

São Paulo Regional Analysis Center

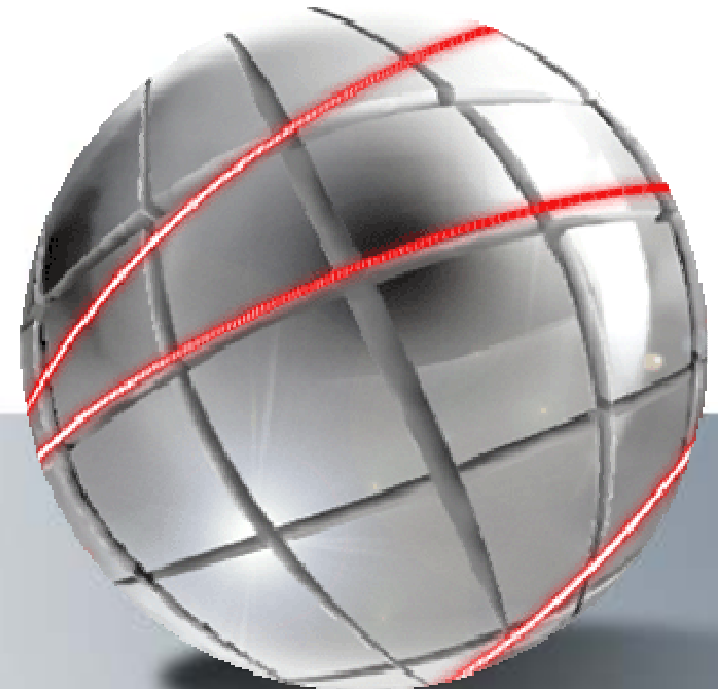
<http://www.sprace.org.br>

Site Report

DOSAR Workshop VIII

São Paulo State University

September 24, 2009



SPRACE overview



- OSG / CMS Tier-2 site
 - 240 cores (~400 kSI2K)
 - 12 TB storage
- SPRACE facilities are mainly dedicated to DZero and CMS

	Phase 1 (2004)	Phase 2 (2005)	Phase 3 (2006)
CPUs (cores)	50	116	240
Computing Power (kSI2K)	40	132	400
Storage (TB)	4	12	12

SPRACE Cluster – Phase 1



- Installed in March 2004 (Van der Graaff Building – Physics Institute at USP)
 - 1 head node (Itautec – 4 x Intel Xeon 2.4 GHz)
 - 22 worker nodes (Itautec - 2 x Intel Xeon 2.4 GHz)
 - 1 storage head node (Dell- 2 x Intel Xeon 2.4 GHz)
 - 2 storage arrays with 4 TB
 - 4 nobreaks with 3KVA each
 - 1 switch (DLink - 24 x - Ethernet 10/100/1000 Base-T)
 - 2 racks
 - Air Conditioning: 2 x 36.000BTU



SPRACE Cluster – Phase 2



- Installed in June 2005
 - 32 worker nodes (Itautec – 2 x 64Bit IntelXeon 3.0GHz)
 - 1 storage head node (Dell - 2 x 64Bit IntelXeon 3.0GHz)
 - 2 storage arrays with 8 TB
 - 4 nobreaks de 3KVA each
 - 1 switch (DLink - 24 x - Ethernet 10/100/1000 Base-T)
 - 1 switch (3com - 24 x - Ethernet 10/100/1000 Base-TX)
 - 2 racks
 - Air Conditioning: 1 x 90.000BTU



