

DAQ Readiness for Run 5 pp

John Haggerty
Brookhaven National Laboratory

April 13, 2005



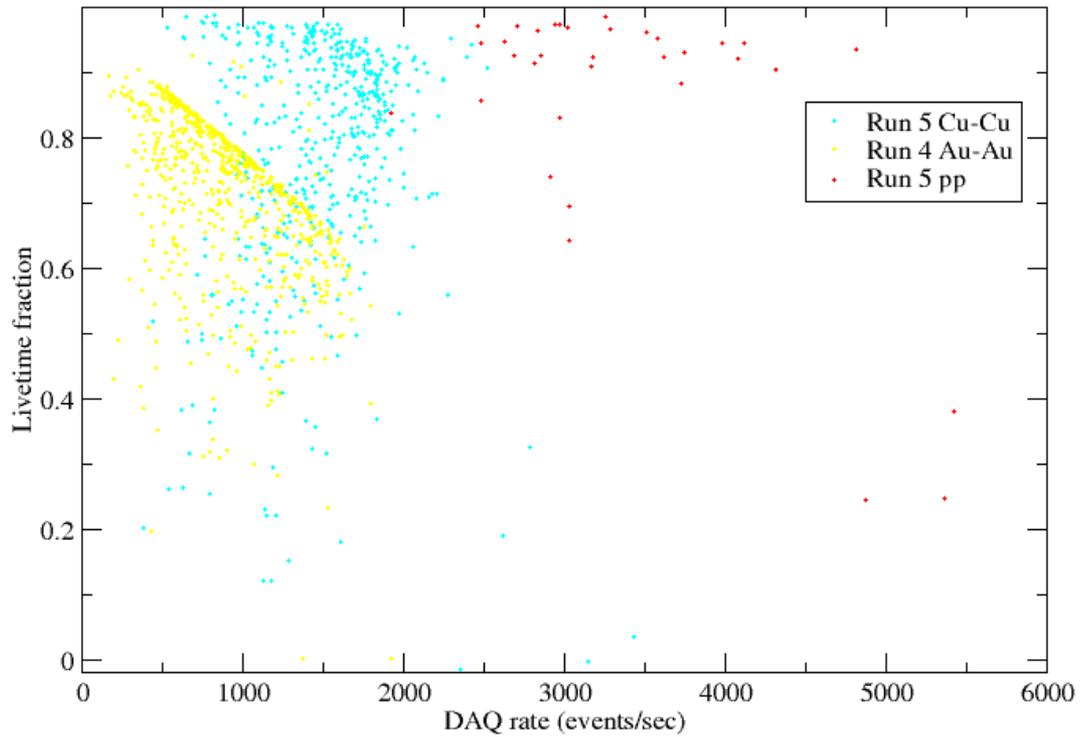
New for Run 5 pp

- For spin running, there is now the old list of new stuff that has been exercised in Cu-Cu:
 - Multievent buffering (4)
 - Additional buffer boxes
 - Linux Event Builder and fixed JSEB
 - MUID and ERT LL1's
 - PostgreSQL
- The main new things are:
 - Pushing the envelope on speed by finding and fixing bottlenecks in the Event Builder, DCM's, and wherever else we find them
 - New, faster online software in a version heavily revised by Sergey Belikov
 - More attention to scalars

Bottlenecks

- David Winter will discuss the great strides made in EvB performance, but the bottom line is... well, listen to his talk
- Jamie and I investigated bottlenecks up to the EvB, which is made very easy to do by David's "JSEB swap" function in the EvBExpertTool (although various standalone tricks can be used to study individual granules). The conclusions (so far):
 - The "split" BB (which is not zero suppressed) can run at 8.5 kHz
 - Some systems had some DCM channels with enough data to be a bottleneck to the whole system at 3-4 kHz. We dealt with:
 - EMCAL reference FEM's have empty ASIC card slots which were defeating the zero suppression; fixed by Chun/Jamie by new list memory and hit format
 - TEC had some large packets, which disappeared before we studied their effect further when Achim and Rob reduced the noise significantly
 - The DC had 3 packets with stuck bits; Vlad climbed up and replaced the FEM's, but only one of the three changed its behavior, although now the behavior has changed and the DC appears capable of running at 6 kHz now
 - We need some more time to study what happens at 6 kHz, and what's needed to go higher
 - Oops! We stopped dropping all empty packets sometime in Cu-Cu—use the Default button

