IT-INFN-CNAF
Status Update

LHC-OPN Meeting
INFN CNAF, 10-11 December 2009

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INFN CNAF

- CNAF is the main computing facility of the INFN
  - Core business: **TIER1 for all the LHC** Experiments (Atlas, CMS, Alice and LHCB)
  - Other Activities: Provide Computing Resources for several other experiments in which INFN is involved (CDF, Babar, Virgo, SuperB, ..)
  - R&D on GRID middleware development

The Computing facility

Infrastructure

Computing center infrastructure expansion has been completed in spring 2009

- More than 130 Racks are in place and the cooling system is capable of dissipating the heat produced by 2MW of installed computing devices.

- The total Electrical Distribution available for the Center is about 5MW

- The total "Protected Electrical Power" is about 3.4 MW (2 Rotary UPS + 2 Diesel Engines)

Computing Resources "at a glance"

- COMPUTING NODES
  - More than 2800 cores (6.6 MSpecINT2K or 23000 HEP Spec)
    - 1U "Standard" Servers (1 Mother Board 2 Quad Core - 8 Cores in 1U)
    - 1U Twin Servers (2 Mother Boards with 2 Quad Core -16 Cores in 1 U)
    - Blade Chassis (With 16 Servers in 10 U – 12.8 Cores in 1 U
      with integrated I/O Modules and management system)
- SORAGE
  - 2,5 PB of Disk Capacity
    - SAN (EMC2+SUN) Served by 200 Disk Servers (STORM+GPFS)
  - 5 PB of TAPE Capacity (Expandable Up to 10PB) served by 20 Drives
- NETWORK
  - 3 Core Switch/Routers
  - 60 Gigabit aggregation Switches
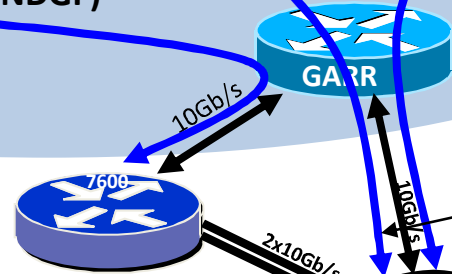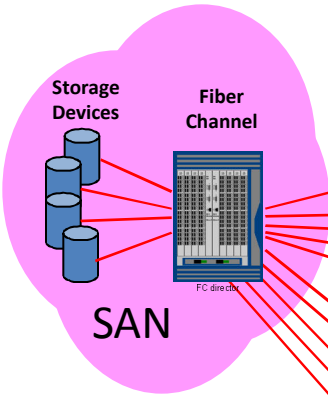 - 20 Gb/s WAN Connectivity

INFN CNAF TIER1 Network

S.Z. 12-2009
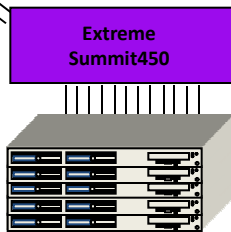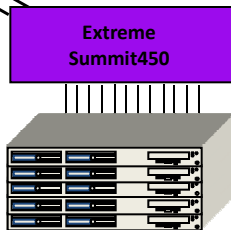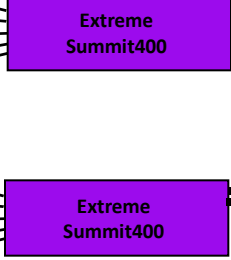
Monitoring

- Monitoring
  - MDM Devices are on line and connected to the core switch since summer '09. (Recently fixed the GPS issue with an antenna signal splitter)
  - Internal monitoring done with:
    - MRTG (Each port of the net)
    - Nagios managing alerts with automatic SMS on critical events
    - Netflow/Sflow For traffic accounting

