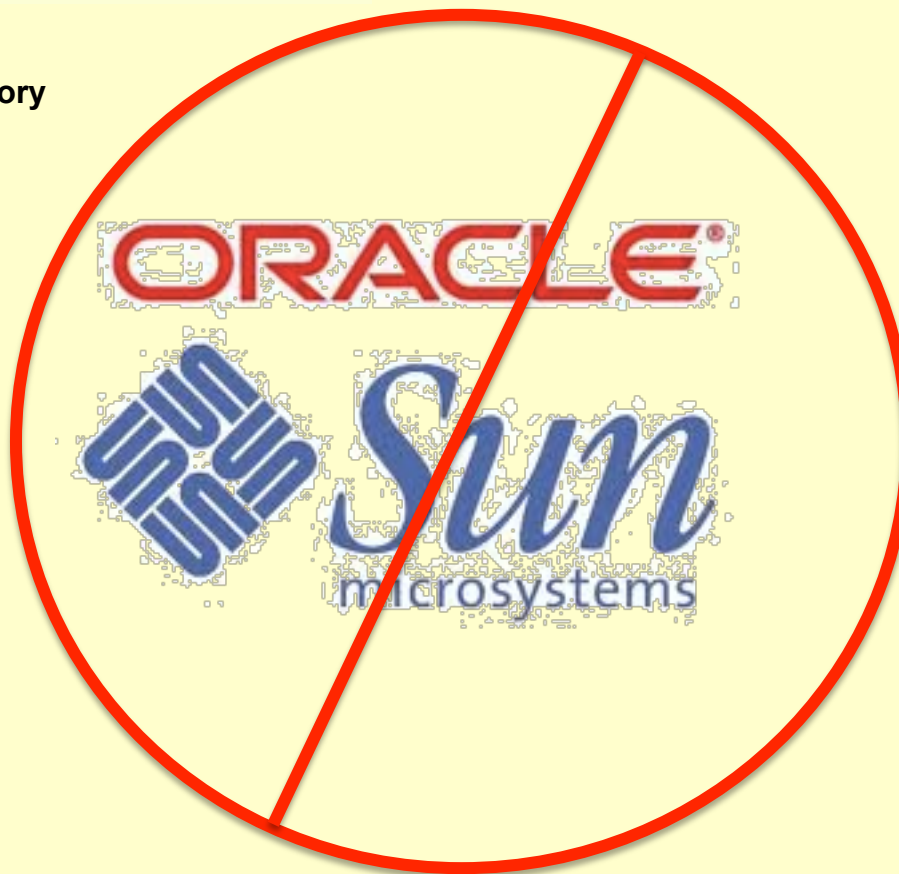




Fermi Large Area Telescope

Collaboration Computing

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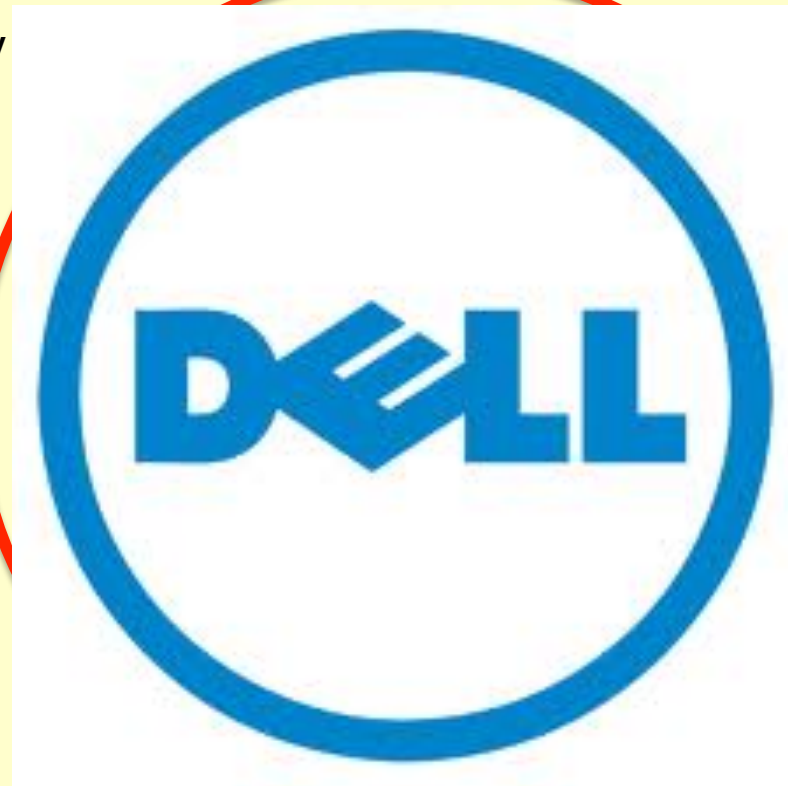




