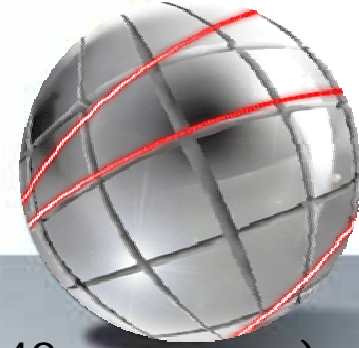# ISU DOSAR Workshop 2007

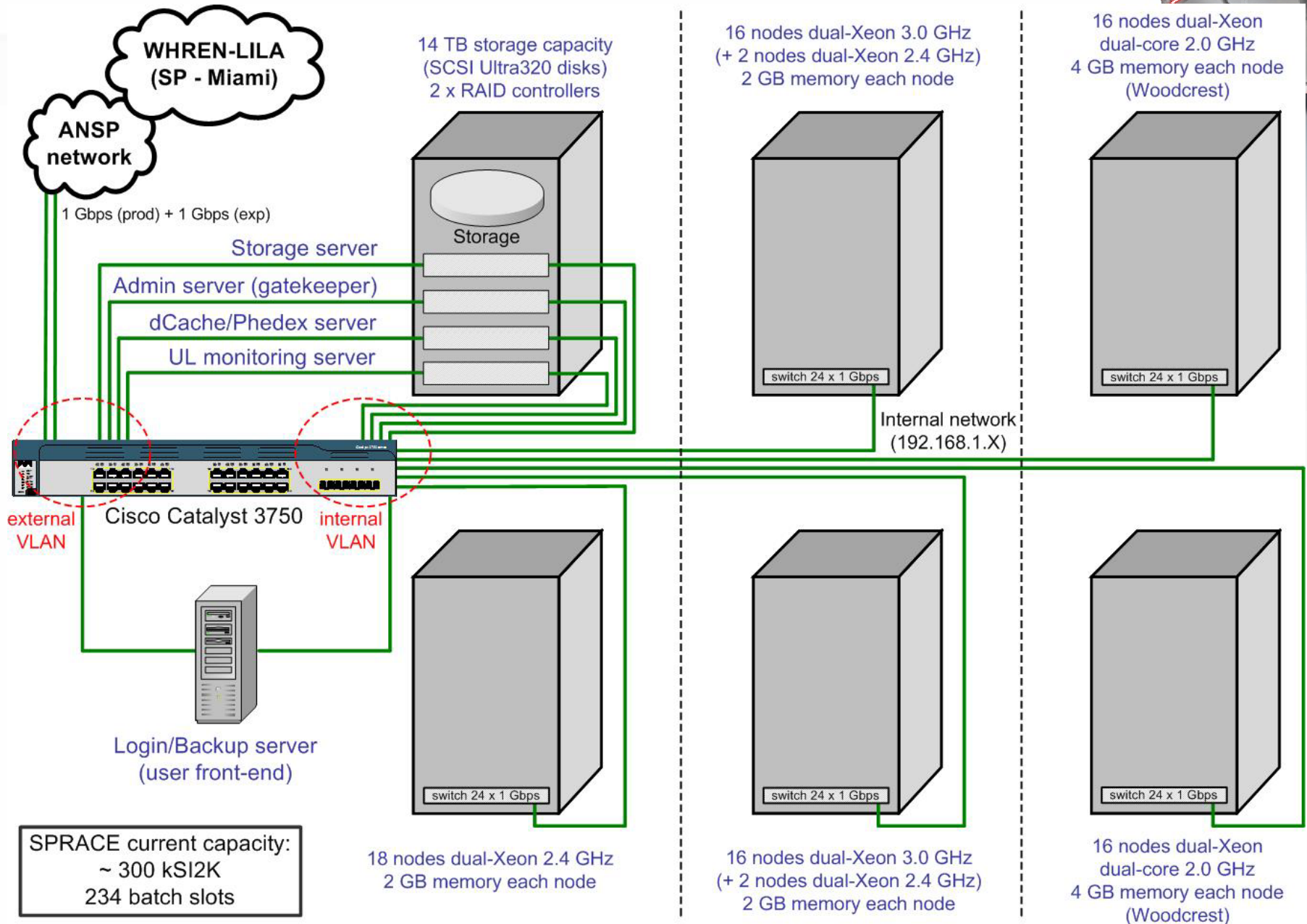## SPRACE Status Report
