# Run 2004, time-line (scenario) & other issues

A summary of challenges, opened issues and future on a *stuffed-on-a-Saturday* Computing session

With all other meetings
Thanks for attending ...

# Calibration & Sub-system readiness

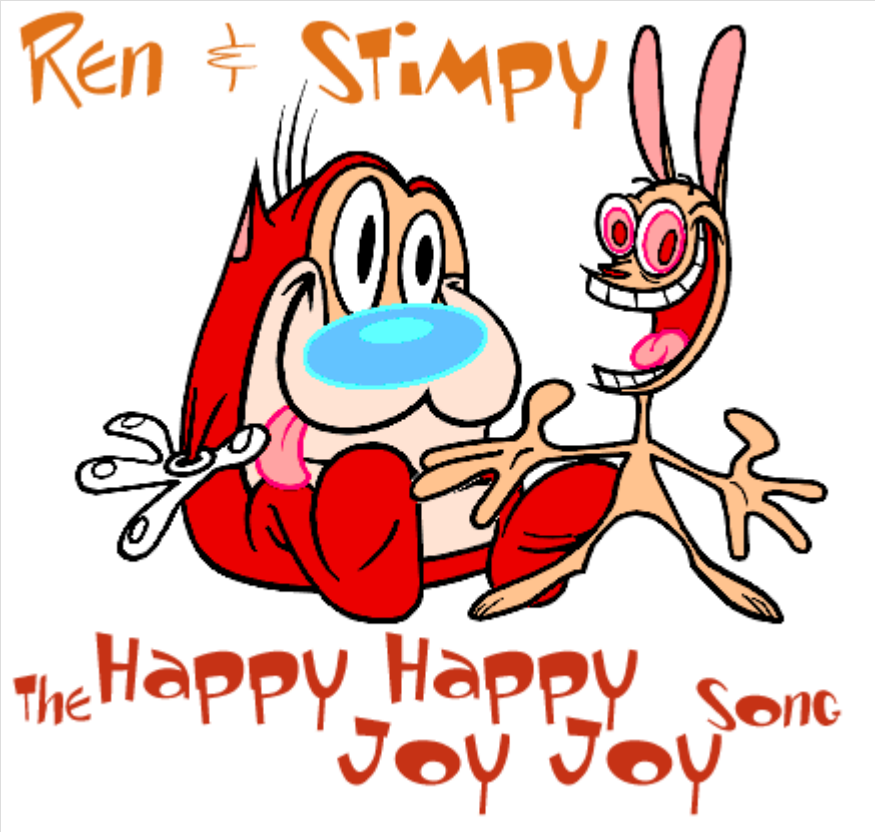
- Initial target for production Mid-July (that's now)
- Caveats: What was agreed upon
  - We MUST do production using ITTF
  - We WILL start with all of the express stream
  - Will produce a week worth of data for last checks

  - We will not start without the SVT
  - SVT review consolidated this
    - SVT must be successful in the 2004 run
    - 80 um resolution advertised (heard 50/60 um)

**But first, how does calibration looks like ??**

# Calibration & Sub-system readiness

- First things first




**Un-precedented distortions were taken care off**, new methods for *SpaceCharge* in place, twist, clock etc ... done, dE/dx is in quite decent shape (TBC)

**Gene V. Buren !!!**

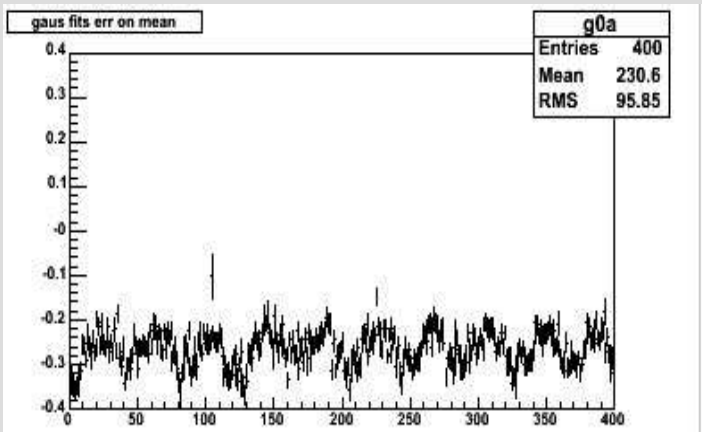
and all who have helped
( H. Long, P. Sorensen, J. Thomas,
H. Ward, H. Wienman,
W.M Zhang, ...)