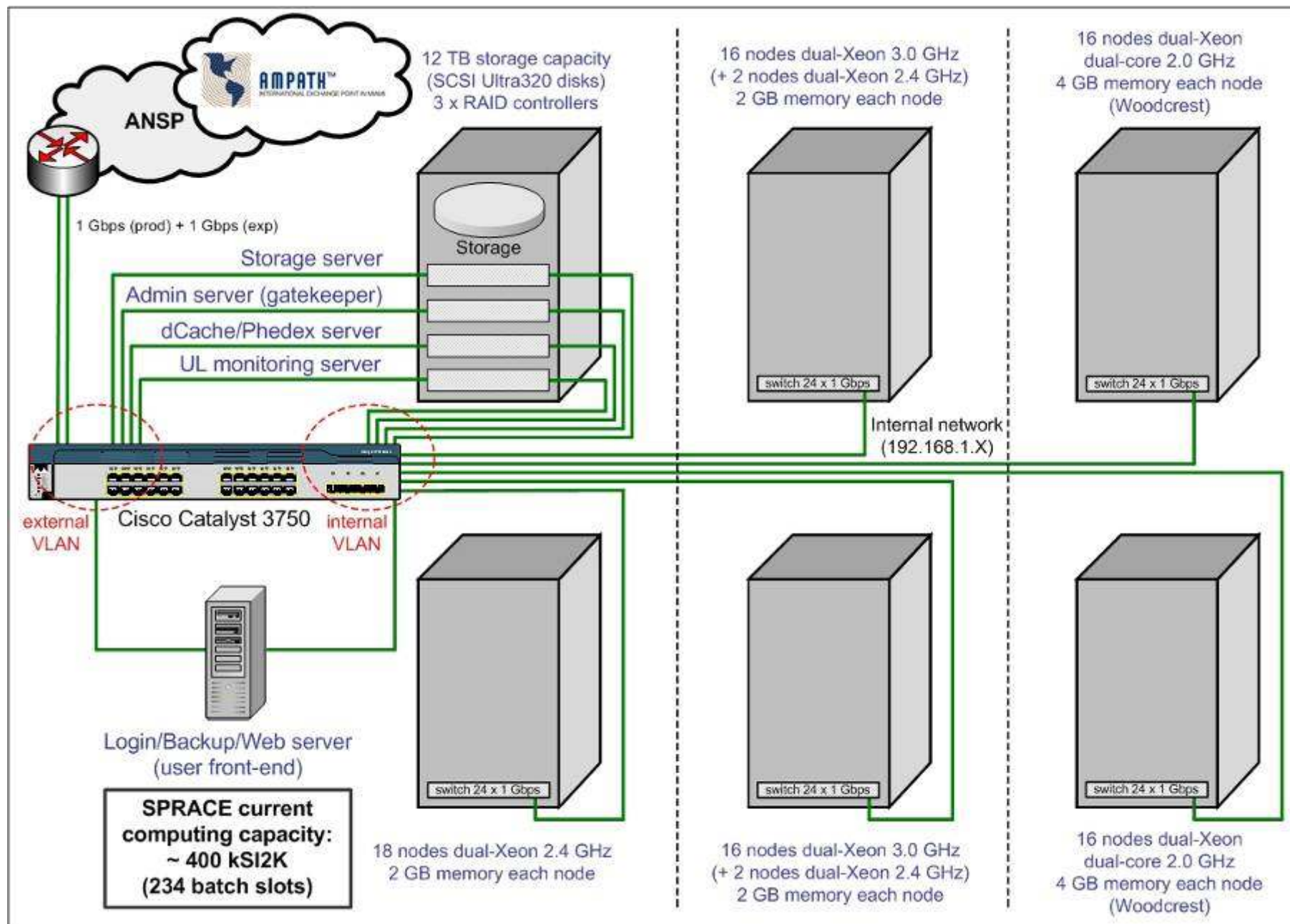
SPRACE Cluster– Phase 3



- Installed in October 2006
 - 32 worker nodes (Itautec - 2 x Intel Xeon Dual-Core 2.0 GHz)
 - 4 nobreaks with 3KVA each
 - 2 switchs (3com - 24 x - Ethernet 10/100/1000 Base-T/RJ-45 , SFP ports)
 - 2 racks.



Server / storage facilities (at present time)





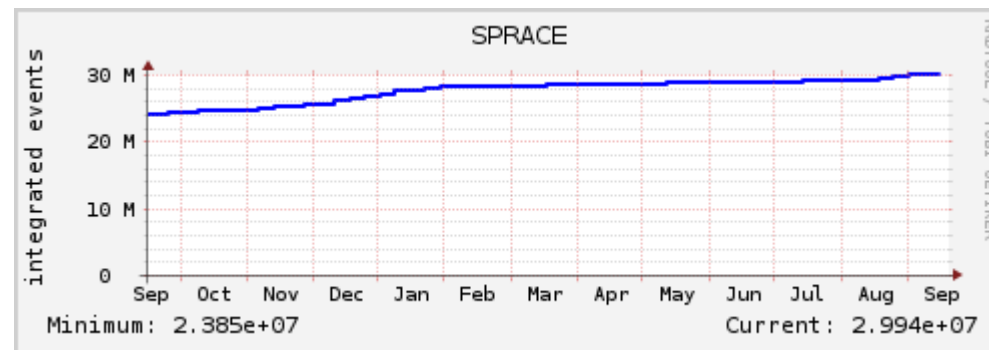
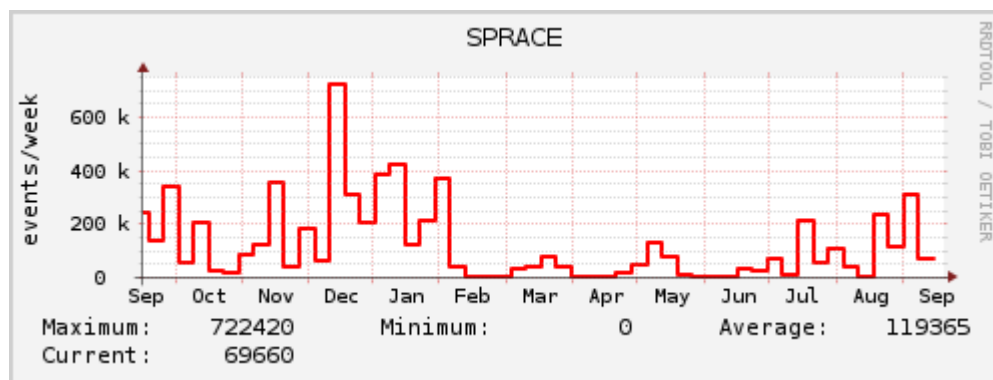
- **SPRACE Machines**