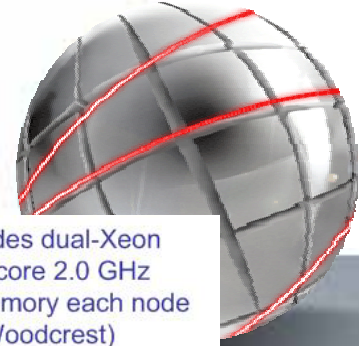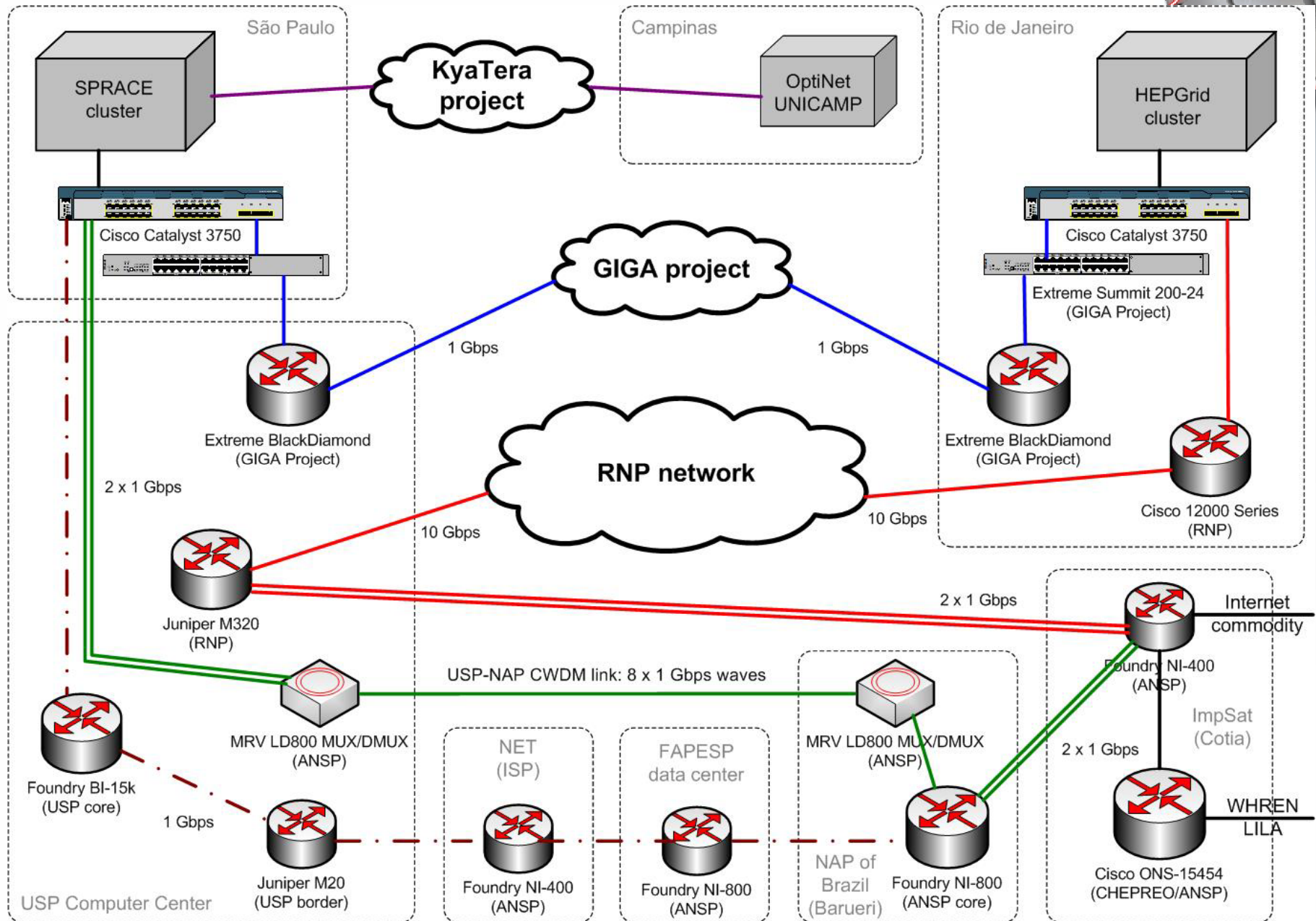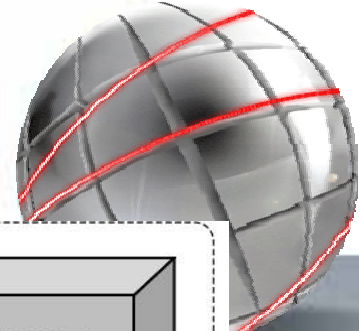### Eduardo Gregores

