



Enabling Grids for  
E-science in Europe

*SA1 operational policy training,  
Athens 20-21/01/05*

## **Presentation of the HG Node “Isabella” and operational experience**

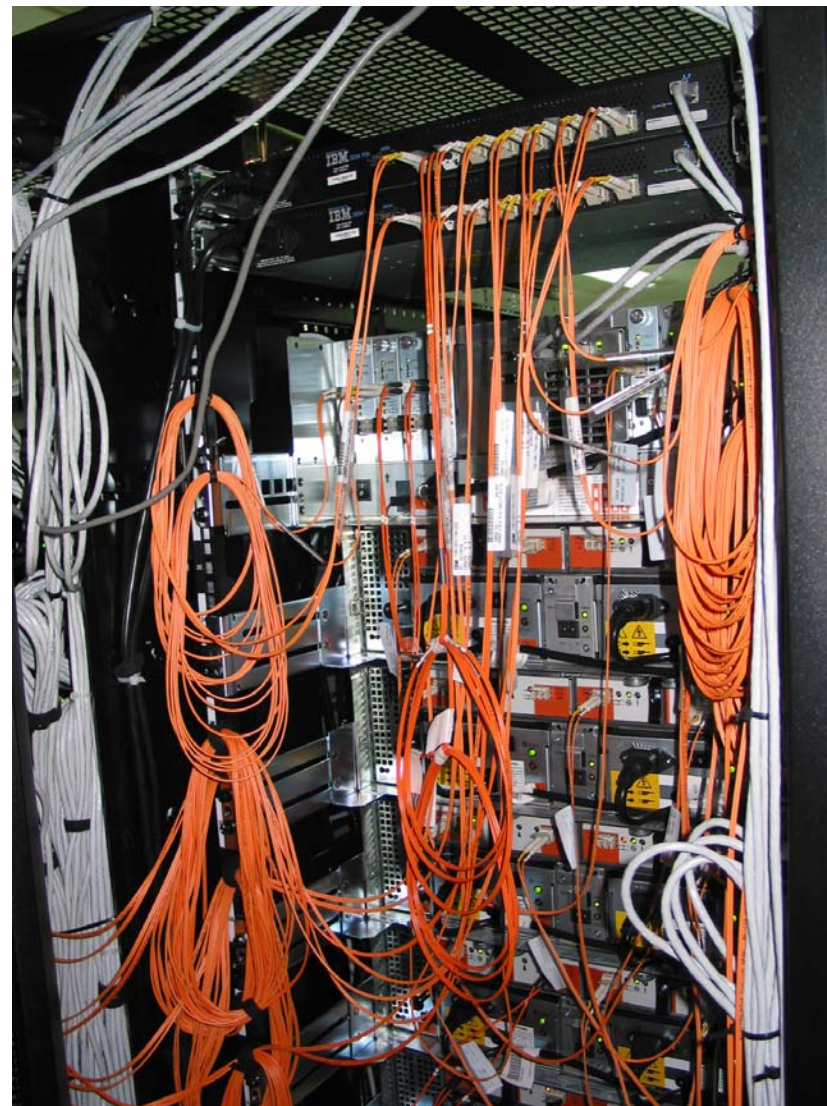
**Antonis Zissimos  
Member of ICCS administration team**