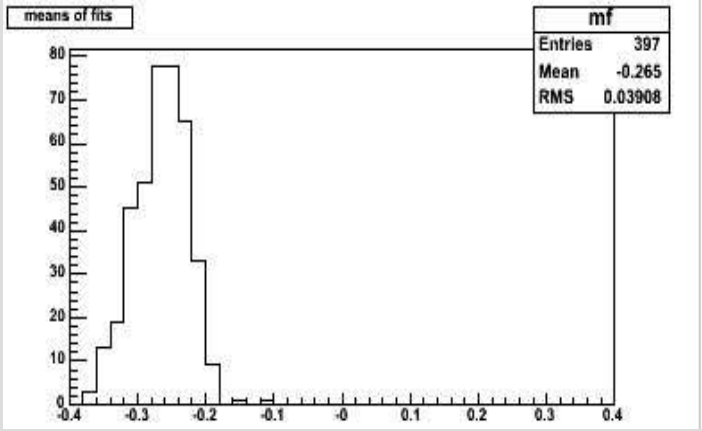
Note: List do not include software sub-system coordinators

# In case you did not follow the story, 2 quick slides ...

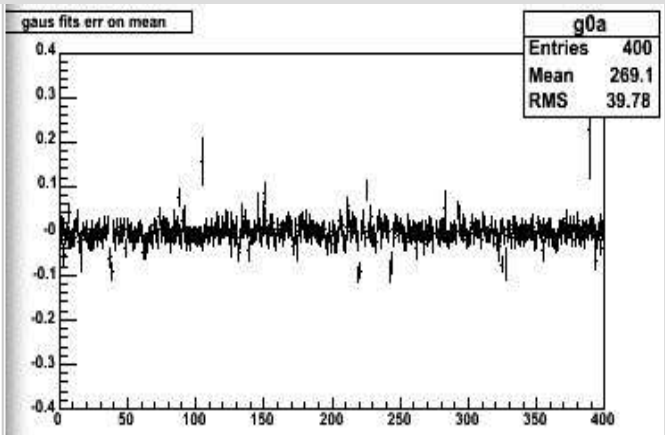
- SpaceCharge

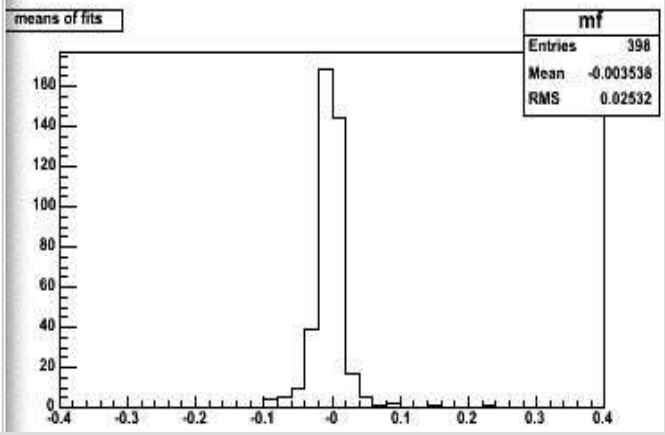
**BEFORE**




**AFTER**



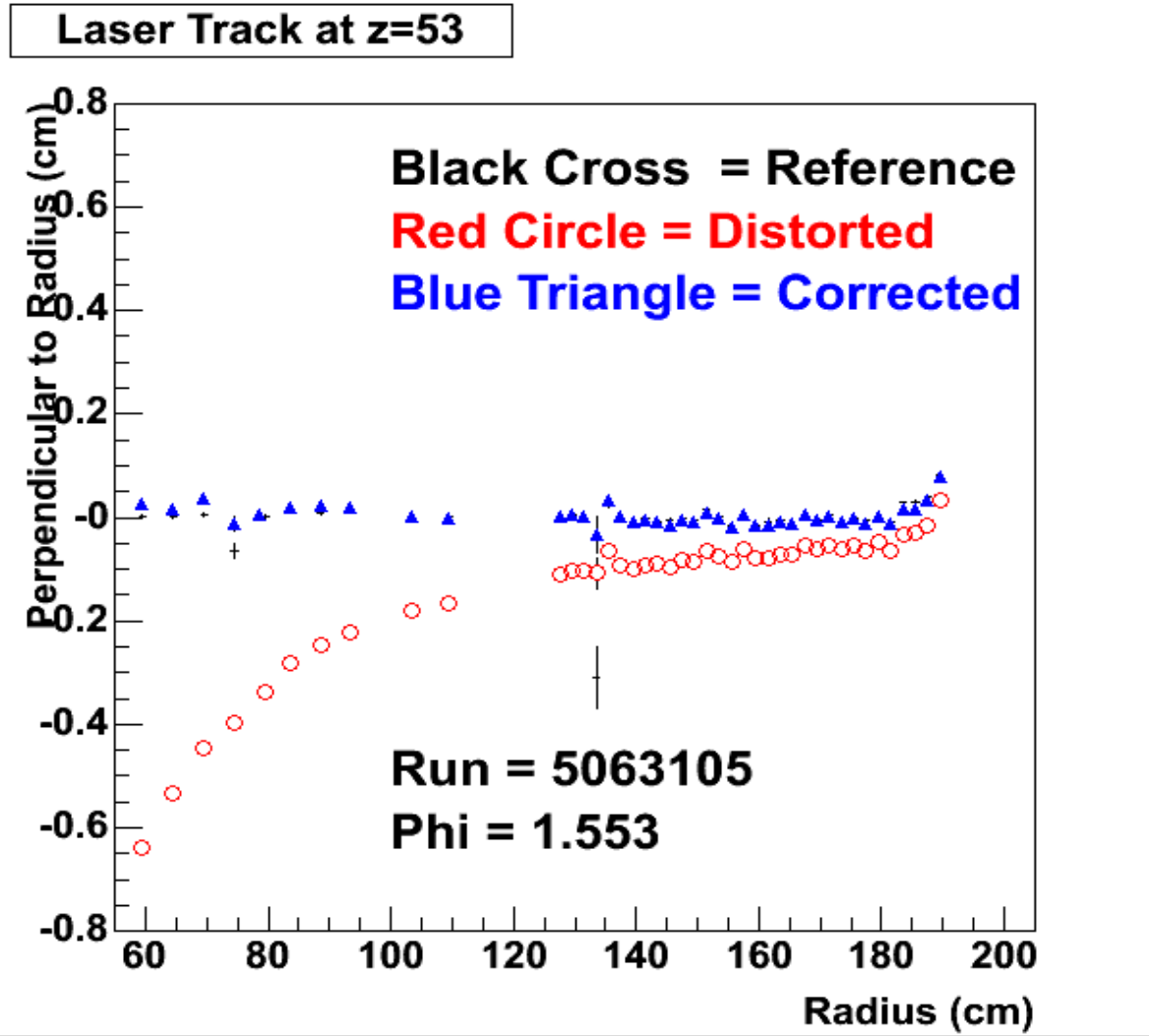

<DCA> versus event #

Structure indicate time scale of the order of seconds (scaler <> over 60 sec)

=> Event-by-Event correction

# one more on calibration ...

- Ring Short




Distortion of the order of 0.5 cm on East

Study West side with extra resistor, apply study to East.