Who we are

- **São Paulo Regional Analysis Center**
- **The Group**
    - Sérgio Novaes   Professor
    - Eduardo Gregores   Professor
    - Sérgio Lietti   Postdoc
    - Pedro Mercadante   Postdoc
    - Rogerio Iope   System Manager
    - Marco Dias   System Manager
    - Thiago Tomei   Grad Student
    - Wescley Teixeira   Undergraduate
    - João Marques   Outreach
- **Participant Institutions**
    - Universidade Estadual Paulista (Unesp)
    - Universidade de São Paulo (USP)
    - Universidade Federal do ABC (UFABC)
- **High Energy Physics**
    - DZero Experiment since 1999.
    - CMS Experiment since 2005.
- **Advanced Networking**
    - Ultraligth Project.

- **Cluster**
    - 90 Dual/Duo Xeon (240 processors)
    - Computing Power: 300 kSi2k
    - Storage Capacity : 20 TB
- **Network Connection**
    - Direct Gigabit connection with USA (WHREN-Lila)
    - Direct Gigabit connection with HEP clusters at Rio de Janeiro (Giga)
    - Optical connection for network test bed (UltraLight/Kyatera)
- **Grid Computing Initiatives**
    - Distributed Organization for Scientific Analysis and Research (DOSAR) site
    - Open Science Grid member site
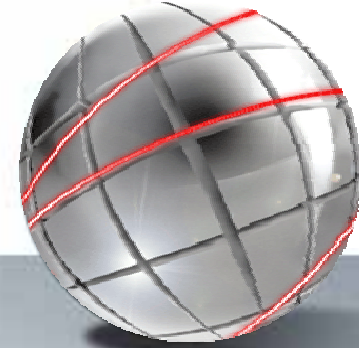   - Operating as a CMS Tier2

SPRACE Cluster Infrastructure

SPRACE Network
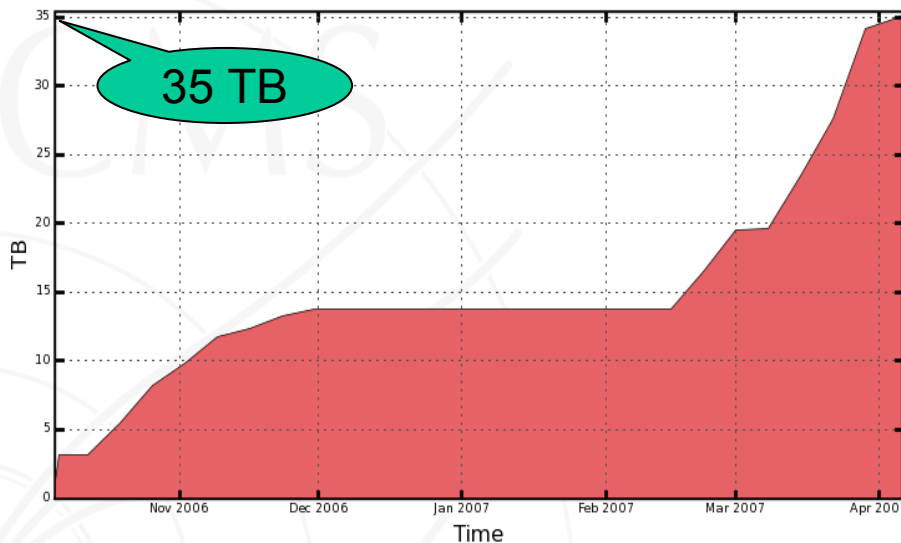
Cluster Configuration

- SL3 OS all over the cluster.

- Computing Element Configuration
  - Site Name: SPRACE
  - OSG 0.4.1 Suite
  - Gums/Prima authentication scheme
  - Condor 6.7.18 Batch System (234 Slots)
  - All services on the head-node.