# Objectives of this session

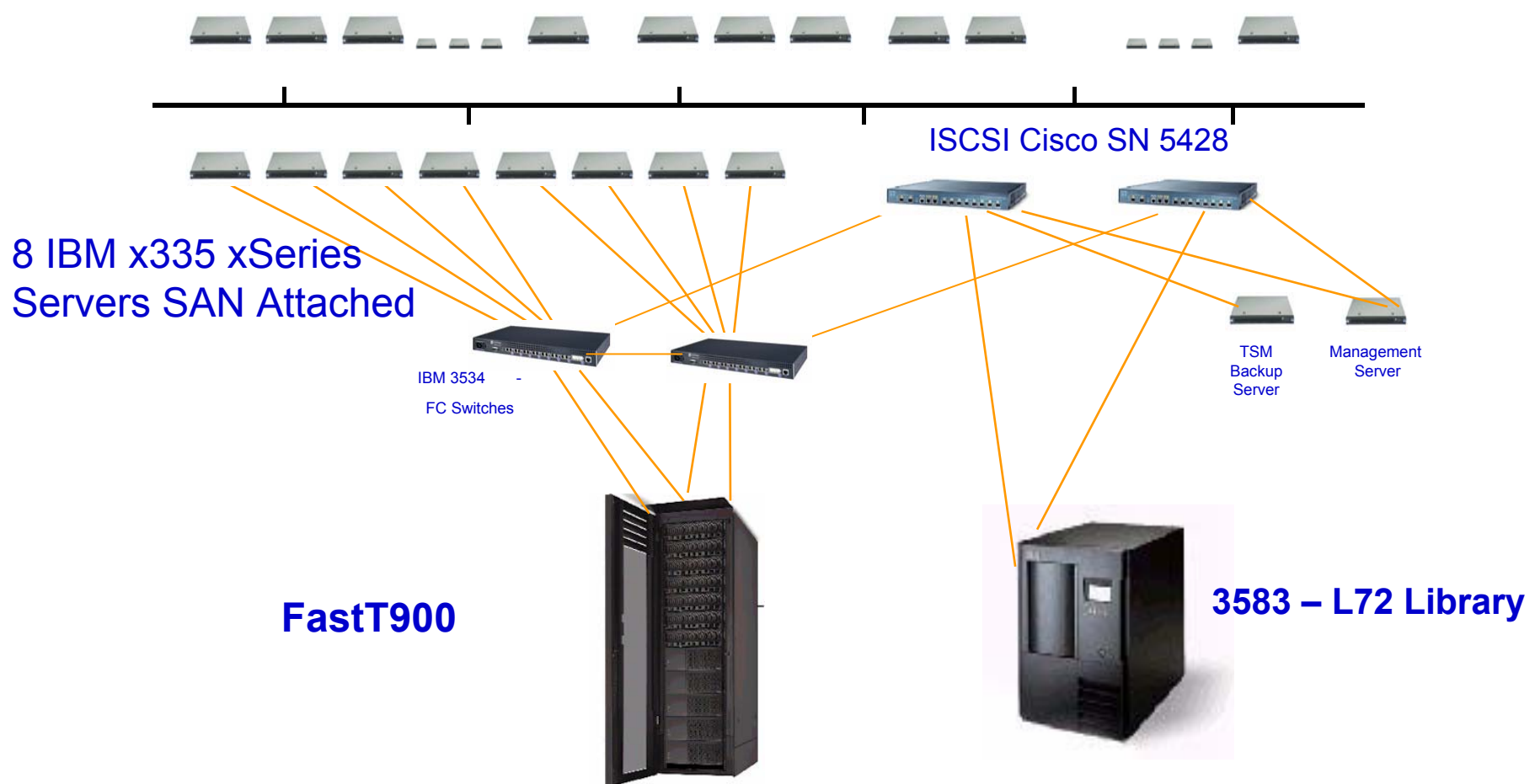
- Present the new HG-01-GRNET site
- Overview of the Configuration, services and planned services
- Overview of the Operational experience,
  - What need to be done to run a stable Grid Node
  - Upgrade it
  - Maintain it
  - Etc.

