



CDF Computing Model & Status



Toronto



INFN Bologna



Glasgow



UC San Diego

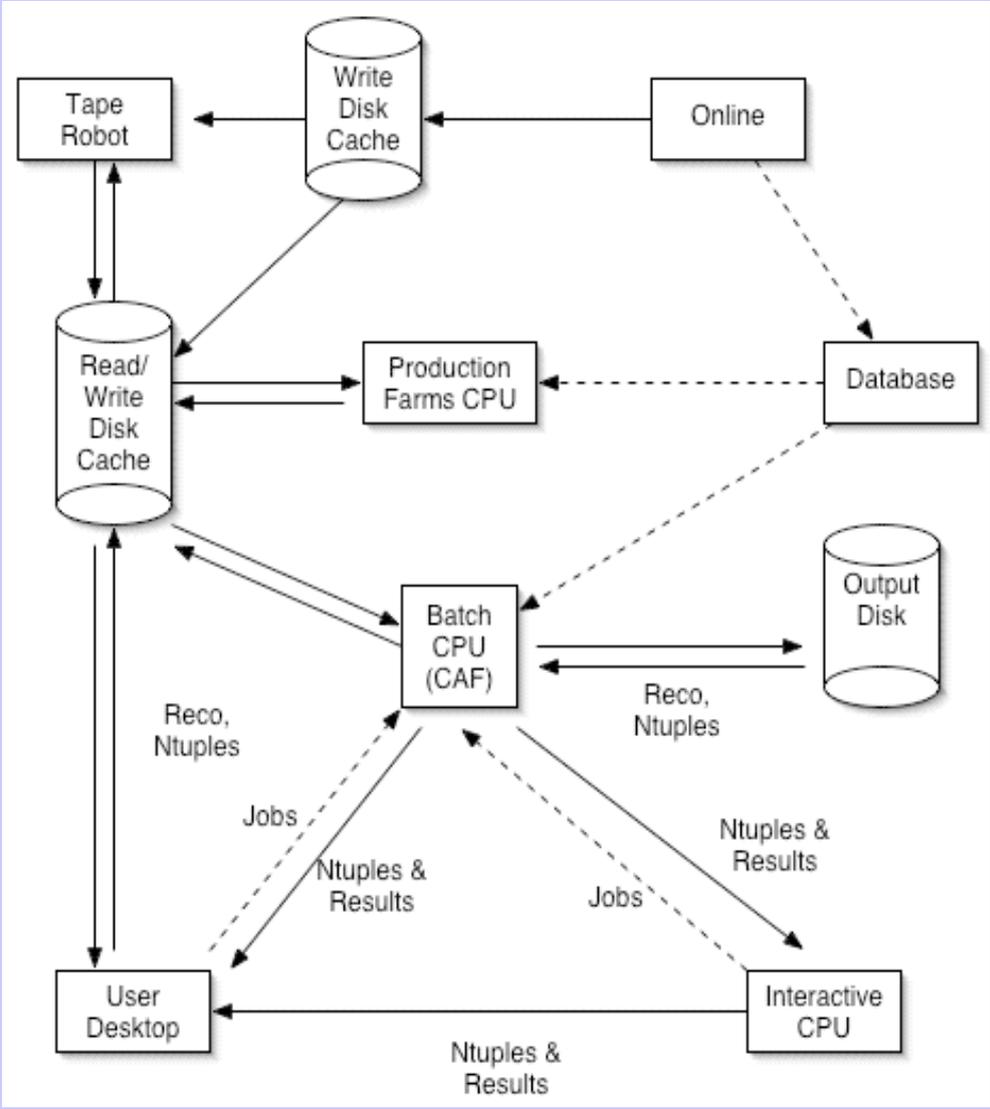


◆ Director's Review of
Run 2 Computing
13 September 2004



CDF Computing Model

- ◆ Offline model from data logging to primary analysis dataset creation has not changed.
- ◆ Official MC production continues off sight
- ◆ Shift more analysis to sights where data of interest is pinned