- Storage Element Configuration
  - Site Name: SPRACE:srm_v1
  - SRM/dCache:
    - 4 dCache Pools of 1.5 TB each on the disk server RAID partitions.
    - All dCache Pools on a single public IP.
    - Plans to put additional pools on the worker nodes.
  - PhEDEx 2.5.0.1 installed and working
    - SRM and FTS download agents configured
  - Operating with only two servers:
    - PhEDEx, dCache and pNFS on one server.
    - All FTP doors on the disk server.
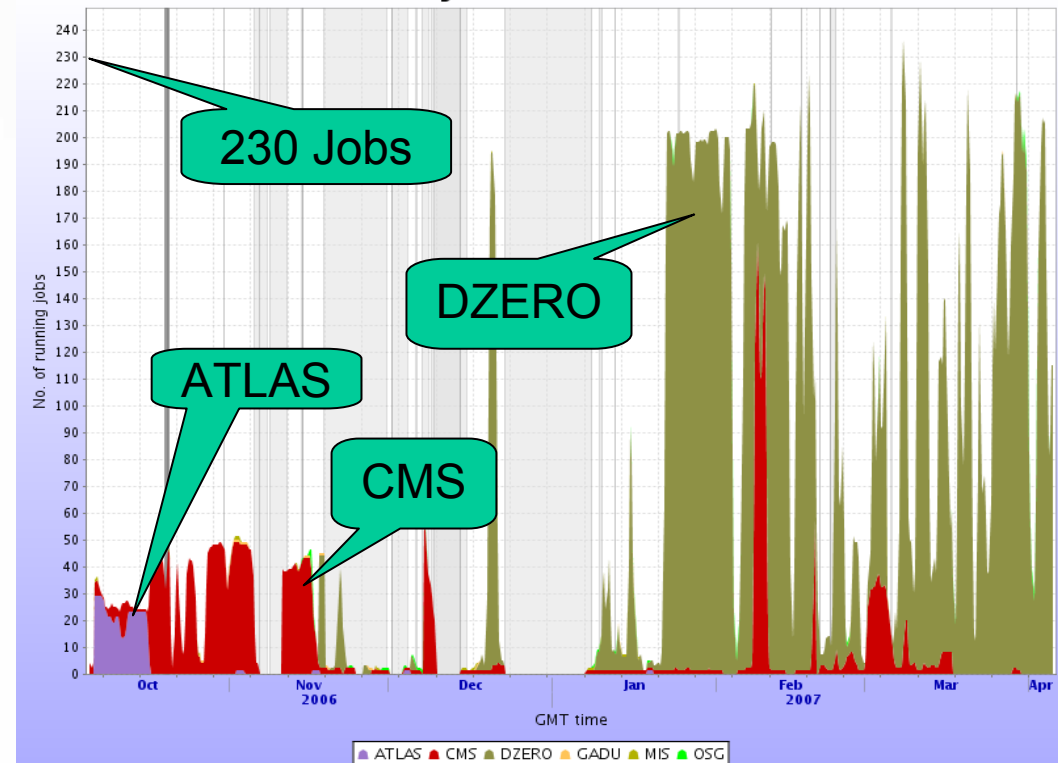
SPRACE Operations

- Operating as a democratic OSG resource: No usage policy implemented
- DZero VO:
  - Monte Carlo production and P20 data reprocessing
  - Using SamGrid → OSG forwarding with SRM/dCache as local stage
- CMS VO:
  - CMS T2 Site
  - Monte Carlo production, data analysis and data transfer exercises.
- Other VO's:
  - Negligible opportunistic use

CMS PhEDEx - Cumulative Transfer Volume
26 Weeks from 2006/40 to 2007/13 UTC

35 TB

T2_SPRACE_Buffer

Total: 34.94 TB, Average Rate: 0.00 TB/s

Jobs for SPRACE

230 Jobs

DZERO

ATLAS

CMS

No. of running jobs

GMT time

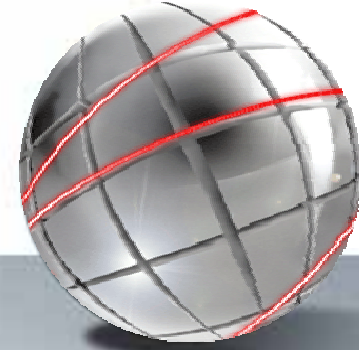ATLAS   CMS   DZERO   GADU   MIS   OSG

GridUNESP

- High Energy Physics
- Lattice QCD
- High Tc Superconductivity
- Bioinformatics
- Genomics & Cancer Studies
- Protein Folding
- Molecular Biology
- Geological & Hydrographic Modeling
- Fluid Dynamics & Turbulence
- Numerical Methods in Mechanical Engineering.

