

(PXD) DAQ Status

Björn Spruck



- (PXD) DAQ Problems since Cosmic Test
 - Solutions & Fixes
- Current Status
- TODO List

(I will not cover any DHH issues nor BonnDAQ)

- DHH limit (trigger deadtime) → mismatch/busy ...
- Not able to trigger in global DAQ
 - Wrong FTSW cabling ← that is actually **our** problem
- Wrong settings after switching between local/global (e.g. ext trigger setting, mask, ...) – trivial
 - Prevent wrong settings after power-up or fw change → check EPICS default values and (if applicable/necessary) add to configdb
- Still unsolved: we could not reproduce a problem with a broken header from ONSEN to EB. An additional check on ONSEN has been implemented. But the origin remains still unclear.

- ~~As far as I can tell, no direct problems in PXD integration anymore.~~
 - We only started taking “real” triggered data yesterday
 - PXD stops DAQ after ~4.3M events (we havens seen that with ONSEN only)
- Other possible problems ...
 - If nsm gets slow again, EB or HLT might read wrong configuration (pxd.used) → nothing we have influence on
 - Observed case that one HLT was sending outdated ROIs from previous run. → reason unclear, often Stop/Start was working, bu sometimes even Abort is not???
- Many problem were labels “PXD integration”, but actually were DAQ debugging
 - → Message to outside is “PXD problem”. I am not happy about this.

- Check the recorded data
- DHE-ID order needs to be increasing DHH data or ROI selection will not work
 - Re-cabling seems impossible, thus it has to be done in DHH firmware
- Switch to 16 outputs on ONSSEN & EB
 - Switch to round-robin on DHH, ONSSEN, EB?
 - Any of this changes (currently) requires recompile of EB binaries, thus switching back and forth for testing should be avoided.
- Default values after cold start (e.g. powerloss) → “slow control” issue
- Make sure that HLT/EB problems are not attributed to PXD
 - → finally, they would call the wrong expert in the night

- From PXD side? Not much!
 - Changes were more on the DAQ and Belle2 SlowControl side.
 - Limited influence, always had to wait for DAQ group to fix problems which were out of our responsibility
- Problems (on DAQ side with influence on PXD):
 - Interference B4 setup ↔ global DAQ
 - Run Control, HLT-Roisender, ...
 - Nsm required complete separation
 - A **lot** of config files had to be changed (nsm ports, ...)
 - Special EPICS setting for SVD
 - Different ports, environment leakage to other epics demons (operator error, typo in script, ...)
 - Scripts/configs not in repo (two stage repo!)
 - Update removed/overwrote, changes were lost
 - SCL update broke compatibility; RC/PS daemon change required (w/o notice)

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- Problems (on DAQ side with influence on PXD):
 - A **lot** of config files had to be changed back (nsm ports, ...)
 - Special EPICS setting for SVD reverted
 - Different ports, environment leakage to other epics demons (operator error, typo in script, ...). Script in repo but the fixed script on rc01 was overwritten by older version.
 - Scripts/configs not in repo (two stage repo!)
 - Update removed/overwrote, changes were lost
 - Pxdrc/pxdps started several times (operator error, should be fixed by idiot-prove restart script)
 - “roisender” and nsm daemon of roisender problems found and fixed(?)

- Different settings on different HLTs/EBs (software version)
 - Not all could be used with pxd
- Nsm slowness → HLT/EB got wrong setting (PXD incl/excl)
 - Explains some of the problems we have seen

- Known since phase 2 (and before), the nsm status for roisender process was not accurate. It showed running even if the process had crashed. Bad because PXD noticed the connection loss from HLT → PXD Error
 - Not fixed until Dec. Responsibilities? (ROIs – Tracking, scripts on HLT – DAQ, HLT, Tracking? ONSEN?, roisender – DAQ?, nsm daemon – DAQ?)
 - Finally tracked down to improper checking of child termination. Problem extends far from PXD to other daq daemon on HLT, ERECO, DQM
 - Several other problems in code found and fixed
 - Still doubts about thread safety. (→ seldom random misbehaves)
- New issue: ‘crashes’ for large ROI packets + high rates.
 - ‘PXD Error’, but origin again on HLT (hltout2merge).
 - Issue found and fixed in Dec: Improper use of non-blocking sockets & return values/error codes not properly checked.
- No test system, problems can only debugged on running HLT unit :-((((((((((((
- Having bugfixes installed on HLT is a cumbersome, error prone, long process...