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The Computing Model

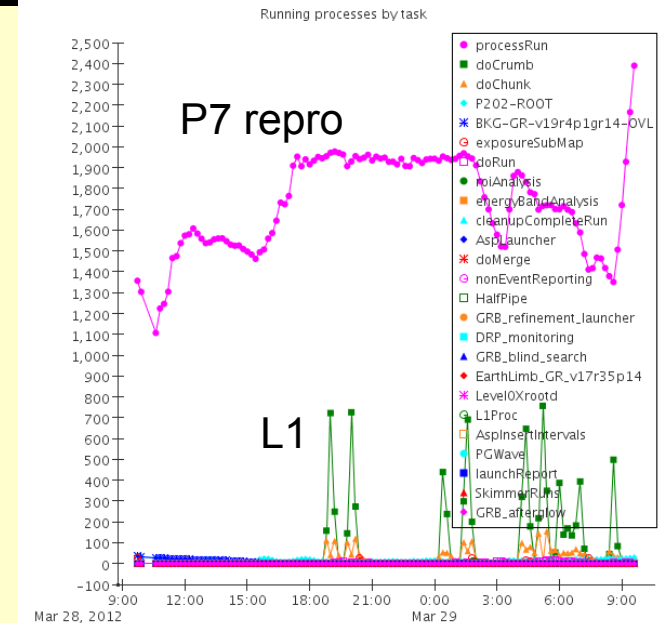
- **“Core” computing**
 - **Direct IFC support**
 - **Level 1 data processing, reprocessing & ASP at SLAC**
 - **All latest data on disk + copy of all versions on tape**
- **Simulations for Collaboration analyses**
 - **Done at SLAC, Lyon and some at INFN GRID**
 - **In support of science analyses: Pass7, Pass8 etc**
- **Big Picture Plan**
 - **Pass7 reprocessing underway: ~3 months + 1 PB files**
 - **MC for Pass8 development: not defined yet, but presumably hefty**
 - **Pass8 reprocessing: early-mid 2013**



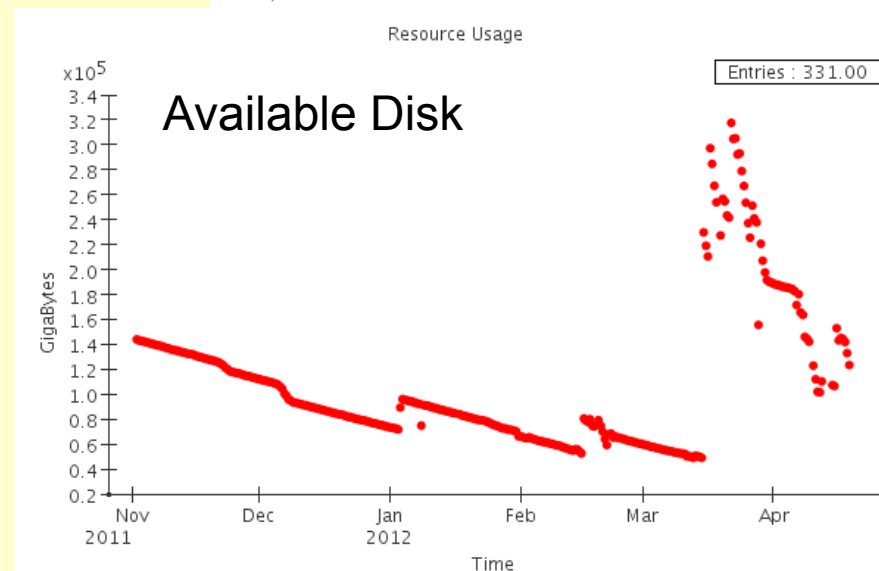
Resource Usage of Late

Showing top 25 of 27 tasks active in time period.

- **Not much simulation after massive runs of first half of 2011**
 - **Episodic for IRFs, Pass8 etc**
 - **Expecting large P8 sims to come**
 - **Run by Stephan Zimmer (Stockholm)**
 - **Upgraded Lyon to GridEngine batch system**
 - **Vincent Rolland at Montpellier to take over the simulations running**



- **Level 1 Processing**
 - **Steady at 10 CPU-yrs/month**
 - **90k CPU-hrs**





2012 Hardware Spending

- **Disk & tape for L1, MC and Pass7 reprocessing ✓**
 - **Disk pricing uncertain at present: assuming \$0.5k/TB**
 - **450 TB each disk and tape (\$0.12k/TB) for L1 & MC**
 - **Replace remaining 48 TB of borrowed storage**
 - **2 PB tape for Pass 8 reprocess – got 1 PB for P7 repro**
- **Start replacing aging servers**
 - **Up to 25 standalone servers: spec in progress**
 - **Replace 400 cores in batch queue**
 - **Buy 2 5 TB tape drives ✓**
 - **Replace 100 TB of >5 yr-old fileservers ✓**
 - **Additional user disk ✓**



2013 Hardware Projection

- **L1, MC, Pass8 full reprocessing**
 - 450 TB disk @ \$0.5k/TB
 - 1.5 PB tape for L1 & Pass 8 reprocess
 - Add 5 interactive servers (\$25k)
 - Total ~\$310k

- **Start replacing aging servers**
 - 400 cores in batch queues (~\$175k)
 - 100 TB of >5 yr-old file servers: ~\$50k
 - Oracle servers - ~\$80k

- **Total \$615k**



The Way Forward on Storage

- We've bought our last storage from Oracle
- SLAC SCCS now has recommendations for vendors:
 - Dell for Workgroup size
 - NetApps (bought from LSI) for mid-range/xrootd (us) ✓
 - Data Direct Networks for large (>PB)
- Of course, it was not dull
 - Floods in Thailand delayed our order
 - Got 450 TB from Dell for \$200k – new servers behaving very well!
 - Need next shot of disk in the fall – start order around Sept.



Summary

- **Disk issues are hopefully behind us**
- **Need \$615k for CY13 hardware**
 - **Pass8**
 - **Replacing old hardware, including Oracle servers**
- **Stalled on new initiatives due to P7 reprocessing, OS upgrades:**
 - **Data reprocessing at Lyon**
 - **Extend the pipeline to the GRID**
 - **Researching virtualization**