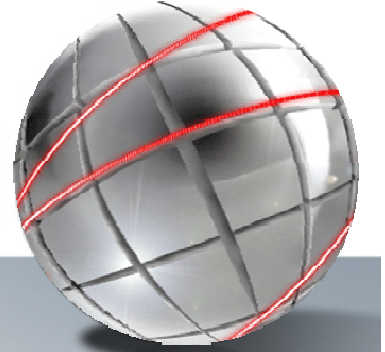
São Paulo Regional Analysis Center

http://sprace.if.usp.br

SPRACE Status Report

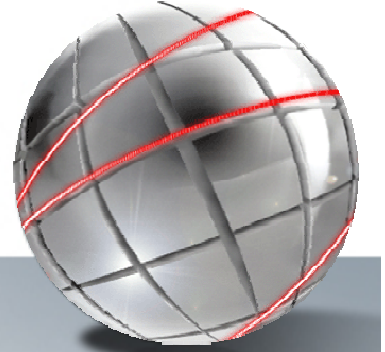
22/Aug/2006

Who We Are Now



- São Paulo High Energy Physics Group
  - Sérgio Novaes — Professor at UNESP (coordinator)
  - Eduardo Gregores — Professor at UFABC
  - Sérgio Lietti — Postdoc at UNESP
  - Pedro Mercadante — Postdoc at UNESP
  - Alexandre Alves — Postdoc at USP
  - Gustavo Pavani — Postdoc at UNESP
  - Rogerio Iope — Graduated Student / System Manager at USP
  - Thiago Tomei — Graduated Student at UNESP
  - Marco Dias — System Manager at UNESP
  - Wescley Teixeira — Undergraduate Student at USP
- DZero Experiment (Active since 1999).
  - Hardware: Forward Proton Detector
  - Analysis: New Phenomena (Search on Large Extra Dimensions).
  - Distributed Computing Infra-Structure (SAM and SAMGrid).
    - Started official Monte Carlo production on 2004.
    - More then 10 Million events produced so far.
    - Operational SAMGrid site since 2005.
- CMS Experiment (Active since 2005).
  - LCG computing element as a CMS T2 under OSG.