Speed

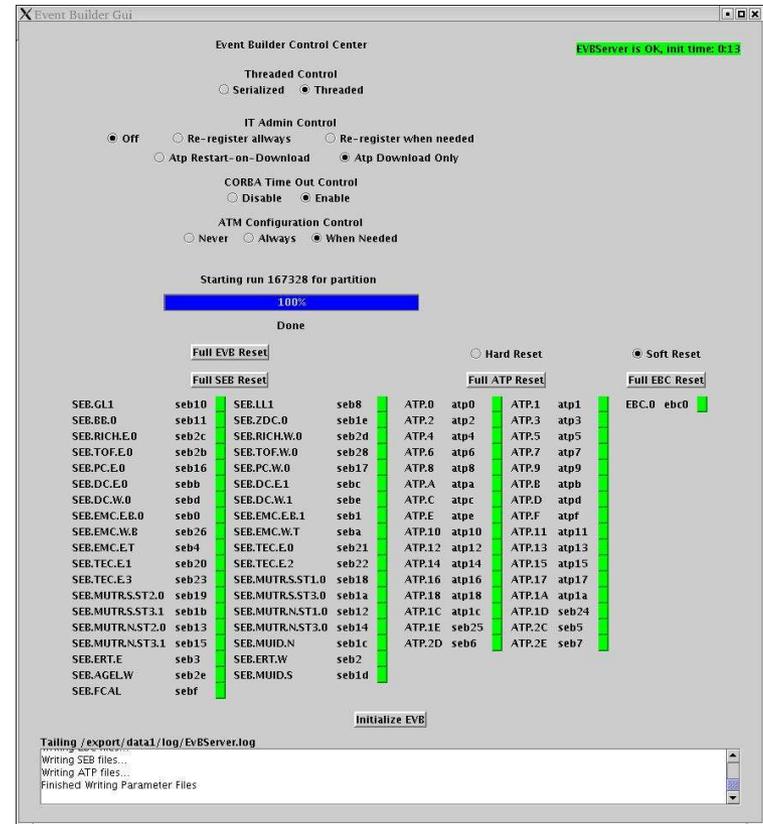


New Software

A major new release (R6.3.0) With many changes from Sergey Belikov, was brought into operation by Ed and Sergey with help from Chris and Martin

Looks pretty much the same on the outside, but the EvBServer initializes in under 15 seconds (nice progress bar, too)

Many other improvements as well



Scalers

- I still don't have a completely crisp view of exactly what is required in the analysis, but what we're doing is:
 - The "first" GL1p scaler read out on every event (4 scaler channels with the bunch number, cleared by non-calibration triggers)
 - The "second" GL1p scaler read out at begin and end run (possibly in scaler records every ten seconds) reading all 4x120 scalers, and cleared only at the beginning of the run
 - The GL1 DCM adds up the scalers from the "first" GL1p board and saves the result (right now to a file, could be to the database) when the GL1 run control is stopped
 - The STAR scalers are running autonomously, and when the controller detects the beginning of a run, accumulate during the run, and by a mechanism unknown to me write the results to a file at some point

Conclusion

- Things are back together for the pp run, although there have been enough changes that we may hit some new bumps in the road
- Detector systems are pretty much ready; raising the supply voltage on the MUTR.N has made it behave much better (at least with the beam off)
- I think we have all we need in terms of scalers and cdev data from RHIC...