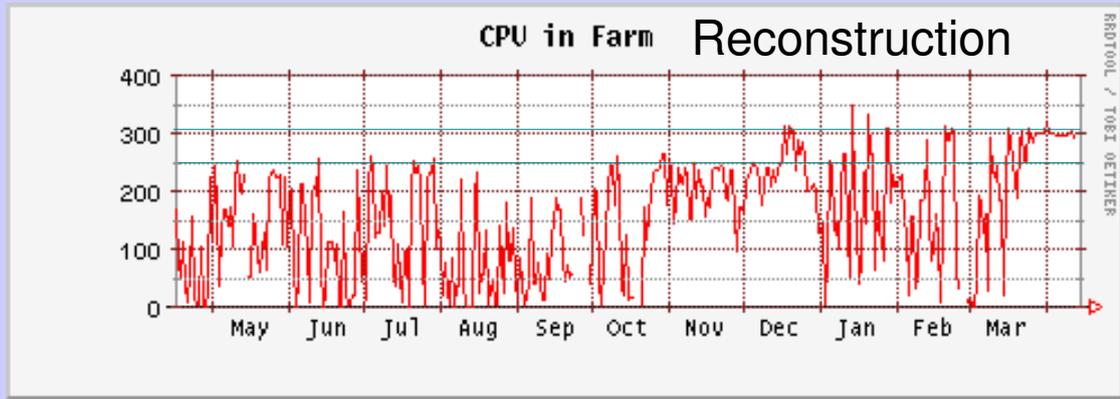


Status of Computing Model

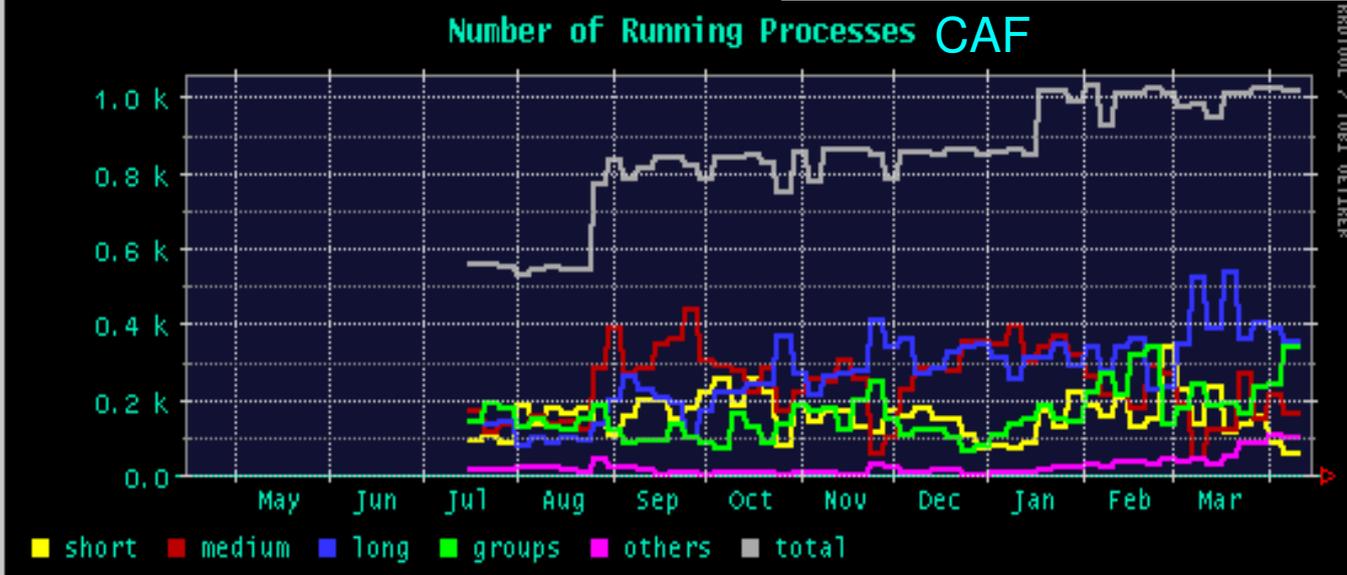
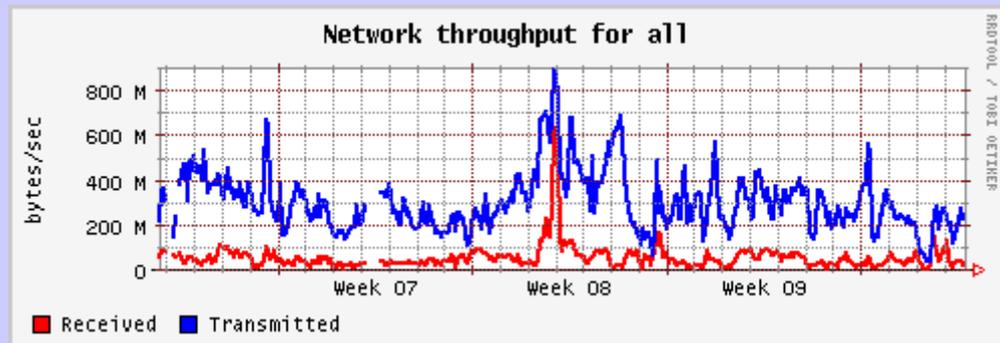
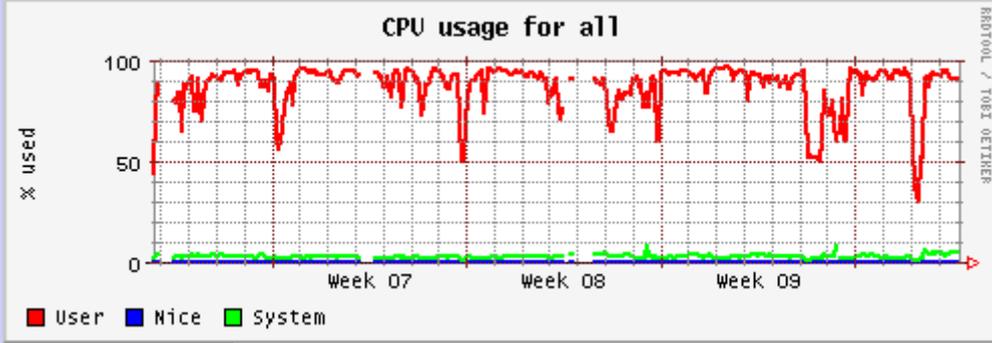
- ◆ The concern last year was “would this model scale to the level we needed it to”
- ◆ In FY04 we have scaled both the CAF and the Dcache systems sufficiently for the '04 budget.
- ◆ The limits of these systems were determined by power and cooling, NOT by software!
- ◆ In order to grow further we must replicate the system around the world
- ◆ This process is well underway
- ◆ (DCAF + SAM) -> migrate tools underneath in order to be able to utilize the GRID



