Sophos as common tool to reduce junk e-mail and to provide antivirus control
- Some sites used RAV or SPAM Assassin
- By the end of this year every site is supposed to move to Sophos not only for the pure message functionality but also as antivirus tool for PCs
- Only authorized mail relays are allowed to send and receive mail for a specific site
- An increasing number of sites are **filtering** outbound connections on **port 25** to prevent users from sending viruses unconsciously

INFN network

- LAN backbone network mainly based on Gigabit Ethernet
  - 10 Gbit Ethernet switches used in computing farm
- The *INFN* WAN network is completely integrated into the GARR, providing a backbone connectivity at 54 Gbps
  - POP typical access bandwidth for INFN sites: 34Mbps, 155 Mbps, 622 Mbps and Gigabit Ethernet
  - CNAF Tier-1 will be connected at 10Gbps soon
  - There are still just a few small research groups connected via multiple 2Mbps links because of lack of efficient telecommunication infrastructure
  - Access to GEANT2: N * 10Gbps links soon

AFS

- INFN sites keep on using AFS services to share data and software throughout sites
- Local cells have completely moved or are moving to Linux boxes running OpenAFS software
- The migration of INFN.IT authentication servers from Kerberos IV to Kerberos V was accomplished last June
  - A Kerberos V master server has been installed on a Linux machine: k5.infn.it
  - The former 3 AFS authentication servers (CNAF ,Naples and Rome) have been reconfigured as Kerberos V slave servers
- K5 WG is now working in order to test the usage of trust relationship authentication between different INFN cells

INFN Site Farm: update

- A lot of sites are configuring and integrating computing facilities and local experiment-specific farm into a unique computing farm
- Widespread deployment of SAN infrastructure to connect storage systems and computing units
  - GPFS file system is becoming the most adopted as an efficient way of providing a cluster file system and volume manager
  - The increasing usage allows people to have support from other sites when problems arise
  - Even though Tier-1 is evaluating to move to Lustre because of lack of support from IBM on GPFS within a heterogeneous environment
- There is an increasing use of LSF as tool for submitting jobs to computing farm using different queues
  - Server license hosted at CNAF – Tier1
  - Incoming sites can take advantage of the increasing experience coming from Tier1 and other units like Padua, Pisa and Catania

Storage WG

- The last CNC promoted the creation of a storage working group
- This group has been working since march 2005
- Main tasks
  - To evaluate the opportunity of using Fibre Channel technology as common infrastructure for Computing Facility at each site
  - To investigate on the most common distributed file systems available evaluating performance and reliability
    - With particular regard to the startup of next Tier-2 farms
  - To keep in touch with the HEPiX Storage task force activity
  - To take into account the impact of GRID requirements on storage file system
- First status report at CNC meeting next week

TIER-1@CNAF Status Report: Introduction

- Location: INFN-CNAF, Bologna (Italy)
  - one of the main nodes of GARR network
- Computing facility for INFN HNEP community
  - Partecipating to LCG, EGEE, INFNGRID projects
- Multi-Experiment TIER1
  - LHC experiments
  - VIRGO
  - CDF
  - BABAR
  - AMS, MAGIC, ARGO, PAMELA,…
- Resources assigned to experiments on a yearly basis.

Infrastructure

- Hall in the basement (-2nd floor): ~ 1000 m² of total space
  - Easily accessible with lorries from the road
  - Not suitable for office use (remote control)
- Electric power
  - 220 V mono-phase (computers)
    - 4 x 16A PDU needed for 3.0 GHz Xeon racks
  - 380 V three-phase for other devices (tape libraries, air conditioning etc…)
  - UPS: 800 KVA (~ 640 KW)
    - needs a separate room (conditioned and ventilated).
  - Electric Generator: 1250 KVA (~ 1000 KW)
    - → up to 160 racks (~100 with 3.0 GHz Xeon)
    - → Expansion under evaluation

HW Resources (1/2)

- CPU:
  - 700 biprocessor boxes 2.4 – 3 GHz (+70 servers)
  - 150 new Opteron biprocessor boxes 2.6 GHz
    - 1300 KSi2k Total
    - Decommissioning ~ 100 WNs (~ 150 KSi2K) moved to test farm
  - Each CPU equipped with FE switch with 2xGb uplinks to core switch
- Disk:
  - FC, IDE, SCSI, NAS technologies
  - 470 TB raw (~ 430 FC-SATA)
  - Disk servers connected via GE to core switch