# Overall calibration readiness

- A few example would not fair to the amount of work, for more info, see
  http://hepwww.physics.yale.edu/star/upgrades/workshop04/jun16-1/vanburen.pdf

- Confident most is done for Au+Au
  - More improvement can be done (inner outer sector alignment for example, field distortions ...)
  - **Au+Au can start any time** for a “as good as in the past years”
  - Au+Au would benefit from the pending calibrations

- p+p
  - Working on beamLine constraint
  - SpaceCharge effects not yet checked
  - Would need **+1 week before p+p can start**

# ITTF readiness

- **ITTF** *M. Calderon for Z. Chajecki*
  - Past evaluation on simulated data showed similar results
  - d+Au showed similar results
    - Few issues fixed ...
  - Oops !! Problem with CTB matching
    - Checked code - Algorithm different
    - Discussed issue with Mike/Manuel/Jan
    - Propose to
      - Short term: port ppLMV to `StGenericVertexMaker` and finish evaluation (Jan volunteered to help)
      - In //, develop and study `StMinuitVertexFinder` (enhanced CTB matching, may try EMC ...)
  - Need +1-2 weeks for complete evaluation, more work for VertexFinder for p+p

# Sub-system readiness

Heard from sub-systems earlier ...

| | |
|---|---|
| ✔ TPC | Au+Au ready, **p+p +1 week** |
| ✔ E-EMC | Ready (?) |
| ✔ B-EMC | Ready any time |
| ✔ TOF | Ready & waiting for production |
| ✗ FTPC | Ready in a few days (Nch)<br>Will need more calibration work and later re-pass of limited data |
| ➢ PMD | Post-production processing needed |
| – SVT | + 1 weeks (really ?) |
| ✗ ITTF | + 1 week Au+Au, more for p+p unless we want it “as good” or “as bad” as last year |

**What is the time scale for those productions ...**

# How long the processing will take ??

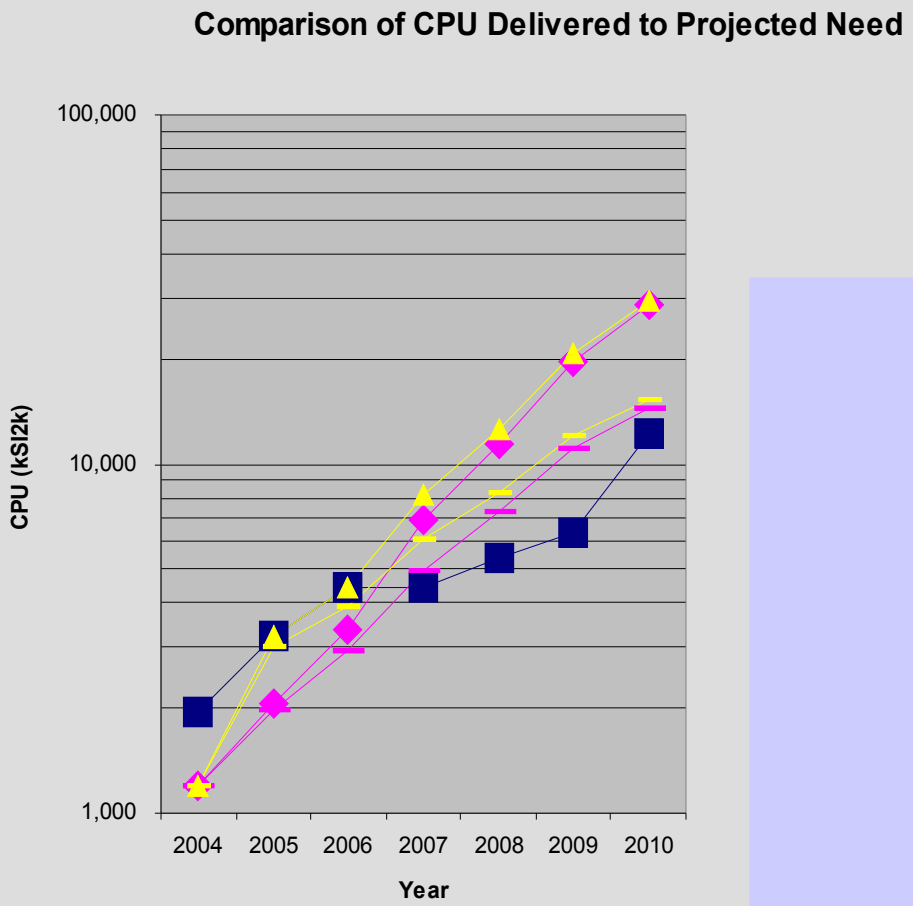
## Tabulating by `triggerSetupName` (averaged), using the dE/dx pass & adjusting for ITTF pass