WAN

GARR

10Gb/s

7600

2x10Gb/s

10Gb/s

Exterme BD10808

Extreme Summit400

4x10Gb/s

Exterme BD8810

MDM Servers
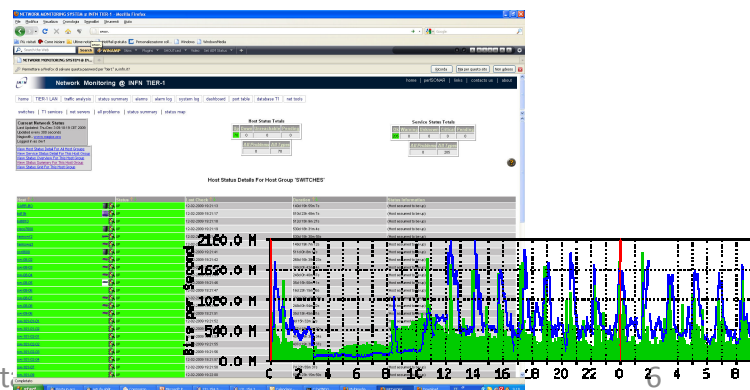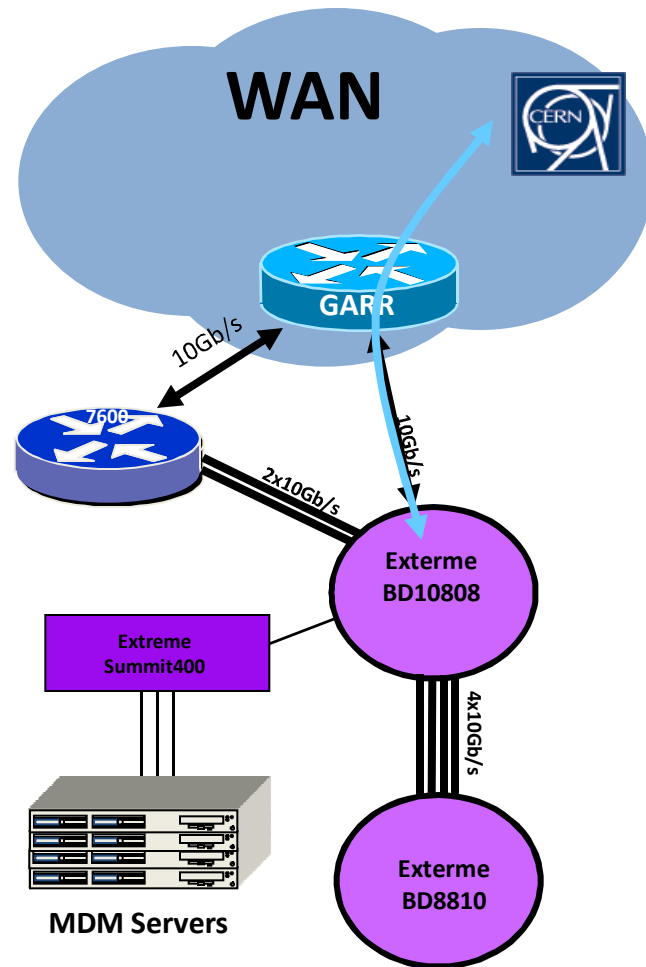
T1 WAN Connectivity evolution (Wishes)

T1 Connectivity

- **Wishes** to have a dedicated link for all the T1-T1 connectivity via a T1 or NAP well connected to US T1s. For resiliency reasons it would be better to avoid using CERN for this task.

…But solutions to have a second link through CERN seems to be more feasible in brief time and GARR is facing the possibility to start testing a 100 Gb/s Between CNAF and CERN via GEANT before the end of 2010.

All other T1s

(T1 or NAP)