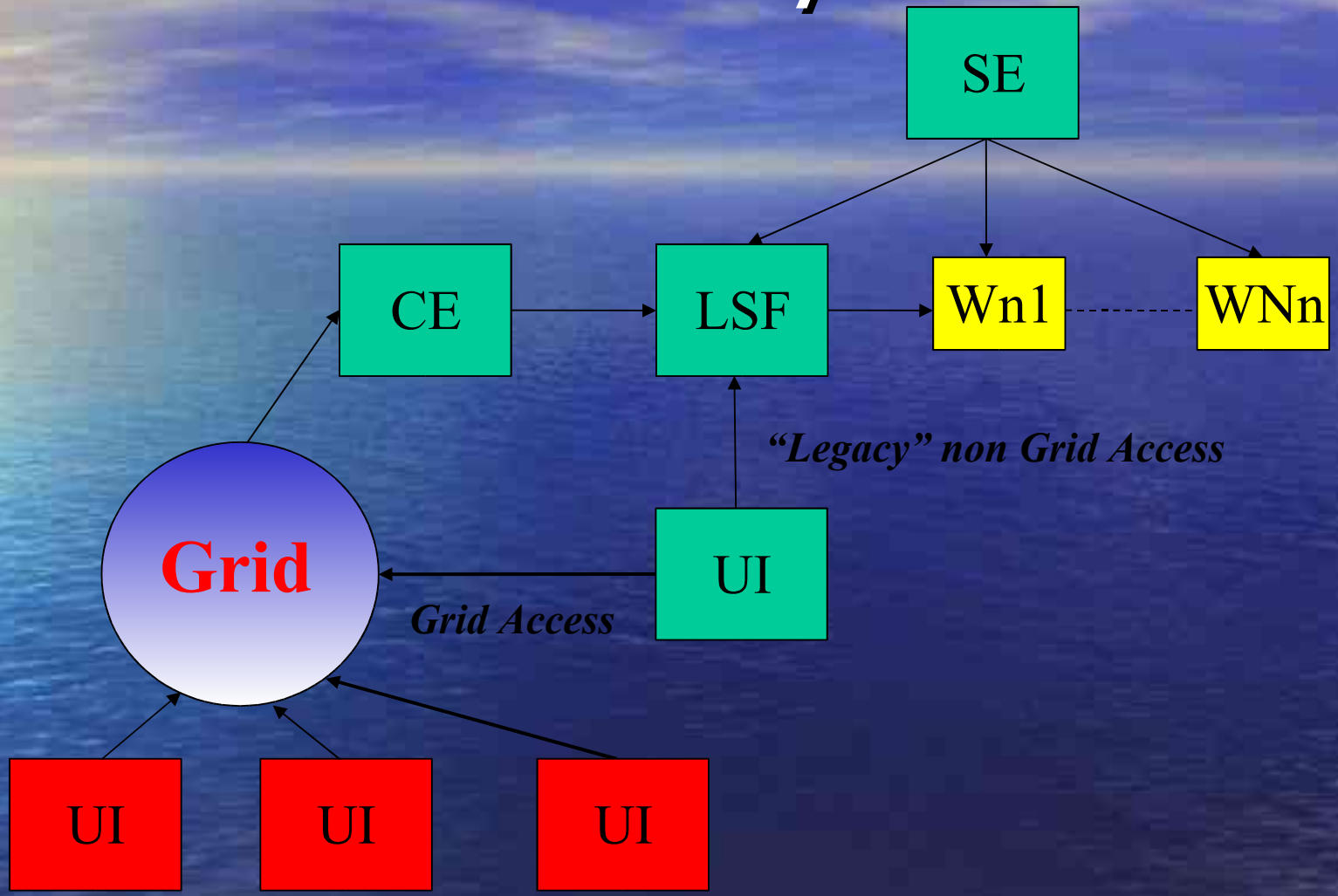
HW Resources (2/2)

- Tapes:
  - **Stk L180 18 TB**
  - **Stk 5500**
    - **6 LTO-2 with 2000 tapes → 400 TB**
    - **2 9940B with 800 tapes → 200 TB**
- Networking
  - **30 rack switches → 46 FE UTP + 2 GE FO**
  - **2 core switches → 96 GE FO + 120 GE FO + 4x10 GE**
  - **Foreseen backbone upgrade to 10 Gbps**
  - **3x1Gbps links to WAN (on going upgrade to 10 Gbps)**
    - **1 Gbps production link**
    - **10 Gbps Service Challenge (LHCOPN) link**