| Trigger | N events | MB/evts | sec/event | ITTF factor | ITTF adjust | Total days | Total month | FF (months*df) |
|---|---|---|---|---|---|---|---|---|
| ***ppMinBias*** | *2533111* | | | *8.00%* | *0.00* | *0.00* | *0.00* | ***0.00*** |
| ***productionPP*** | *13030789* | | | *8.00%* | *0.00* | *0.00* | *0.00* | ***0.00*** |
| **ProductionCentral** | 734727 | | | *8.00%* | 0.00 | 0.00 | 0.00 | **0.00** |
| **productionMinBiasHT** | 19882 | | | *8.00%* | 0.00 | 0.00 | 0.00 | **0.00** |
| **ProductionHalfLow** | 7677264 | 2.60 | 81.67 | *8.00%* | 81.60 | 7251.16 | 241.71 | **0.92** |
| **ProductionMinBias** | 30950437 | 2.03 | 33.10 | *8.00%* | 33.07 | 11847.68 | 394.92 | **1.50** |
| **ProductionHalfHigh** | 854044 | 5.84 | 71.38 | *8.00%* | 71.32 | 705.01 | 23.50 | **0.09** |
| **ProductionHigh** | 9693192 | 5.07 | 71.53 | *8.00%* | 71.47 | 8018.51 | 267.28 | **1.01** |
| **ProductionLow** | 30902743 | 4.54 | 114.28 | *8.00%* | 114.19 | 40841.90 | 1361.40 | **5.17** |
| **ProductionMid** | 12931511 | 5.17 | 65.77 | *8.00%* | 65.72 | 9835.94 | 327.86 | **1.24** |
| Total num events | 93763800 | | | Total days / months 1 CPU | | 78500.21 | 2616.67 | |
| GB total | 415976.14 | | | Total days / months (farm) | | 253.23 | 8.44 | |
| TB total | 406.23 | | | Total days / months (farm+df) | | 297.91 | 9.93 | **9.93** |
| MuDst | 40.62 | | | | | | | |

- Previous calculation showed p+p ~ 3 weeks (will know better later)
- Au+Au ~ 10 months
- ITTF gain has large uncertainties (0.5% to 21% in d+Au)

Concern remains the same: it is long for 1 pass ...

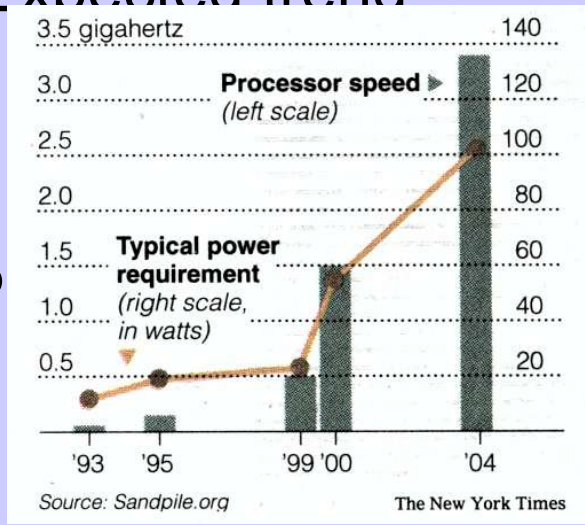
# Any hopes for the coming years ?




