# "A prototype for INFN TIER-1 Regional Centre"

Luca dell'Agnello INFN – CNAF, Bologna Workshop CCR La Biodola, 8 Maggio 2002

#### **INFN – TIER1 Project**

- Computing facility for INFN HNEP community
  - Usage by other countries will be regulated by a Mutual Agreements
- Multi-Experiment TIER1
  - LHC experiments (ALICE, ATLAS, CMS, LHCb)
  - VIRGO
  - CDF (in a near future)
- Resources assigned to Experiments on a Yearly Plan.
- Location: INFN-CNAF, Bologna (Italy)
  - one of the main nodes of GARR
- TIER2, TIER3 under development at other places
- INFN-TIER1 is a prototype!
  - 4th quarter 2003: End of project
  - Winter 2004: experimental phase revision and new master plan
  - 2004: TIER1 becomes fully operational





#### Issues

- Technical staff
  - Recruiting & Training
- Resource management
  - Minimization of manual operations
- Sharing of resources (network, CPU, storage, HR) among experiments
  - Resource use optimization
- Compatibility between tests and production activity
  - Technological tests for Tier-1
  - Prototype phase (LHC experiments)
  - Production phase (VIRGO)
- Integration with (Data)grid framework
  - interoperation
  - Common tool development and test





#### PERSONNEL

Tvpe	Ν.	New	Outsource
Manager	1		
Deputy	1		
LHC Experiments Software	2		
Programs, Tools, Procedures	2	2	
FARM Management & Planning	2	2	
ODB & Data Management	2	1	
Network (LAN+WAN)	2	2	
Other Services (Web, Security, etc.)	2	1	
Administration	2	1	
System Managers & Operators	6		6
Total	22	9	6



- New GARR-B Backbone with 2.5 Gbps F/O lines already in place.
- CNAF-TIER1 access is now 100 Mbps and will be 622 Mbps in a few weeks

Gigapop is colocated with INFN-TIER1

- Many TIER2 are now 34 Mbps and will migrate soon to 155 Mbps.
- International Connectivity via Geant: 2.5 Gbps access in Milano and 2x2.5 Gbps links of Geant with US (Abilene+commodity) already in place.



#### Interconnection to Internet (near future)



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- Level 2 isolation of farms
  - Aid for enforcement of security measures



## **Tier1 LAN model layout**



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# Vlan Tagging (1)

- Possible solution for complete granularity
  - To each switch port is associated one VLAN identifier
  - Each rack switch uplink propagates VLAN informations
  - VLAN identifiers are propagated across switches
  - Each farm has its own VLAN
- Independent from switch brand (Standard 802.1q)
- First interoperability tests show viability of solution





## **Computing units**

Basic unit

- Intel CPU with Redhat Linux (Datagrid framework)
  - Different requirements from various experiments
    - RedHat 6.2 (moving to RedHat 7.2) + experiment specific libraries
- 1U rack-mountable dual processor servers
  - 800 MHz 1.4 GHz
  - 2 FE interfaces
  - 512 MB 2 GB RAM
- Rack unit (what we buy)
  - 40 1U dual processor servers
  - I Fast Ethernet switch with Gigabit uplink to main switch (to be upgraded in a next future)
  - Remote control via KVM switch (tests with Raritan ongoing)
- A new bid (1 rack) is in progress
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# **Computing units issues (1)**

- Coexistence Datagrid/Datatag test-beds "traditional" installations
  - Need to develop tools to manage non-grid servers
- Dynamic (re)allocation of server pools as experiments farms
  - Automatic procedure for installation & upgrade
    - LCFG (developed by Datagrid WP4)
      - Central server for configuration profiles
      - Use of standard services (NFS, HTTP)
      - Only RedHat 6.2 currently supported
      - First boot from floppy
    - LCFG+PXE protocol (only a quick patch!)
      - No floppy needed





Legato Networker for user Backup (on L180)



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test)

## **Security issues (2)**

#### LAN access control

- Packet filters on border router
  - Use of more sophisticated firewalls to be considered
- Limit traffic to known active services
- Centralized log for automatic filtering
- NIDS under consideration
  - Requires manpower!
- Servers configuration
  - Completely under our control
  - Use on-board firewall
    - Filter all unnecessary ports
  - Upgrade of vulnerable packages
    - RedHat Network Alerts, CERT alerts etc..

#### **Hw allocation**

Experiment	<u>server numbers</u>
ALICE	8
ATLAS	4
CMS	13
LHCb	5
VIRGO	7
GRID	10