CNAF-IT-T1
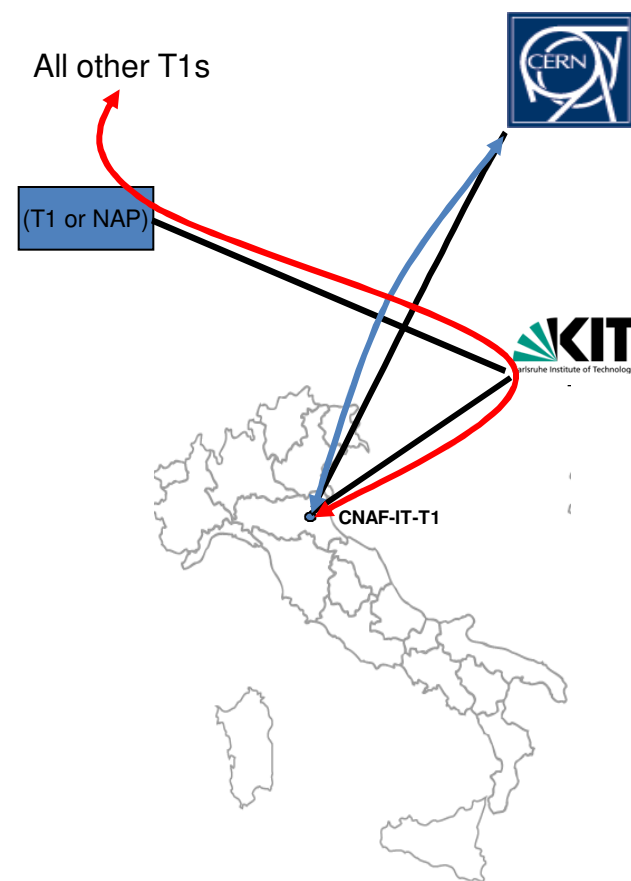
# T2 WAN Connectivity evolution

Italian TIER-2's
Bari, Catania, Milan, Naples,
Legnaro (PD), Pisa, Rome and
Turin.
Currently connected via GARR with
1Gb/s connections

Italian T2's WAN interconnections are evolving from
1 Gb/s to10 Gb/s GARR-X accesses (Q4 2010)