Resource Utilization - Farms



~250 cpus last fall
 ~300 cpus in winter



3*384 nodes
 cpus=2*384
 (Condor CAF
 not shown)



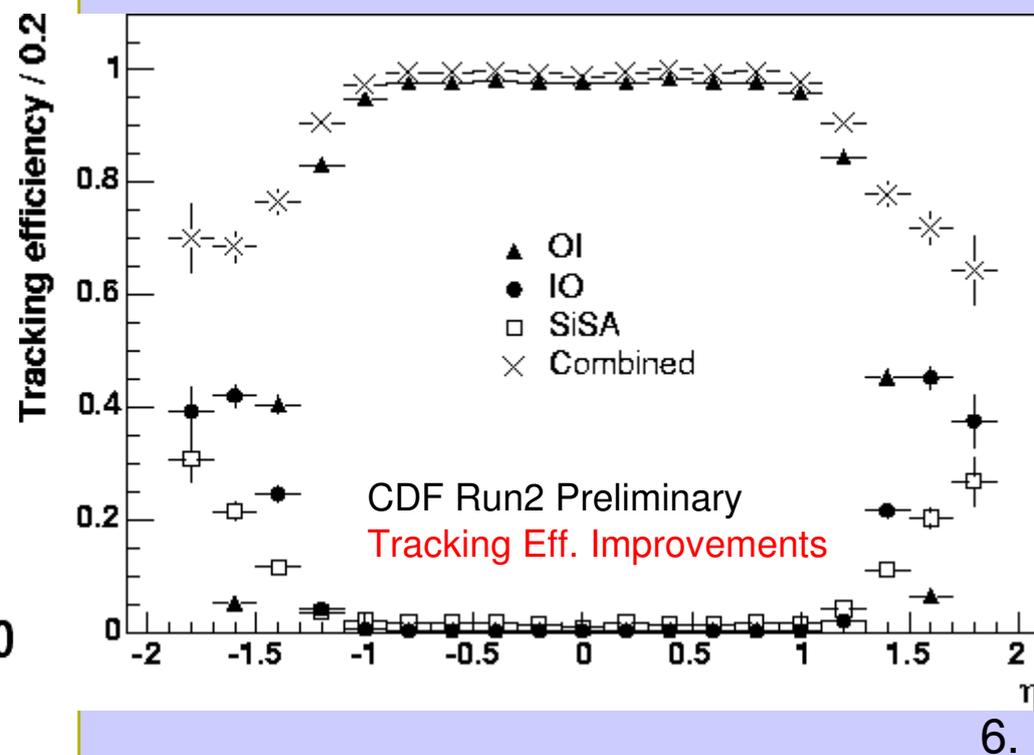
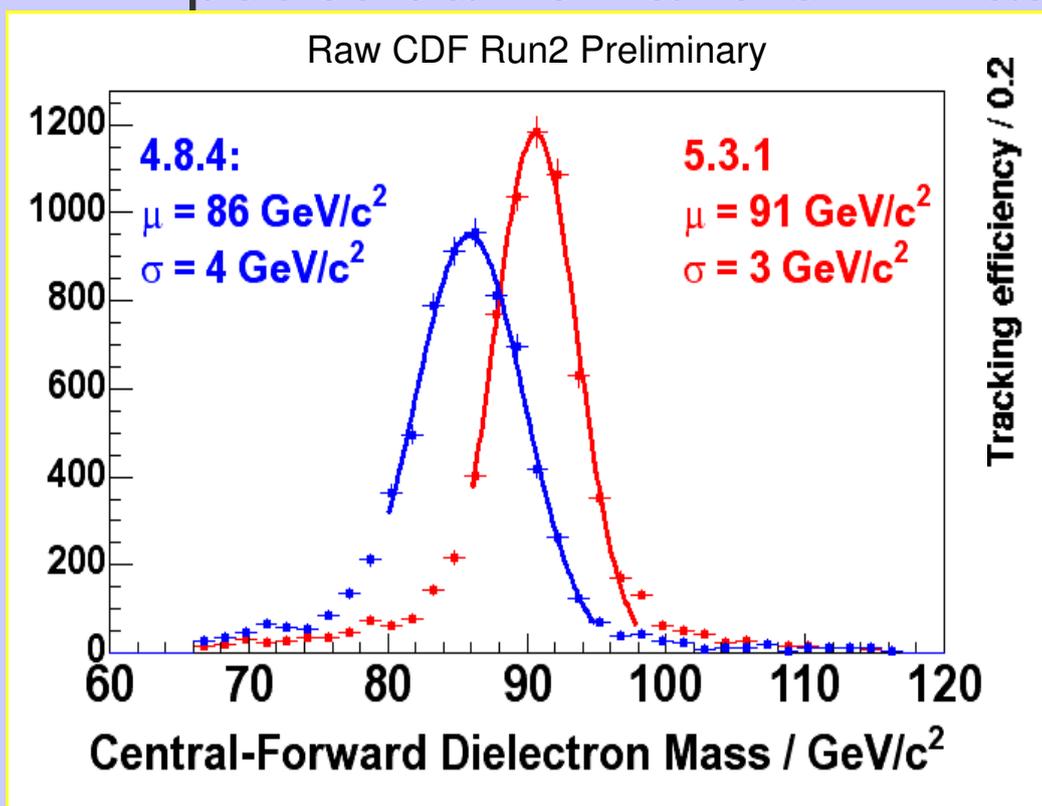
Status of MOU commitments

- ◆ CDF has started a process of gathering MOU level commitments for offsite computing
 - ◆ Canadians
 - ◆ UCL
 - ◆ Taiwan
 - ◆ Korea
- ◆ The remaining agreements should be completed by the end of this year



Reconstruction Status

- ◆ Reconstruction passes(all data, 3 times):
 - ◆ 4.8.4 ran non-optimized, no forward tracking or IMU
 - ◆ 5.1.0 optimized, alignment improved, beamline used
 - ◆ 5.3.0 uses final CAL calib., high forward tracking eff.
 - ◆ Output of production is immediately useful, 42 output streams have eliminated secondary datasets