- Linux kernel of all servers (**SL4.6**) & workers (**SL 4.6 & SL5.3**)
- Computing Element: ***osg-ce.sprace.org.br*** (4 cores, 4 GB mem) ← OSG 1.0.0
- Storage Element: ***osg-se.sprace.org.br*** (4 cores, 4 GB mem) ← dCache 1.9.0-10
- Storage services split into two servers:
 - ✓ ***spraid01.sprace.org.br*** (2 cores, 2 GB, 4 logical units of storage)
 - ✓ ***spraid02.sprace.org.br*** (2 cores, 4 GB, 2 logical units of storage)
- DNS configuration
 - ✓ Domain ***sprace.org.br*** registered with local accredited domain name registrar
 - ✓ Server ***ns.sprace.org.br*** officially recognized as the primary authoritative DNS

SPRACE Production



- SPRACE can run jobs for the following OSG VO's:
 - atlas, cdf, cigi, cms, compbiogrid, des, dosar, dzero, engage, fermilab, fmri, geant4, gpn, grase, gridex, gugrid, i2u2, ilc, ligo, mariachi, mis, nanohub, nwigc, nysgrid, ops, osg, osgedu, sbgrid, sdss, star
- Main users:
 - ligo, uscms0#, samgrid
- Contribution to CMS:
 - Few production jobs via grid due to small storage capacity
 - Phase-space grid production jobs for alpgen MC events
- Contribution to DZero:
 - MC Production (thanks to Joel)
 - Almost 6M events last year



SPRACE Future Plans



- Hardware upgrade: **urgent!**
 - Storage capacity must be increased
 - Computing power needs to be increased too
- Upgrade planned for 3rd quarter – 2009 (Phase 4)
- Financial support already approved
- Storage already bought (waiting)
- Contacting vendors for Servers