Each T2 needs an IP connection in order to reach
all other T1s and T2s via GEANT and INFN is
asking GARR a dedicated light paths for the traffic
between INFN CNAF and all the Italian T2s.
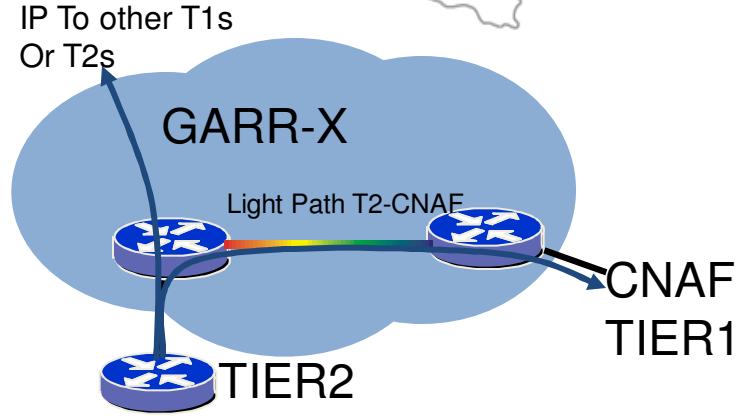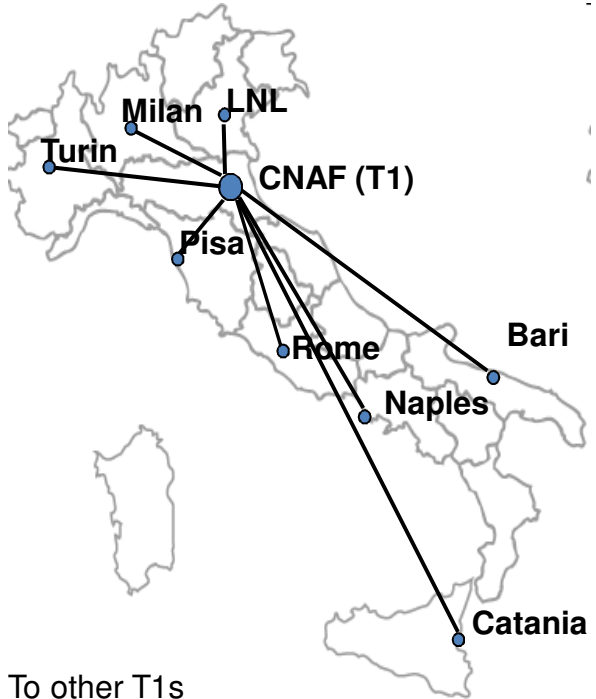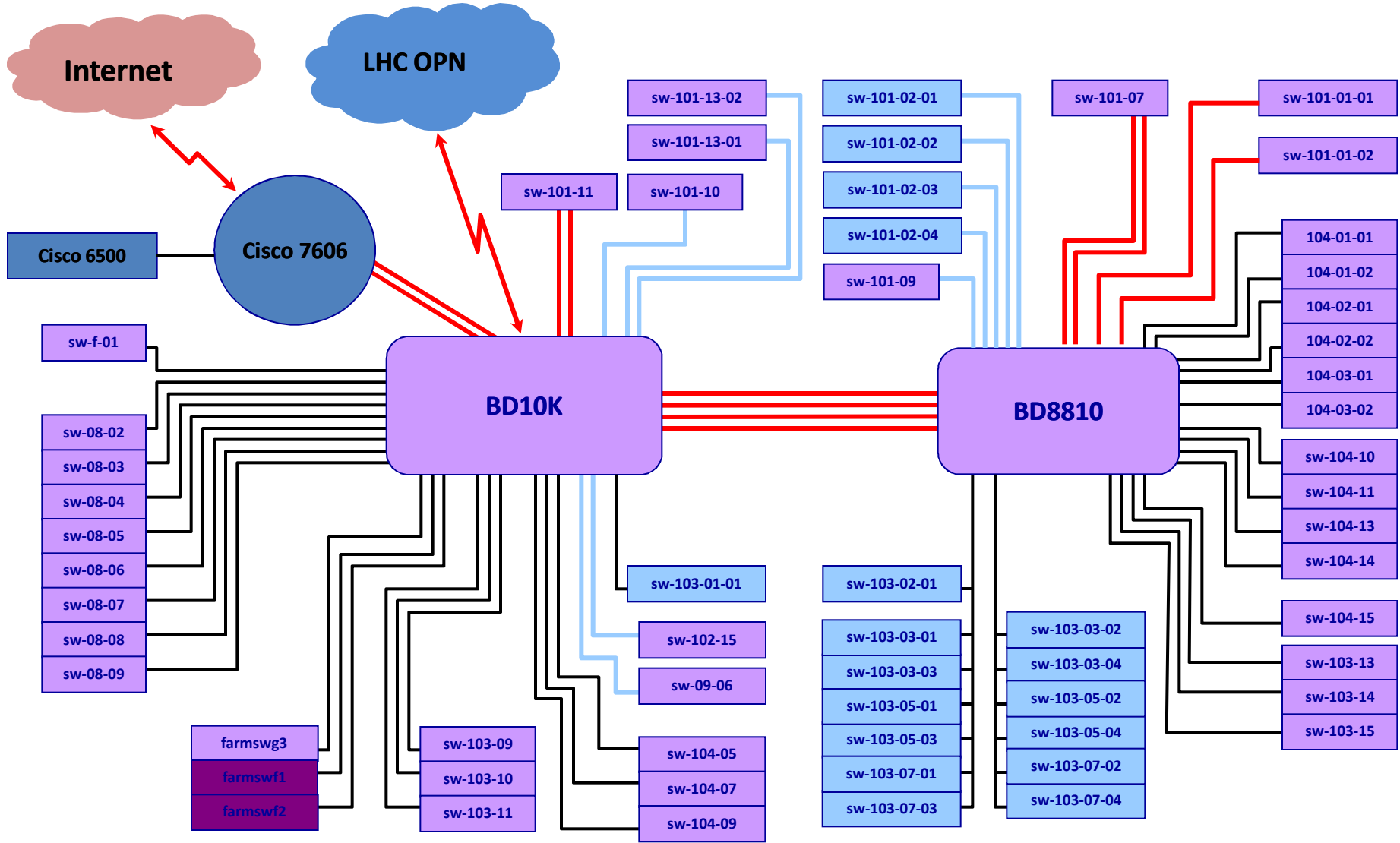
Next steps on LAN side..

- New Cisco Nexus 7000 installation as a CORE (end of January) switch for the TIER1 resources

- GridFTP Servers and SE Direct 10Gb/s CORE Connection

- Virtual Nodes on demand and their interconnection issues to be handled..

That's it

Questions?

Backup Slides

Network Layout

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