Major upgrade of Simulation

- ◆ Detector geometry description improvements
 - ◆ Added detectors
 - ◆ Tuned passive material with photon conversions
- ◆ Parameterized Si charge deposition models
- ◆ COT drift model improved
- ◆ Calorimeter response tune – the results jet energy scale task force
- ◆ Much wider use of “realistic” simulation
 - ◆ Inactive regions or channels are ignored
 - ◆ Misalignments are applied
 - ◆ Fully digital trigger is simulated
 - ◆ Big improvement over run1 but cost resources

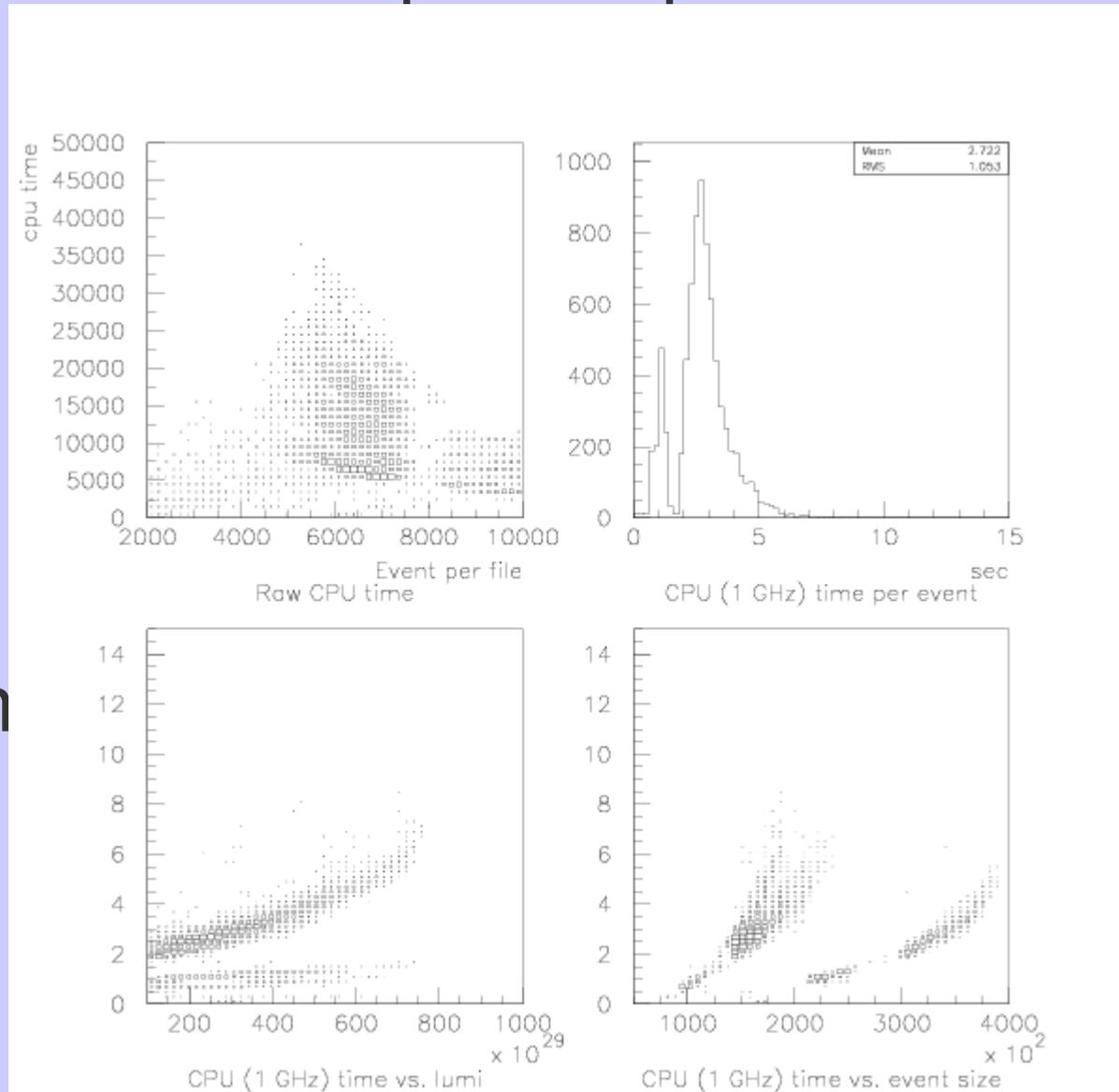


Status of Kai Migration

- ◆ We've moved all development to g++. Support for KAI is gone. It will probably not work with future versions of Linux.
- ◆ The next frozen physics release will use g++, target Winter 2004-2005
- ◆ We can build the release with 3.3.1
- ◆ We're still in the process of validating
 - ◆ Debug build reproduces Kai results
 - ◆ Optimized version still has problems – we need to find the set of optimizations that produce correct results
- ◆ For performance reasons we may want to investigate the Intel compiler next

CPU vs. Luminosity

- ◆ Behavior is dependent on trigger
- ◆ Bulk of the data does not pose a problem



- ◆ B=high PT lepton



Monitoring the CAFs

- ◆ CDF has formed a computing resource/usage task force
- ◆ Preliminary results show:
 - ◆ Bulk of cpu is used by the B group. It requires the full power of the framework. They work directly from the primary datasets.
 - ◆ All other groups do analysis from 30Gbyte ntuples with varying levels of standardization
 - ◆ ~30% of CAF is used for MC
 - ◆ 83% of jobs use <1sec/event, 17% mean of 3sec.
 - ◆ There are 203 users of condor CAF in the past 2 months. None stick out...
- ◆ Offsite CAFs have lots of spare capacity