- **Blue** = projected needs
- **Magenta** = supplied with current funding
- **Yellow** = supplement

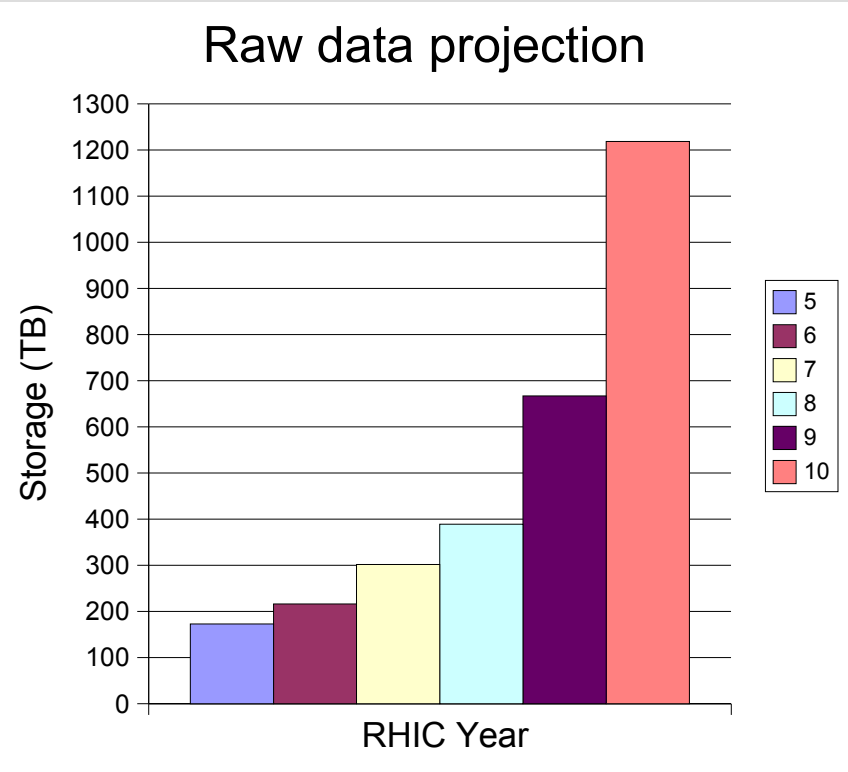
Upper curve = Moore's law
Lower curve = Expected trend

Supplement of 1.6 M$ for 2005 requested



# Rapid myth-busters
# Short fall forever is not 100% true

- Data amount based on DAQ100, and a 15%, 25%, 40% of DAQ1000 starting from 2008
- **Within** those numbers
  - We would **a priori NOT** have a CPU resource **problem beyond 2008**
  - BUT, DAQ1000 (or 5000) should NEVER imply an event rate > 400 Hz (to tape/disk)
  - At least, not BEFORE 2010




➔ anything else is outside current funding (**hard limits set** or +X-tra)

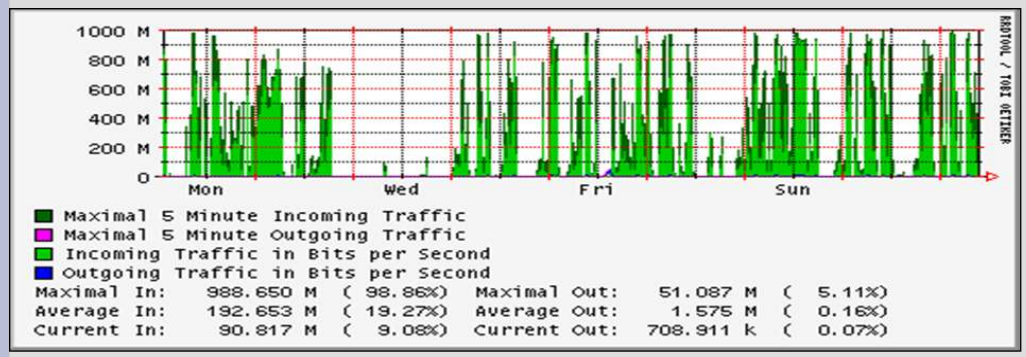
➔ On this positive news, DO NOT feel like going wild ...