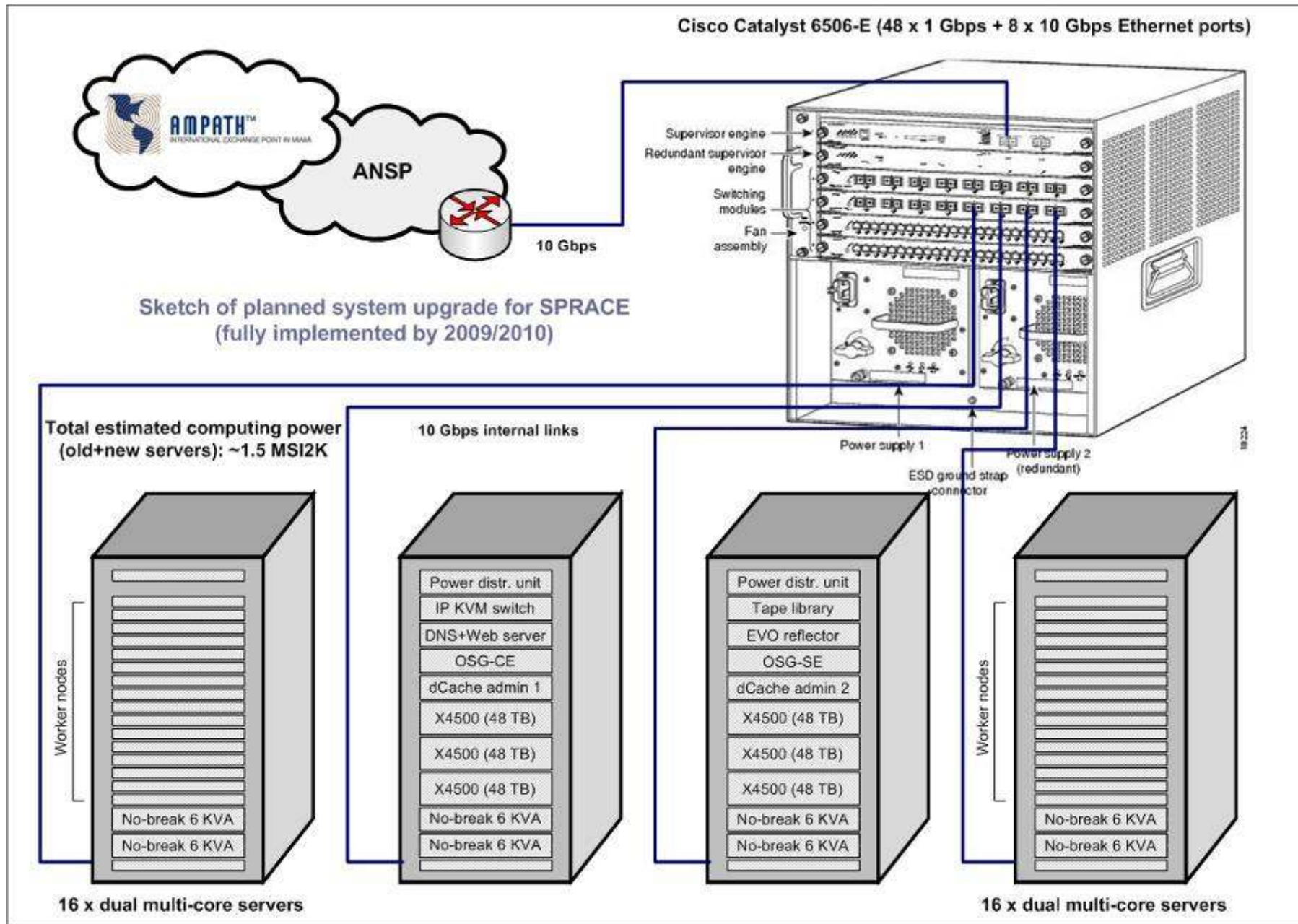
	Phase 1 (2004)	Phase 2 (2005)	Phase 3 (2006)	Phase 4 (2009- 2010)	Phase 5 (2010- 2011)
CPUs (cores)	50	116	240	~370	~500
Computing Power (kSI2K)	40	132	400	~800	~1200
Storage (TB)	4	12	12	~150	~300

SPRACE Upgrade – Phases 4 (2009) and 5 (2010)



- **Phase 4 - Installation planned for 2nd quarter of 2009**
 - 4 head node (2 x QuadCore processors – 24 or 32GB RAM)
 - 16 worker nodes (2 x QuadCore processors – 16GB RAM)
 - 3 SUN Thumpers X4500 (48 TB each)
 - 1 switch Cisco 6506E
 - 2 racks
- **Phase 5 - Installation planned for 2nd quarter of 2010**
 - 2 head node (2 x QuadCore processors – 24 or 32GB RAM)
 - 16 worker nodes (2 x QuadCore processors – 16GB RAM)
 - 3 SUN Thumpers X4500 (48 TB each)
 - 2 racks
- **Software Upgrade for Production Servers (during phase 4)**
 - OS upgrade to RedHat 5 64-bit based distribution (SL or CentOS)
 - Phase 1 servers (old 32-bit machines, less than 5% of total computing power) will be discontinued and used for auxiliary services