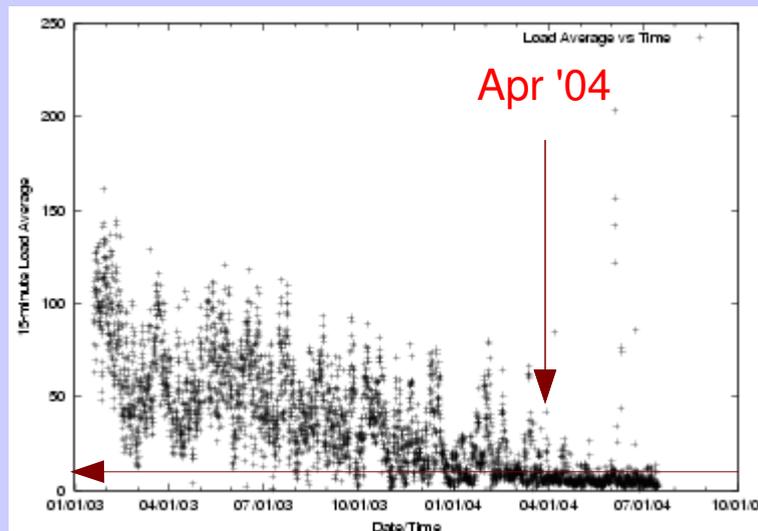


Increasing Analysis Efficiency

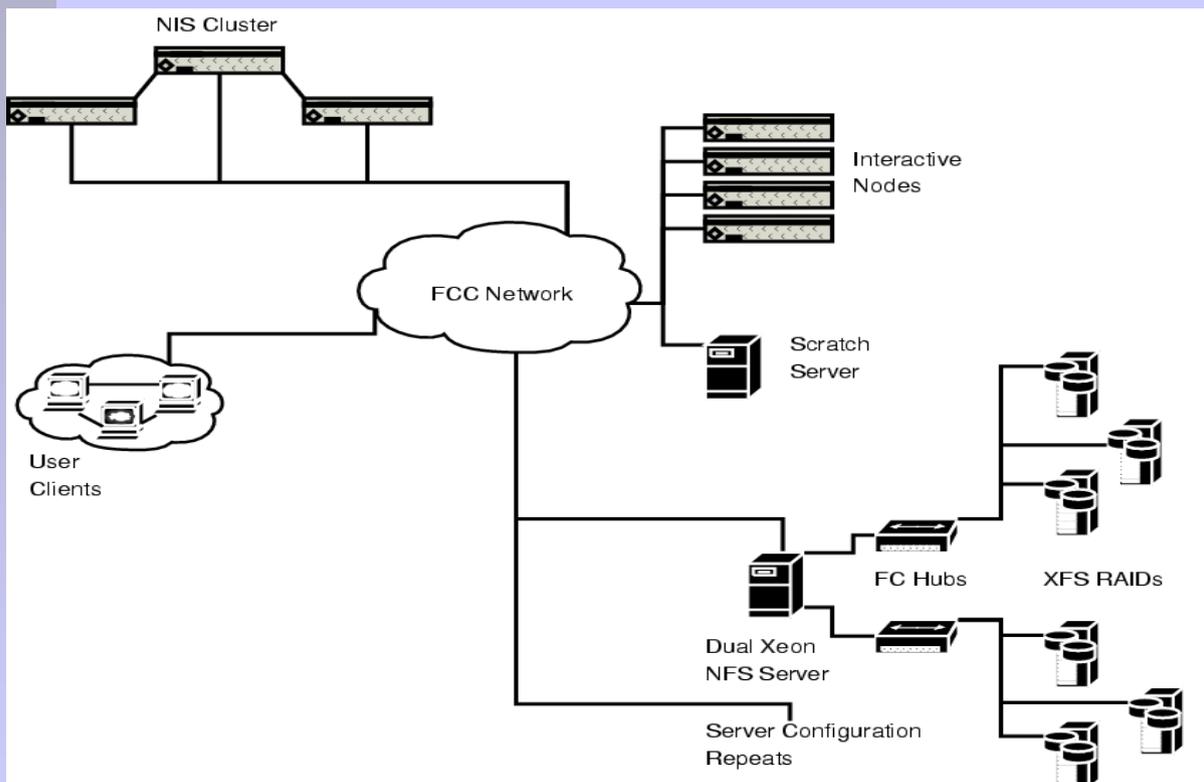
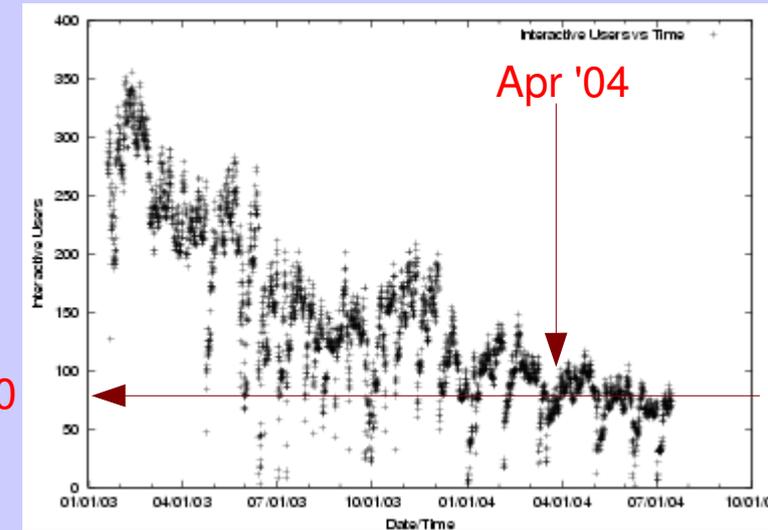
- ◆ Reduce mistakes/retry rate by making waste cost = “market economy”
- ◆ Move stabilized algorithms to Production
 - ◆ Cosmic filter
 - ◆ Beam constrained tracks
- ◆ Speed up CTVMFT (used by B group)
- ◆ Make official ntuples earlier in the processing chain. Continue to encourage standardization
- ◆ Move more of MC generation out of users hands into official dataset creation.
- ◆ Improve monitoring so we can learn even more.



Decommissioning SGI



No. of users = 70
Load Avg. = 10



- ◆ Fcdfsgi2 can be decommissioned
- ◆ Still need a login pool and disk server
- ◆ ->Linux based solution



What we plan to do

- ◆ Improve data format further
- ◆ Reduce the number of copies of data
- ◆ Continue to improve tracking
- ◆ Complete migration away from KAI compiler
- ◆ Prepare code base for required GRID infrastructure without disrupting physics
- ◆ Continue to support core software packages
- ◆ Improve support for analysis packages eg. Stntuple, Btag*. They should be validated for frozen releases as they mature.