➔ Ex: **600 Hz in 2008 not possible**

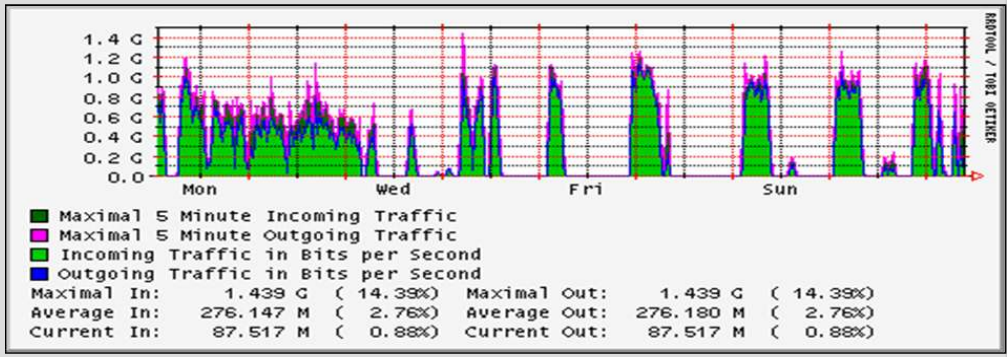
# Myth buster #2

- RCF Requirements scale with our needs (re-assessed every year for HPSS, Far, Storage) within funding
  - Nothing happens by magic
  - Most of the cost goes to tape storage and robotics in current plan

- **Myth #2**: Stop believing (or saying) that HPSS is limiting
  (a) we have not filled the pipe, will scale nonetheless
  (b) Phenix does better now




STAR = 100 Mb/sec



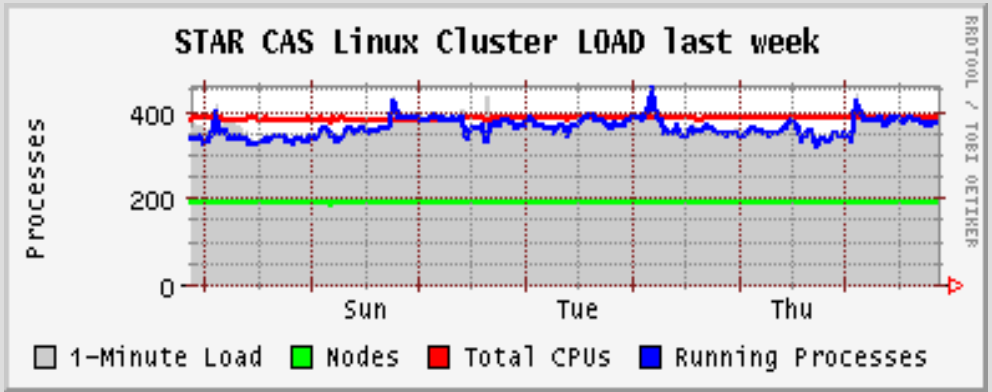

Phenix = 120 Mb/sec, 90 sustained

# Back on track - Analysis side ... Our current env.

- 2 (3) step detector mode
  - Fast detector with endless calibration
  - Detector with ongoing calibration
  - Tracking detectors
- MuDST
  - Would rather see people helping than inventing their own scheme – Sum of efforts exceeds time spent on core development
  - Strong interest in keeping a limited number of IO format
    - Allows such development to be useful for ALL
    - Did meet with Jan / Alex (+ talked to Akio) for fast detector in “MuDST”
  - Not clear yet what to do ... Consistent IO interface. StIOMaker ?

# Back on track - Analysis side ... Resources

- Another story (that one a painful every day reality)
  - Active users doing analysis: yes, you have to wait (resources are ~ maximized)
  - Up to 2008, better plan for external resources
    Seriously interested in MRI ? ITR ?
    **Don't hesitate to contact me !!**
  - 2009+: border between production and analysis will be long time gone ...



