

PHENIX DAQ Status

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Problems and Solutions This Month

- <http://www.phenix.bnl.gov:8080/daq>
- Objectivity problems down to an every-few-days call to Martin
- MUTR.S Stations 2/3 Octants 5/6 have had chronic problems with the Glink-Clink Crate voltage (more IR drop to those crates?)
- Ports on Gigabit switch sometimes "fall off," until switch is power cycled (the Gigabit switch is used only as the atp/phnxbox network at the moment)
- Flow control in EvB can lead to misdiagnosis of some problems (when the logbook says, "run ended with granule XX.NSEW busy," that is almost always an EvB problem)
- Obscure ARCNET server bug materialized (if you try to transmit enough corrupted hex files, the server eventually stops being able to read any hex files at all)
- Data logger found not writing data to disk despite appearances (network activity normal, monitoring ok)
- Zero suppression of FCAL led to confusion since sorted out
- We were blowing FCAL HV fuses when the background was high
- Adler left.

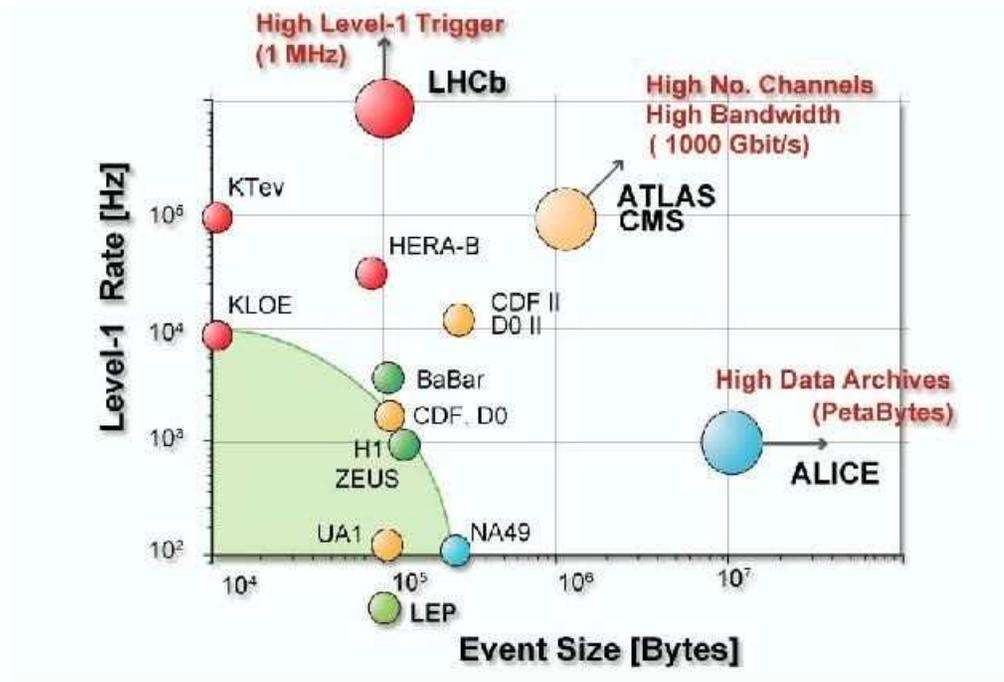
New Stuff for pp

- Ed Desmond put in place more recording of RHIC parameters (via the CDEV conduit to C-A)
- Sergei, John Lajoie, Martin, and Ed put in place handling of GL1P scalers
- STAR scalers fell off my list of things to do... next year I guess

Present Performance

- Level 2 running online; Tony has reported nice results on the electron trigger
 - Running with no rejection
 - Does not seem to substantially impact running (though the evidence is mixed on whether there is a 10-20% reduction in speed, and it's possible that it crashes an atp periodically)
- Logging performance is sometimes as high as 120 Mbyte/sec to two buffer boxes, same as with et logger. The bottleneck is probably the way the data are transferred from the atp's to the phnxbox's (Adler's last network measurements tell us that a single Gigabit link can go up to 120 Mbyte/sec)
- I have seen data through the EvB (no logging) as high as 150 Mbyte/sec, around 1600 events/sec, but not higher; the practical limit with fluctuations and logging is around 120 Mbyte/sec, but unless things are tuned up (zero suppression just right, flow adjusted), it's more like 100 Mbyte/sec
- Test with BB system to SEB appeared to show no fundamental bottleneck up to 5.3 kHz; an all-system test would give us some useful information
- Multi-event buffering not in use; all systems except PC now appear to be ready for a more stringent test. Latest PC firmware has been stuck in my INBOX, but Glenn has run it at Oak Ridge and it looks close to him.

PHENIX Location in DAQ Pantheon (from CMS at CHEP)



PHENIX
 10^5 bytes
 10^3 Hz

Post-Run Development Plans

Post run development plans are unclear because of absence by many DAQ people in the week following the end of the run... plans are up in the air. Since the WC and CM detectors will be operational over the summer, we need only focus on projects that require the whole detector or the EC. The topics that need to be addressed are:

- Event Builder work: I don't know if Brian is coming or if Columbia has hired new postdocs to work on this. The topics to be addressed are integration of the Gigabit switch, SEB performance, improvement of TCP transfer to phnxbox's, seb/atp/ebc software, and upgrade of WNT4 machines to W2k. I'm not convinced that any of these really require the whole detector intact to work on.
- A throughput test with only SEB test software would tell us whether to expect problems down the road with the whole detector.
- Multievent buffering: run whole detector with or without PC, possibly with beam before end of run. The only reason to work on this right after the run is that there were some peculiarities in running the new firmware on the PC.E, which won't be available after the beginning of June.
- New EMCAL data format: again, only problems that need the EC operational are really necessary to work on right after the run.
- Do any systems need cosmic rays for alignment?

Conclusions

- The pp run DAQ conditions are basically the same as in d-Au, slightly faster than Run 2 (though more of the detector is operational)
- It's a big, complicated system with lots of failure modes, and almost half of the original DAQ group has moved on, either permanently or temporarily, but we have been able to keep the apparatus functioning reasonably well
- There are a few things that call for development right after the run with the detector intact but I'm not enough of an optimist to think we can complete the whole three-pronged approach to higher speed in that time... it's going to take sustained work over the summer