Support MCT/Finep US$ 2 M

gridunesp

Programa de Integração da Capacidade Computacional da UNESP

São Paulo State

- 1/5 Brazilian Population
  - 15 million Italians
  - 7 million Portuguese and Spanish
  - 5 million Lebanese & Syrians
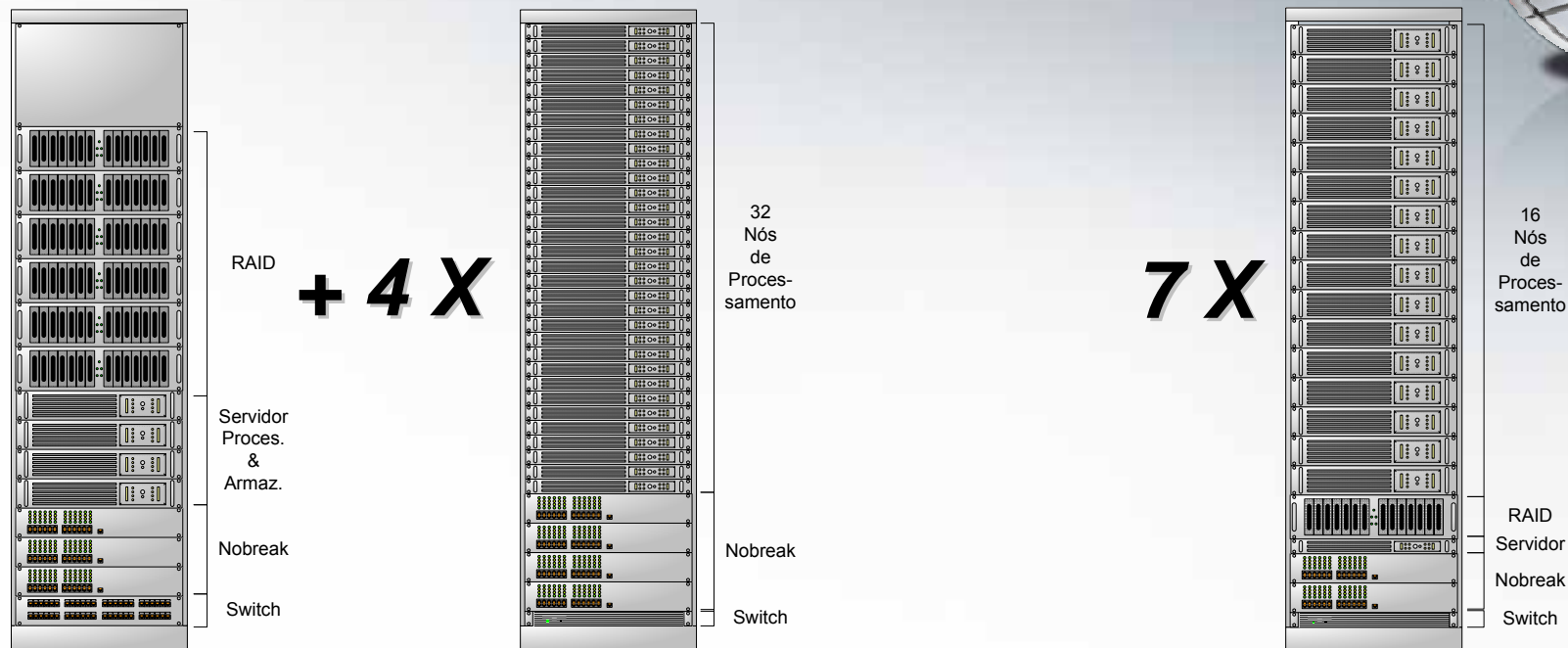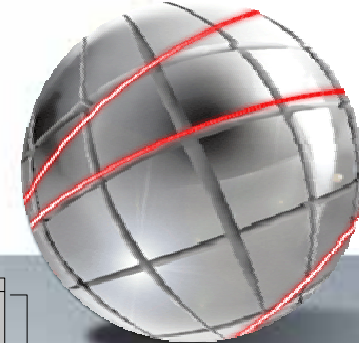 - 4 million Asians
  - 3 million Germanys

- 1/3 Brazilian Economy

- Size (250K km²) ≈ United Kingdom
- Population (40.5M) ≈ Spain
- GDP/PPP ($ 500B) ≈ 2 X Switzerland

The World Fact Book (CIA)

GridUNESP: 1,920 Processing Cores

RAID

+ 4 X

Servidor
Proces.
&
Armaz.

Nobreak

Switch

32
Nós
de
Proces-
samento

Nobreak

Switch

7 X

16
Nós
de
Proces-
samento

RAID
Servidor

Nobreak

Switch

Central Cluster
1 Processing Server + 3 Storage Servers
128 two Quad Core Intel Xeon processor (InfiniBand)
RAID: 64 X 500 GB = 32 TB

Distributed Clusters
1 Server
16 two Quad Core nodes
RAID = 4 TB

gridunesp

Programa de Integração da Capacidade
Computacional da UNESP