# In the interim ... The 'G' word !!

- Many (I for sure) believe Grid-computing should soon provide a breather
  - Helps recovering distributed unused resources.
- Much to be done (consolidation of our code and framework)
- Several initiatives ongoing & milestones
  - Maintenance of effort via new hire: Levente Hajdu
    - A new face (and much cleaner) for the Scheduler (SUMS)
    - Allows evolution with resource discovery and advanced algorithm – Some work with S.B. Prof. on DLT
    - More help from ITD (1.5 FTE + resources)
  - STAR/ITD officially accepted in iVDGL
  - Consolidation via proposals
    - **Particle Physics Data Grid** (PPDG) - funding accepted by SciDAC (*Sci*entific *D*iscovery through *A*dvanced *C*omputing) -
    - **SBIR Phase I**: with Tech-X corporation
    - **SBIR Phase II**: with Stottler Henke
  - Many help from CS (**SDM**, Condor, Globus, etc ...)
  - Looking toward the future: *OpenScience-Grid* (OSG)

# A 'G' tool, advantages / IO format and beyond

- GridCollector *Wei-Ming and/or John Wu*
  - Allows for selecting ONLY the events you need
  - Speed up analysis proportionally to selection
  - You DO NOT need to know where the files are
    - They are even brought to you from HPSS if needed
  - Project need testing
  - Again, votes for StIOMaker based interface ...

# Speaking of MuDST (or whatever it will be named) ...

- Sent many Emails to convener list for MuDST support
  - Number of responses = NULL
  - Shall we assume all is fine ?? Obviously not ...

- Reminder (`% sed "s/STAR/BaBar/"` if not)

  With STAR now solidly in its data-taking phase, **it is essential** that the collaboration members **contribute in an equitable manner** to the operation of the experiment. **The privilege of analyzing data** and producing interesting results **carries with it the responsibility of shouldering a fair portion of the STAR community work load** [...]. Without this continued support of the operation of STAR (in every respect) from the collaboration, STAR will not thrive or even survive to take the quality data and produce high quality physics that has always been our objective.

Thanks for the help on ITTF testing.

**HOWEVER, STILL waiting for the MuDST / common IO format support**

# S&C future (another challenge)

- R&D, detector development along with experiment 10 year plan and increase luminosity
  - All section of S&C sub-groups requested to plan for the future
  - Verbal project basic requirements requests will formalize into project with milestones or requirement (reviewed) document
    - Aim: long term support for increase event rate, dynamic change in detector configuration, re-usable and long term manpower investment in R&D

# Future - Challenge

- Asked db, simulation, reconstruction and production
  - Simulation on a good trail with VMC — *Maxim Potekhin*
  - Db scalability evaluation on its way — *Michael DePhillips*
  - Production thoughts (Lidia Didenko) discussed. Will need to be formalized. Need more automation — Crystal Nassouri

- Calibration future worked out (will become clearer as methods are evaluated). TPC future presented at Yale. Would need a complete view of all sub-systems (soon)
- Reconstruction: need to evaluate ITTF and Forward Tracking (2 tasks – TPC short track+SMD and FTPC)

- Some work which seems unrelated are actually very related
  - Qt development
  - Open-Inventor, geometry browser

  Some activities require extraneous meetings a week ...

# As a summary ...

- Production readiness
  - Will need a minimum of +1 week for Au+Au, more for p+p (?)
  - Need immediate extraneous assistance to assist expert (Jan) with Vertex evaluation in p+p
  - **Pre-pass Au-Au August 2nd – p+p 9th – Start all 23rd**
- Analysis challenges
  - Need consistency in IO model. We cannot improve not do consistent Physics  if things goes in all directions.
  - Would like to have volunteers for testing GridCollector
- Medium / Long term issues
  - Serious work being done in long term issues such as geometry, simulation, database, calibration, etc ...
  - Those projects may also need help

...

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