# Meet Isabella



# Meet Isabella 2

23 IBM x335 xSeries Servers



# Storage Area Network

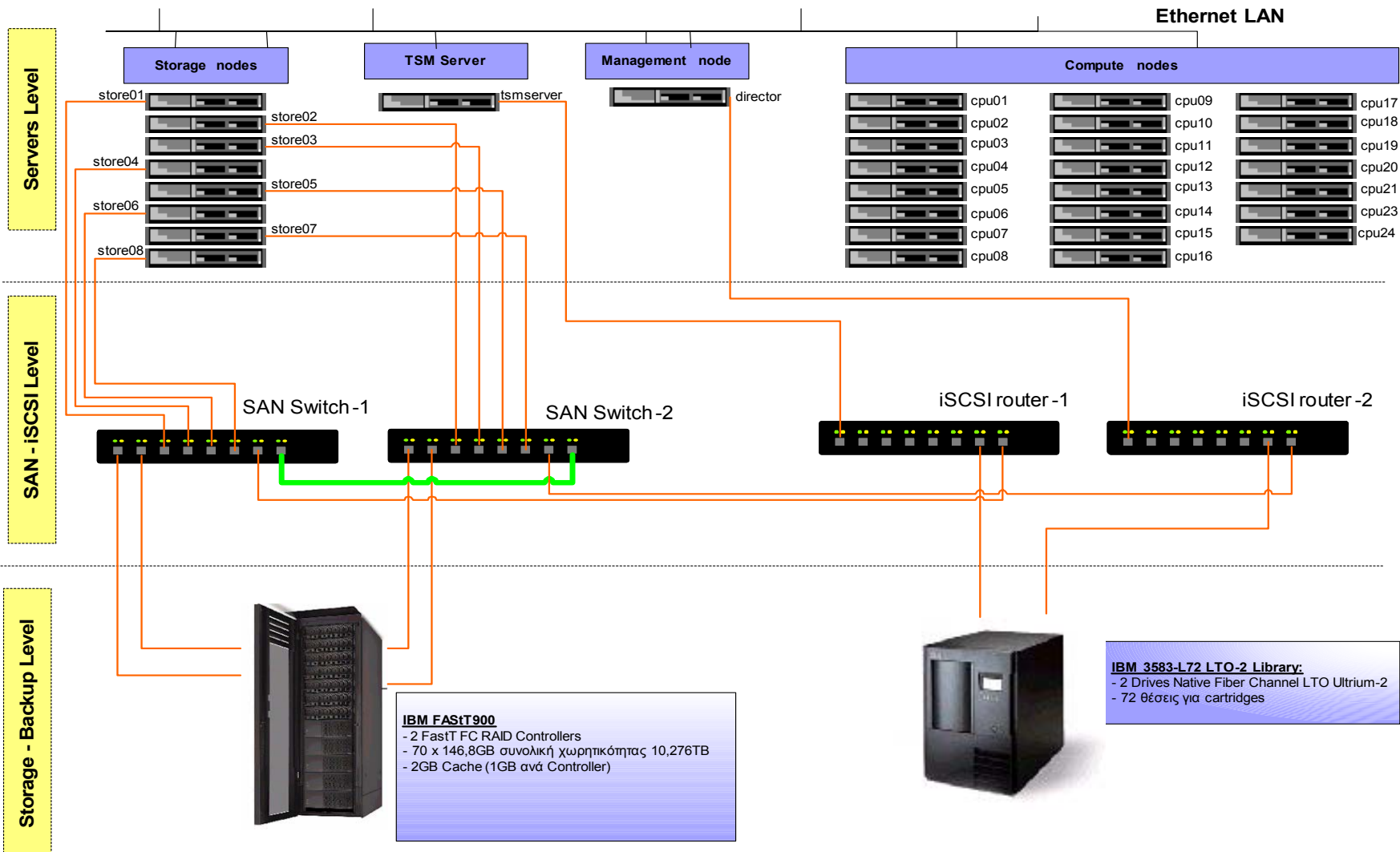
## IBM FAST900

- 2 FastT FC RAID Controllers
- Hard Disks 70 \* 146,8 GB = **10,276TB** 10K-4, 2GB FC Hot Swap2GB
- Cache (1GB per Controller)
- RAID protection 0, 1, 3, 5, 10
- Maximum Capacity **32 TB** (raw)
- Redundant hot swappable components
- LUN masking
- FlashCopy
- Fibre Channel Switches
  - 2x IBM 3534-F08 8-port 2GBps Switches
  - 200 MB/sec