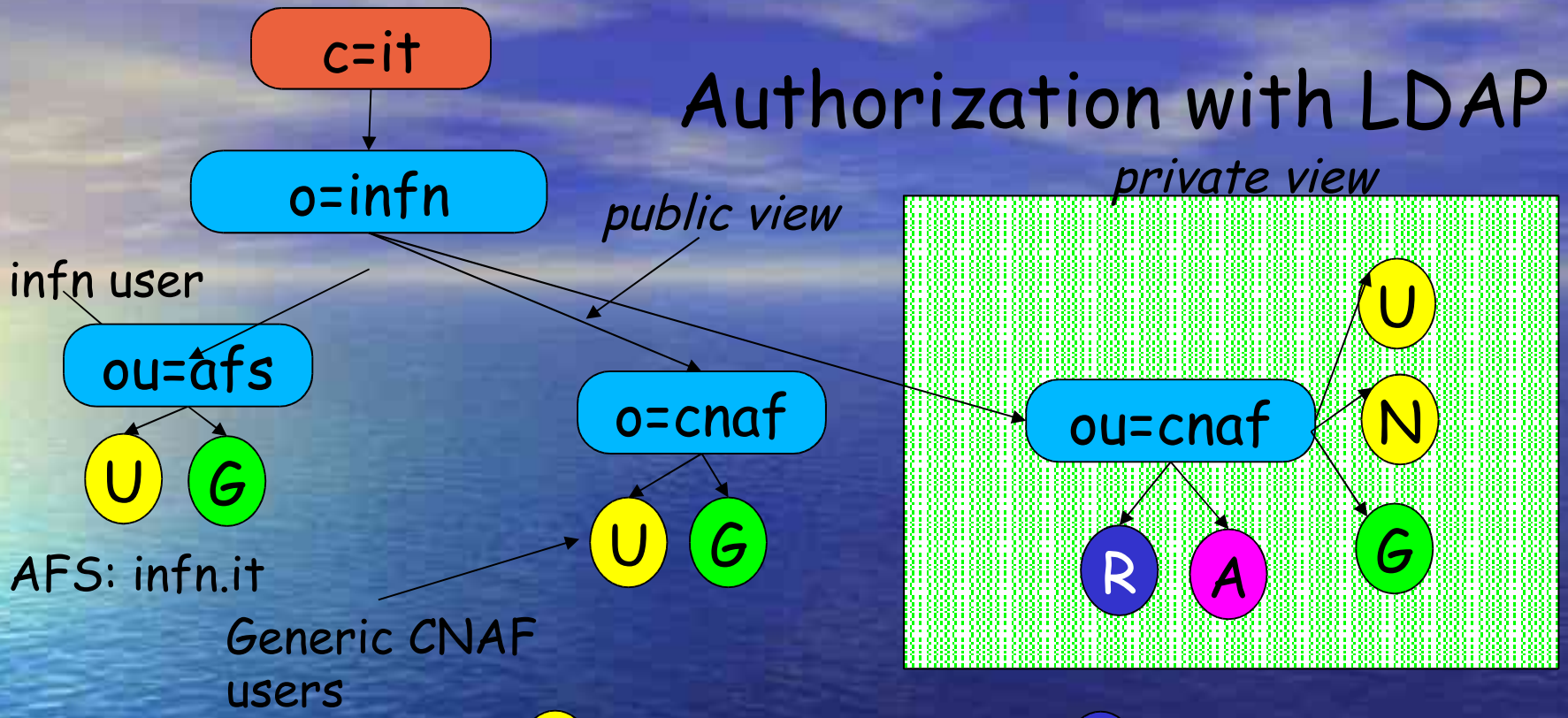
Farm status

- SLC 3.0.5/LCG 2.6 installed on farm
  - Installation via quattor (project-lcg-gdb-quattor-wg@cern.ch)
    - Deployed upgrade to 500 nodes in one day
  - Standard configuration of WNs for all experiments
- Migration from torque+maui to LSF (v6.1) last Spring
  - LSF farm running successfully
  - Fair sharing model for resource access
    - 1 queue/experiment (at least)
  - Special MPI queue on dedicated resources (InfiniBand)
  - Progressive inclusion of CDF farm into general one
- Access to resources centrally managed with Kerberos (authc) and LDAP (authz)
  - Group based authorization

Access to Batch system



Authorization with LDAP



U ou=people

R ou=role

G ou=group

A ou=automount

N ou=people-nologin

Storage status

- Physical access to main storage (Fast-T900) via SAN
  - Level1 disk servers connected via FC
    - Usually also in GPFS cluster
      - Easiness of administration
      - Load balancing and redundancy
      - Lustre under evaluation
  - Can be level2 disk servers connected to storage only via GPFS
    - LCG and FC dependencies on OS decoupled
- WNs are not members of GPFS cluster (no scalability on large number of WNs)
  - Storage available to WNs via rfio, xrootd (BABAR only), gridftp/SRM or NFS (sw distribution only)
- CASTOR HSM system (SRM interface)
  - STK library with 6 LTO2 and 2 9940B drives (+4 to install)
    - 1200 LTO2 (200 GB) tapes
    - 680 9940B (200 GB) tapes