Cornell University
Laboratory for
Elementary-Particle Physics

Pixel Online Software Lessons from CRUZET 1

Souvik Das
Cornell University

Vesna Cuplov
University at Buffalo, SUNY

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University at Buffalo
The State University of New York

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Run Number Collisions

When we do a Physics Run under RCMS, Level 0 FM fetches a Run Number from the RunInfo DB and sends it down to us. When we do a Calibration Run, we disengage our POS from central control and run using PixelSupervisor. PixelSupervisor adds 1 to the previous run number. This creates Run Number collisions in later runs.

Solutions:

- ✗ Use the Pixel Function Manager to run calibrations. This would introduce a new "Done" state in our FM. May need to port calibration code to Java. Bad idea.
- ✗ Allow Level 0 FM to run our calibrations. Register various "Run Keys" with Central Run Control that could get passed down at "Configure" time to signify which calibration we should be doing. Would have to wait for other subsystems to go through the FSM states.
- ✓ Book Run Numbers from PixelSupervisor! This is not readily possible because a C++ API is not available and we're not advised to write. A Java application must help PixelSupervisor to do this.
  - The Cathode Strip Chambers' online software does this. Am working with Karoly Banicz of CSC to make this work for us.
  - The RunInfo DB is unavailable from outside Point 5. PixelSupervisor must recognize when it should retrieve Run Numbers from DB and when it should make it up. This can be encoded in its Configuration.xml file.

Un-configuring Unused FEDs Appropriately

To calibrate the Pilot Run Detector we used a different FED from that used with the PIB. However, the FED of the PIB continued to send SLink data to the EVB even though it was masked off by Central Run Control! We do not un-configure FEDs we do not use in a given configuration to ignore triggers.

Solution:

- Set the FED Mode register to not write to SLink in the FSM “Halt” transition / “Halted” entry function.

Loss of Logging Information

When running under Run Control, Job Control is used to spawn our XDAQ processes. This leads to the console output of these XDAQ processes to disappear down Job Control's log. Job Control overwrites its log file and thus we lose all logs.

Solutions:

- Giordano and Laurent have reported success in getting the Error Dispatching mechanism to work at Point 5. We do not have a DB yet to store the errors (Laurent and Umesh hot on the trail?). However, the Global Error Dispatcher writes out XML log files stamped with date and time.

AND

- Contact Alex to ask if Job Control can be made to output its log into separate files.

Monitoring FED FIFOs

Error FIFO: Stale events in the Error FIFO .err files observed. I admit I didn't understand the retrieving of the Error FIFO in PixelFEDInterface and blindly wrote the contents of the buffer (+ more bytes?) to file. Will sort this out with Will.

Spy FIFO 3: A controlled pre-scaling is in order.

TTS FIFO: In the light of one incident where we went into an sTTS BUSY state, it might be useful to write the TTS FIFO's contents to file.

Anders will write a new configuration object that specifies which FIFOs will be monitored and with what pre-scale.

Disk Space, Baseline Correction, Basic DQM Capabilities

Disk Space: We could do with the TB disks in the next run. I had to tar, zip and move several previous installations of RCMS and POS into my sdas area. Karl is on this.

FED Baseline Correction: We could look at its variation over the scale of days as suggested by Anders. Viktor will work on a ROOT program. (I might try to put it in the FED Low Level GUI if I get time.)

DQM Plots: Perhaps some basic DQM capabilities would be useful for the next run for producing occupancy plots etc? Simple ROOT scripts would do too.

Some operational remarks after CRUZET #1

- **Should a shifter re-calibrate the detector when needed?**

  Study of the Baseline drift versus time. In /PixelRun directory, there is already a tool that can be implemented to do this study.

- **Shifter's account on cmsusr0 ?**

  Account is needed to monitor the voltage, current .... from the CAEN power supply via a terminal.

  Not needed when we will use the DCS (Charle's GUI to monitor voltages...)
  Will need to install PVSS at p5 to run it from Linux.
  Some sub-detectors already run PVSS on Linux.

- **GMT DST Potential Confusion**

  Warning: The baseline monitoring text file which records the correction is in GMT. However, the computer desktop shows the DST.

- **Transportation**

  All sub-detector will have the same shift schedule? Common transportation can be arranged for the 3 type of shifts?