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BPAC 10/2016 on DAQ Integration
PXD recommendations in the report

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PXD TB, 16.12.2016

- Overall: positive for PXD DAQ
- Not mentioned in report:
  - final hardware revision ?
  - DATCON vs. HLT ?
- 3 main discussion points (see next slides)

Line 363, 364, Section Event builder

"The ONSEN buffering capabilities should checked against the maximum estimated fluctuations."

what it means:

– buffering pixel data in Onsen, until HLT decision arrives
  (4 GB $\rightarrow$ about 50 seconds, if no HLT)
– former estimates (toy MC) were based on Belle I L3 trigger
  (t=1 s average, t=5 s maximum latency)
– safe against fluctuation e.g. events with high track multiplicity

answer:

– new numbers for HLT processing time (email exchange with Chunhua Li, Nils Braun, Eugenio Paoloni, ...)
– result: t>5 s only for rare events
– detailed numbers will be prepared for BPAC in february.

page 18,19

"minor concern": ethernet flow control between Onsen and EVB2

what it means?

– siTCP can not handle "pause frames" (sent from the Onsen-EVB2 switch to Onsen, if the switch buffer is full)
– any network interface on a normal PC can
– reminder: normal situtation, 1% occupancy, 32 GbE outputs average 6.25 Mbyte/s per link → should be uncritical (→ „minor“)

solution:

intermediate PC, receiving Onsen data by Aurora (not siTCP!), and then send out the data with "pause frame" handling (probably 10G)
prototype existing: ALICE C-RORC PCIe card (see backup slides)

– disadvantages:
  – another piece of complex hardware in the chain ("pre-event builder", FPGA–PCIe interface, needs huge RAM)
  – requires development (change of format to Aurora)
    → cluster-based format would have to be postponed (would not be available for phase II)

Line 711
appointment of a "PXD DAQ coordinator" is recommended

why is the question raised?

probably the "HTL send all flag problem" during beamtime
switched on by someone, not communicated, not written into logbook
(reminder: about 1/3 of April 14 DESY data are corrupted)
$\rightarrow$ can be solved by better usage of elog

discussion items:

- my personal impression:
  communication between DAQ group and PXD DAQ group is very good
- problems observed at PERSY are not DAQ, but frontend problems
  (links, grounding, etc.)
  $\rightarrow$ will not be covered by the PXD DAQ coordinator
- PXD DAQ coordinator should spend considerable time at KEK