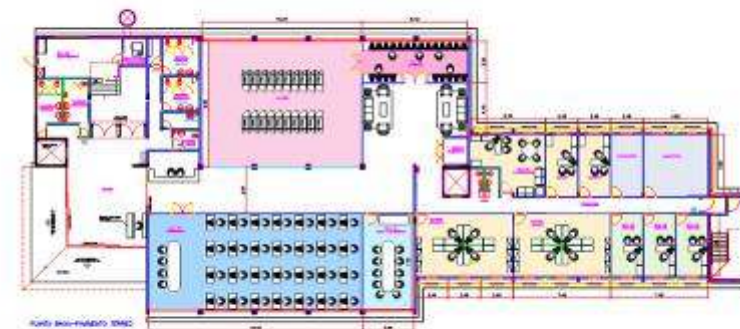
Server / storage upgrade planning



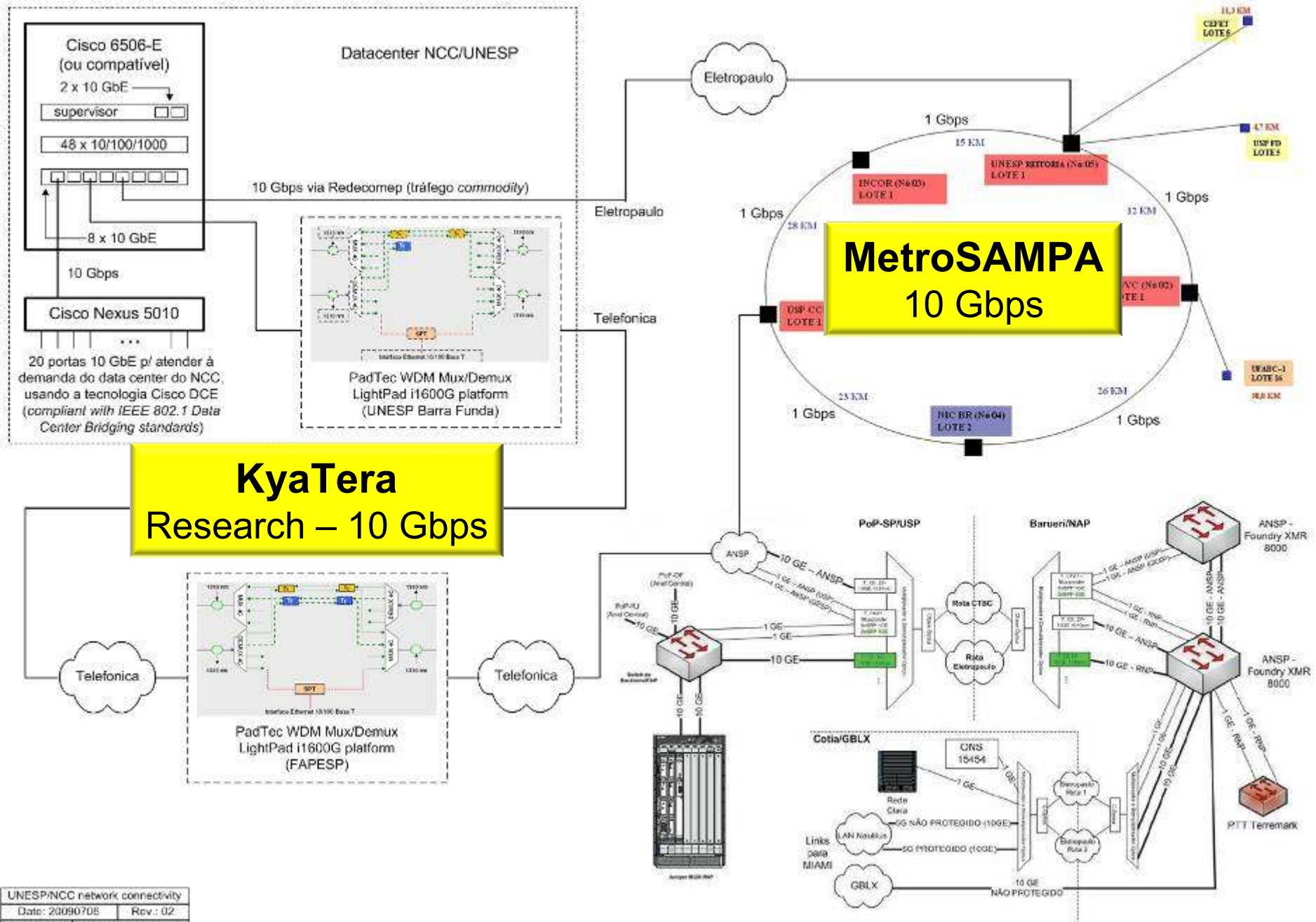
SPRACE Cluster – New Location



- Physics Institute at USP Van der Graaff building had no space for the upgrade
- SPRACE cluster was moved last week to GridUNESP Data Center at UNESP Barra Funda Campus
- The GridUNESP Data Center (pink room) has an area of 100 m²



Barra Funda: Network Infrastructure



GridUNESP Data Center and Auditorium



Data Center Room – March 2009



Data Center Room - Today



Auditorium – March 2009



Auditorium - Today



Nucleo de Computação Científica - UNESP