# Storage Area Network

- **IBM 3583-L72 LTO-2 Library**
  - 2 Drives Native Fibre Channel LTO Ultrium-2 (6 Drives maximum)
  - 35MB/sec native or 70MB/sec compressed per Drive
  - 72 cartridges max Cartridges
  - Double Power Supply fans for redundancy.
  - Max Capacity 28,8TB Compressed.
  - Built-in Barcode Reader
  - Multiple Virtual Library partitioning

# SAN Schema

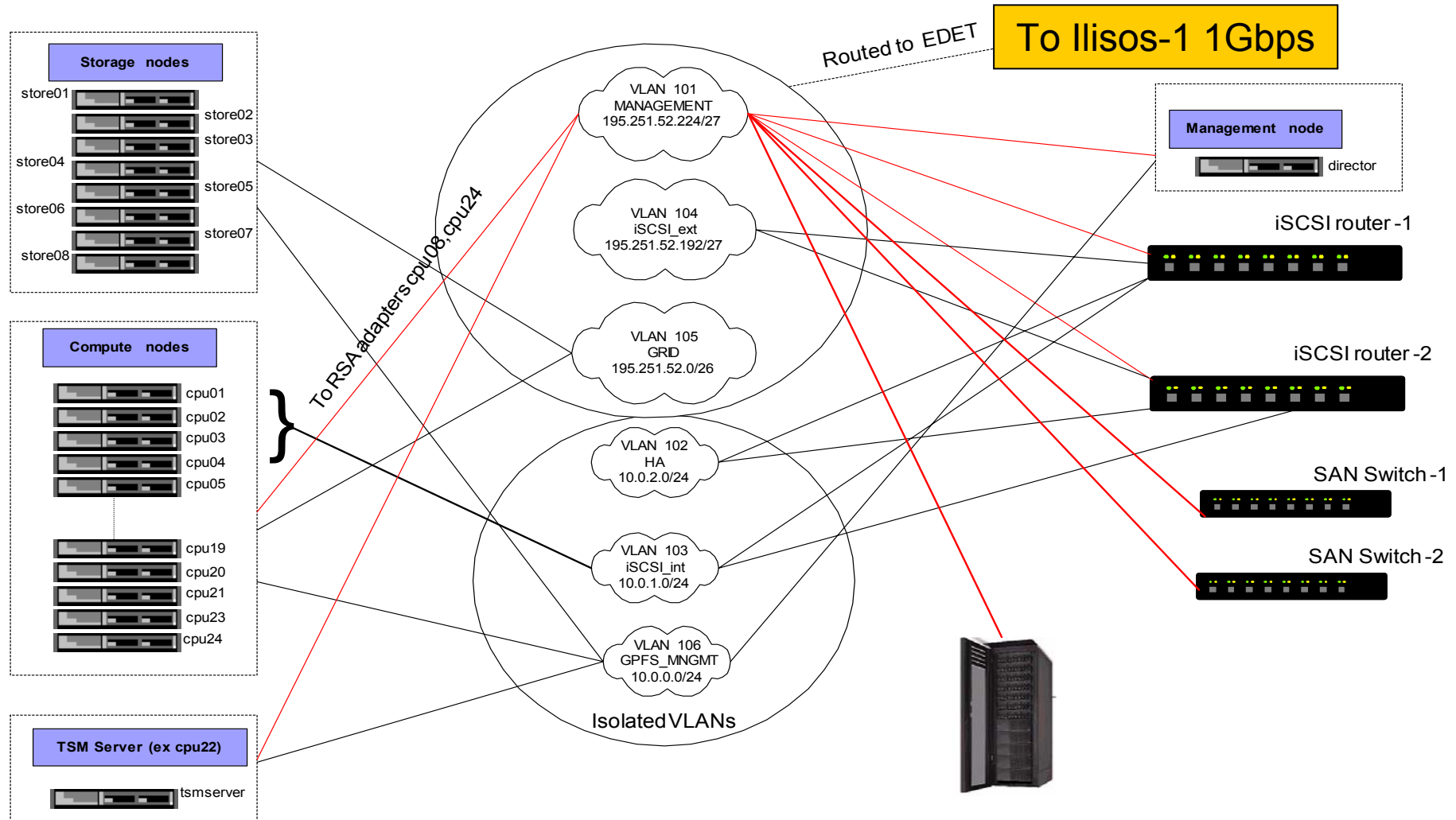


# H/W Description

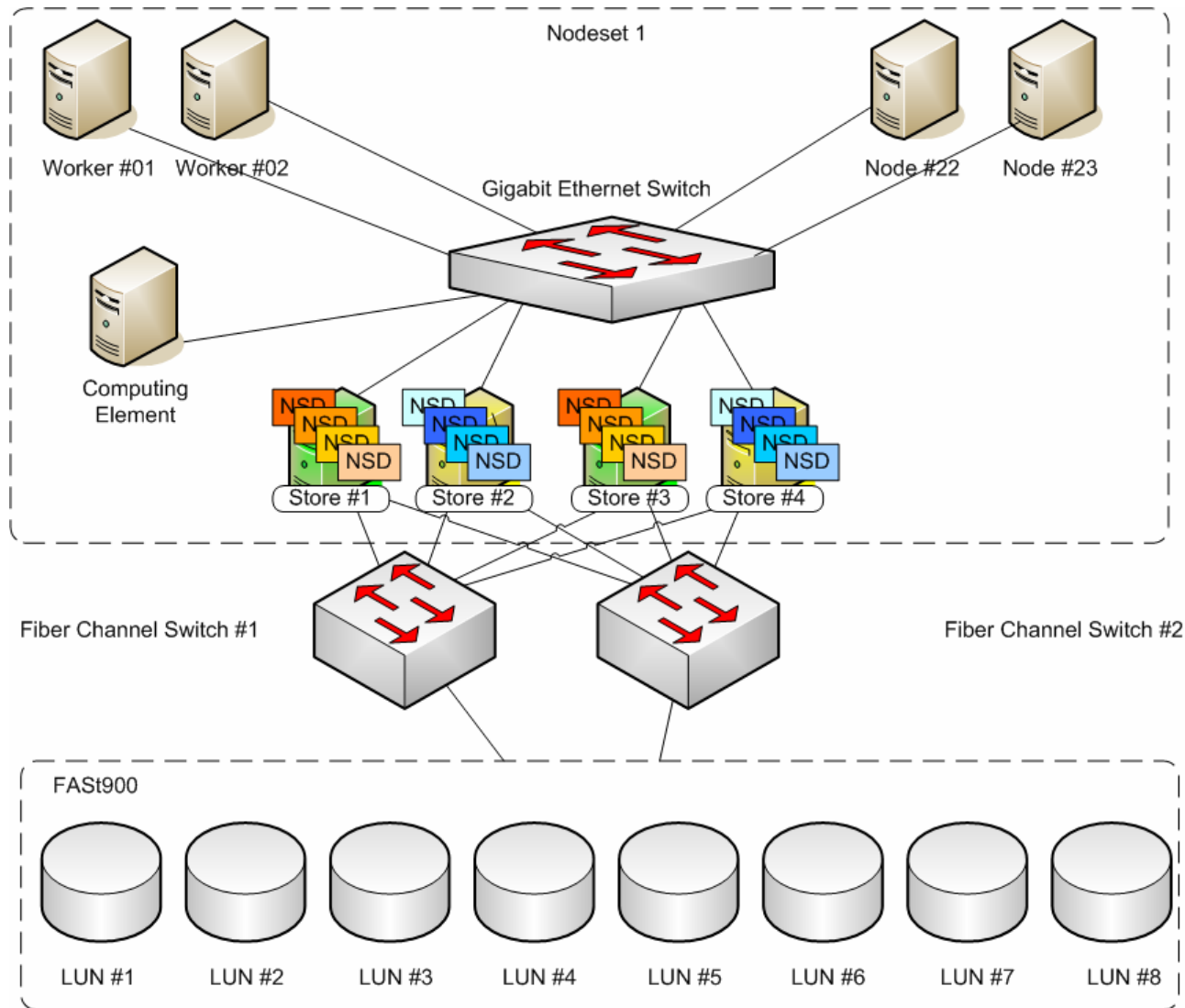
- **(32 +1) x IBM xSeries x335**
  - Dual Intel Pentium Xeon DP @ 2.8 GHz with 533MHz Front Side Bus.
  - Memory 1 GB ECC PC2100 DDR Registered @ 266MHz, With Chipkill – Two Way Interleaved technology.
  - 2 I/O PCI-X buses @ 64bit /100MHz.
  - 2 64 bit PCI-X expansion slots.
  - 2 Ultra320 SCSI HD @ 73.4GB.
  - Dual Port 10/100/1000 Mbps Ethernet controller
  - Built-in System Management Processor for Light Path Diagnostics
  - C2T Daisy Chain capability with lights-out remote control
  - 2Gbit Fiber Channel PCI-X adapter for the 8 SAN attached Hosts.