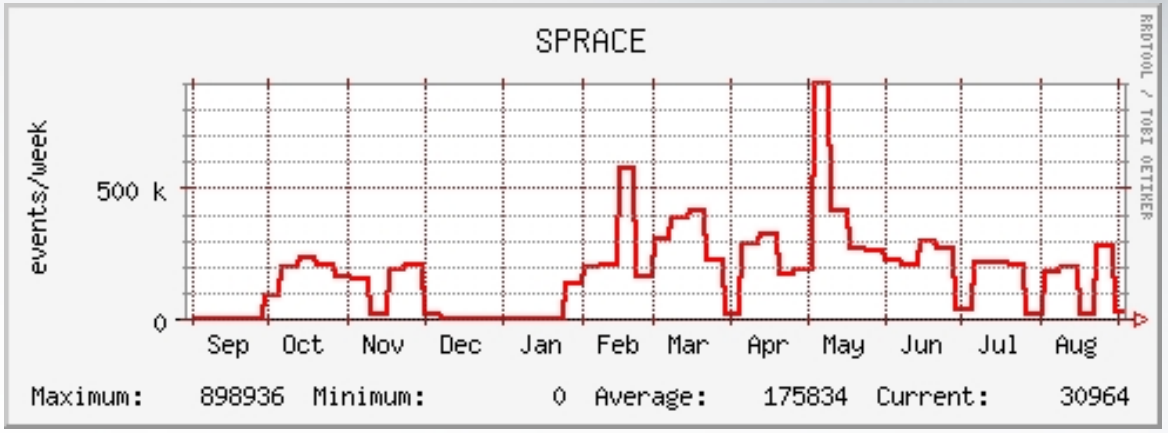
SPRACE Computing Infrastructure

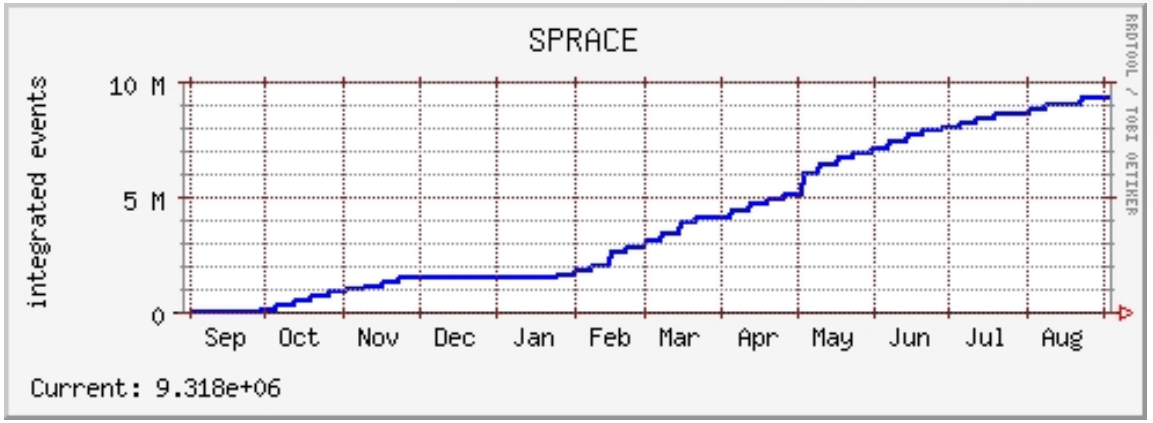


- SPRACE Cluster:
  - 20 dual Xeon 2.4 GHz 1GB workers since March 2004.
  - 32 dual Xeon 3.0 GHz 2 GB workers since June 2005.
  - 32 dual Xeon dual Core (Woodcrest) 2.4 GHz 4GB workers this week.
  - 2 head nodes (SAMGrid + OSG), 1 disk server, 1 dCache server.
  - 12 TB on 4 RAID modules (SCSI Ultra 360 10K).
  - 232 Condor batch slots with 320 kSpecInt2k of overall computing power.
  - Extra 16 TB on local disks to be deployed soon, making 28 TB total.
- SPRACE Connectivity:
  - Internal Gigabit connection between all cluster elements.
  - Gigabit connection shared with USP up to WHREN-LILA Giga link to Abilene.
  - Exclusive Gigabit Lambda on the next couple of weeks (1.2 → 2.5 Gbps).
- SPRACE Configuration:
  - 2 Separated Clusters
    - Dzero/SamGrid Cluster
    - CMS/OSG Cluster

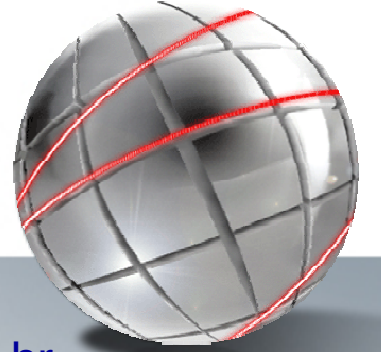
SamGrid at SPRACE

- SamGrid Cluster
  - RH 7.3 on all SamGrid computing elements.
  - 1 Head Node (SamStation and JIM suite)
  - 31 workers on Condor pool.
- Monte Carlo Production for DZero





OSG/CMS Setup at T2_SPRACE



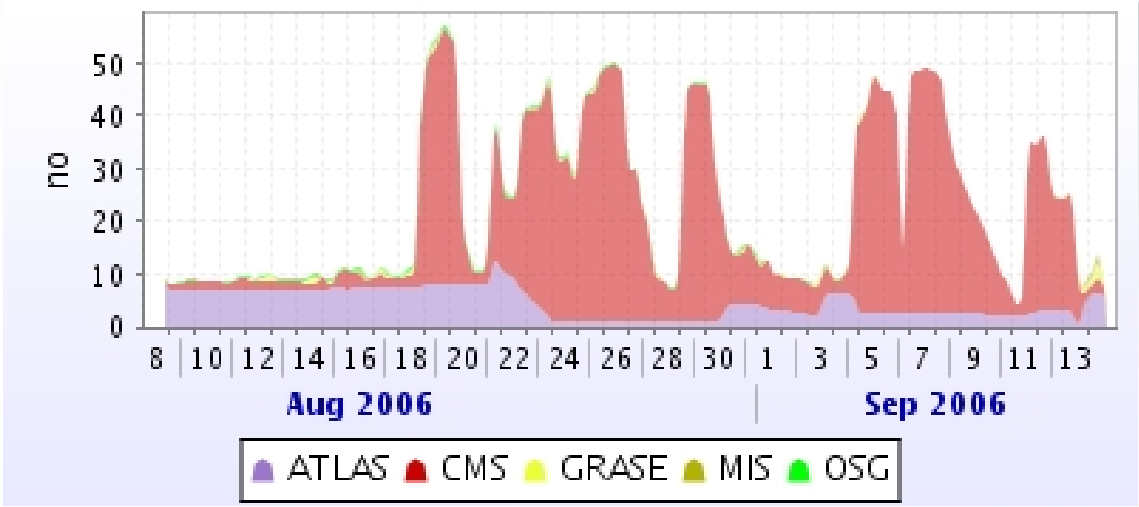
Compute Element

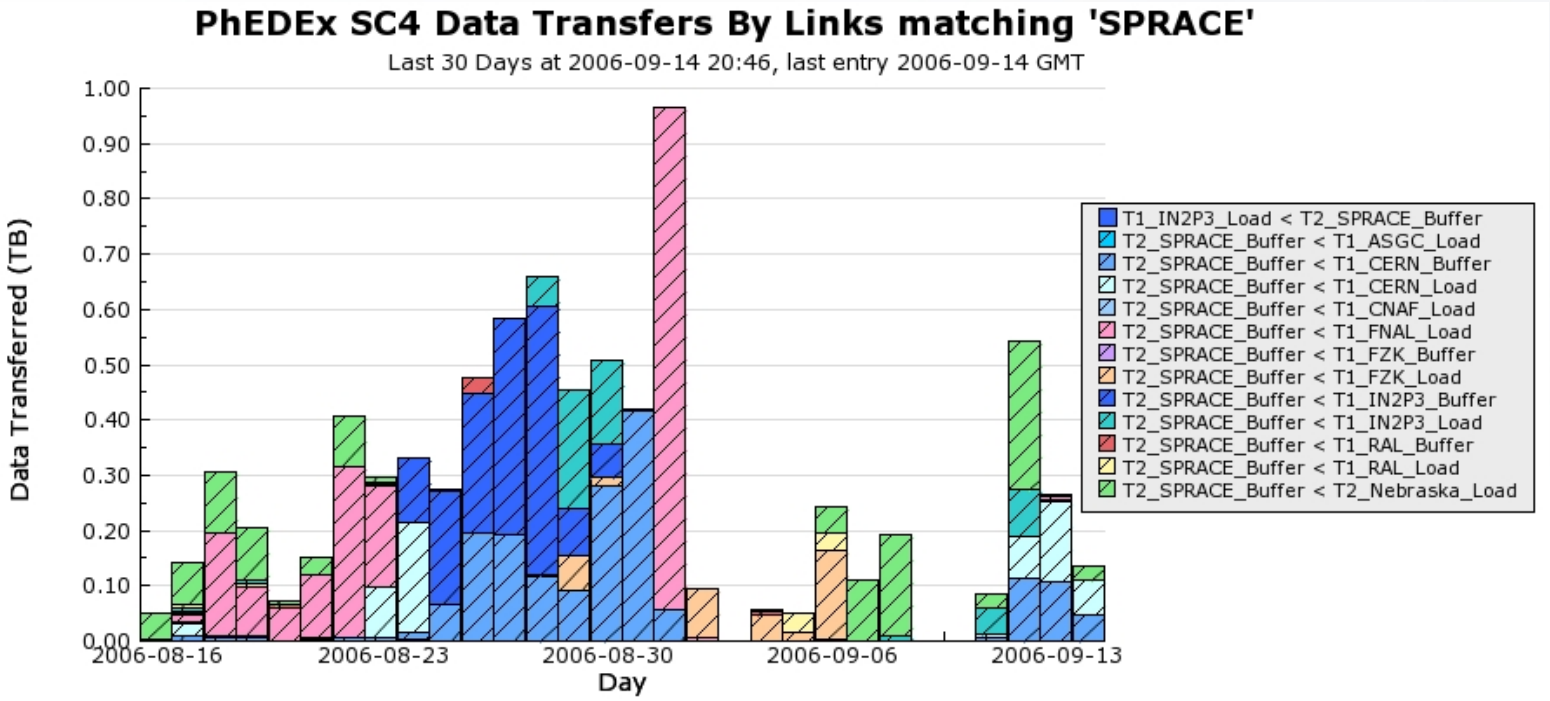
- Head Node: spgrid.if.usp.br
  - OSG 0.4.1
    - Globus – Basic grid job handling system.
    - Monalisa – Monitoring tool.
    - GUMS/PRIMA – Grid User Membership Service. Maps and authenticates VO registered users to local accounts.
    - GIP – OSG Generic Information Provider based on the GLUE schema.
    - BDII – Berkeley Database Information Index for LCG interfacing
  - Condor Batch System. Distribute jobs to the workers.
  - Ganglia: Cluster monitoring system
  - NFS: Exports OSG and Condor to the Workers
- Work Nodes:
  - 21 Workers
  - NFS access to OSG, Condor and VO's Application area.
  - Work done on local scratch partition.