# Network



# GPFS File system



- **2 GPFS Filesystems**
  - 3TB for the Storage Element
  - 2TB for the users home directories
- Each filesystem has one primary and one secondary server
- 4 Network Shared Disks per file system
- Each NSD corresponds to an RAID 5 array on the storage
- For the small filesystem we per storage enclosure redundancy. We can't do that with the bigger filesystem

# GPFS Capabilities

- High-performance parallel, scalable file system for Linux cluster environments
- Shared-disk file system where every cluster node can have concurrent read/write access to a file
- High availability through automatic recovery from node and disk failures

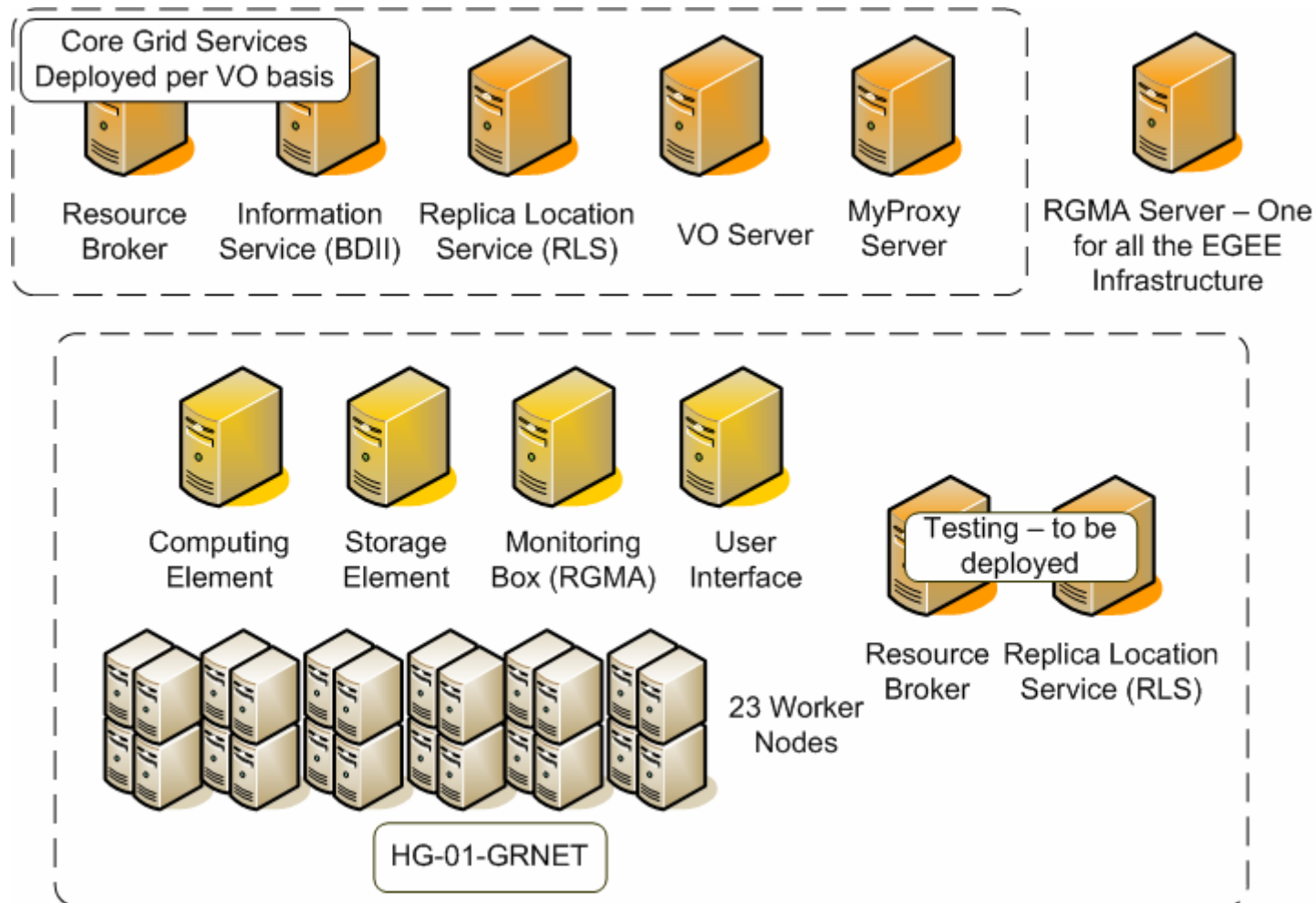
# Management of the node

- Remote Console Manager with NEtBAY console – provides KVM capabilities through encrypted TCP/IP connections
- Daisy chain for proper cable management
- Remote Supervisor Modules that can be managed through a web server
- Each server has a management interface card for hardware monitoring (temperatures and fan speeds) and power cycling

# LCG – 2 Middleware

- Currently in LCG-2 Production Service
- Currently Running:
  - A Computing Element (**CE**) with Worker Nodes (**WN**)
  - A Storage Element (**SE**) that Serves 3.2 Terabytes of Storage
  - And a User Interface (**UI**)
  - Release: **LCG-2.3.0**
  - Platform: **Scientific Linux 3.0.3** <http://scientificlinux.org>

# LCG-2 Middleware



# LCG Operations

- Many bugs found during the installation and the operations
- Some debugging will be required in order for the middleware to run
- New manual installation method using YAIM
  - Set the configuration variables correctly in the site-info.def file
  - Distribute the file to all the LCG nodes of the cluster
  - For each node run the scripts
    - Install\_node
    - Configure\_XX

# Day-to-day operations

- 09.00 – 21.00
- Monitoring the EGEE testzone report – daily basis
- GIS Monitor web page – periodic updates of the site information index which summarizes the node state
- Monitor the LCG-ROLLOUT list. Discussions about middleware releases and configuration problems
- Monitor the internal ticketing system
  - Based on Request Tracker
  - Facilitates the event tracking and problem solving
  - Each request has a unique ID, person responsible and a status (new/open/resolved)
  - All records held in a central service
- Tickets also open automatically through the IBM Director alert emails
- IBM oriented monitoring of the backup system, the network infrastructure and the GPFS



# Comments / Q & A