Storage Element:

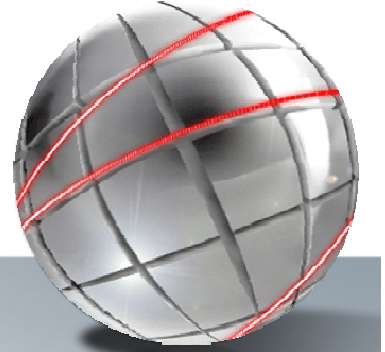
- Head Node: spdc00.if.usp.br
  - PNFS: Locally Distributed File System
  - dCache: Local Storage File Catalogue System
  - SRM: Local Storage Resources Management System
  - Phedex: CMS File Transfer and Catalogue System
  - Squid: CMS Calibration Database System for analysis jobs.
- dCache Pool Nodes:
  - Each node runs its own transfer agent and has its own WAN IP for overall enhanced connectivity.
  - dCache-pool and SRM clients.
  - File Server: spraid.if.usp.br
    - Raid arrays server (12 TB).
    - Exports VO's Application area to all cluster
  - Work Nodes: spdcNN.if.usp.br
    - Uses Compute Element Worker Nodes hardware
    - Local dedicated high capacity SATA disks.

OSG Jobs and Data Transfers





SamGrid – OSG Integration



- Only one cluster for both Grid Infrastructures
- One head fits all
  - Compatible up to OSG-0.2.1
  - Don’t work: VDT versions are now incompatibles
- A two headed cluster.
  - One head node for SamGrid (like the present one)
  - Local batch submition to OSG Condor pool.
  - Could not make it work: Condor versions incompatibilities.
- Forwarding SamGrid -> OSG station.
  - One per region (OSG-OUHEP for the Americas, CCIN2P3 for Europe)
  - About 3 GB download per batch slot from the station.
  - Download of 700 GB to fill our farm!
  - Solution: Local stager on a VOBox.
  - Under implementation with help of SamGrid people.