Online SW Readiness (or not)

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- Recent developments
- Database
- Calibrations
- Rates
- Status panels
- Monitoring
- Miscellany
- Summary

Summary of Recent Developments (1)

- Moved to tdaq-01-08-04
  - Mainly a bugfix release, but also changes in GNAM API
    - Required corresponding changes in our GNAM programs
  - NB tdaq-01-09-00 some time in April...
    - More changes: eg eformat, ers, run control
    - More pain for test rig maintainers?
- Calibrations
  - JEM timing scans better integrated with COOL & TDAQ
  - Work on CP scans, including CAM
  - Refinement of PPr DAC scans and analysis tools
  - Recent update of PPr readout pointer scan
    - Now sets real time delays to align signals correctly

Summary of Recent Developments (2)

- Playback tests
  - Fixes to CMM simulation
- Status
  - Minor improvements to IGUI module status (errors->red!)
  - More/better information from some modules
- COOL/CORAL database
  - Prepared for move to Trigger Configuration DB
    - But not actually done yet: not enough time to resolve remaining Athena/TDAQ issues when building in L1Calo packages
  - Added more run types for CPM/JEM calibrations
    - Not yet used by those timing scans yet though
  - Regularly using ACE to browse and edit COOL folders
    - Positive feedback from users so far
    - Scripts still available for bulk editing if required

Summary of Recent Developments (3)

- OKS database
  - Crates, modules, cables are now resources
    - Enable/disable via IGUI Segments&Resources panel
      - L1Calo ModPars panel to be removed soon
    - Resource groups: disabling Slink propagates to ROD&ROS
  - DB generation script now fairly complete
- Miscellaneous good intentions
  - Adapt TDAQ/LAr tool to extract cables from TC DB
  - Still intend to slim down old style run types in OKS

Use of L1Calo COOL DB Offline

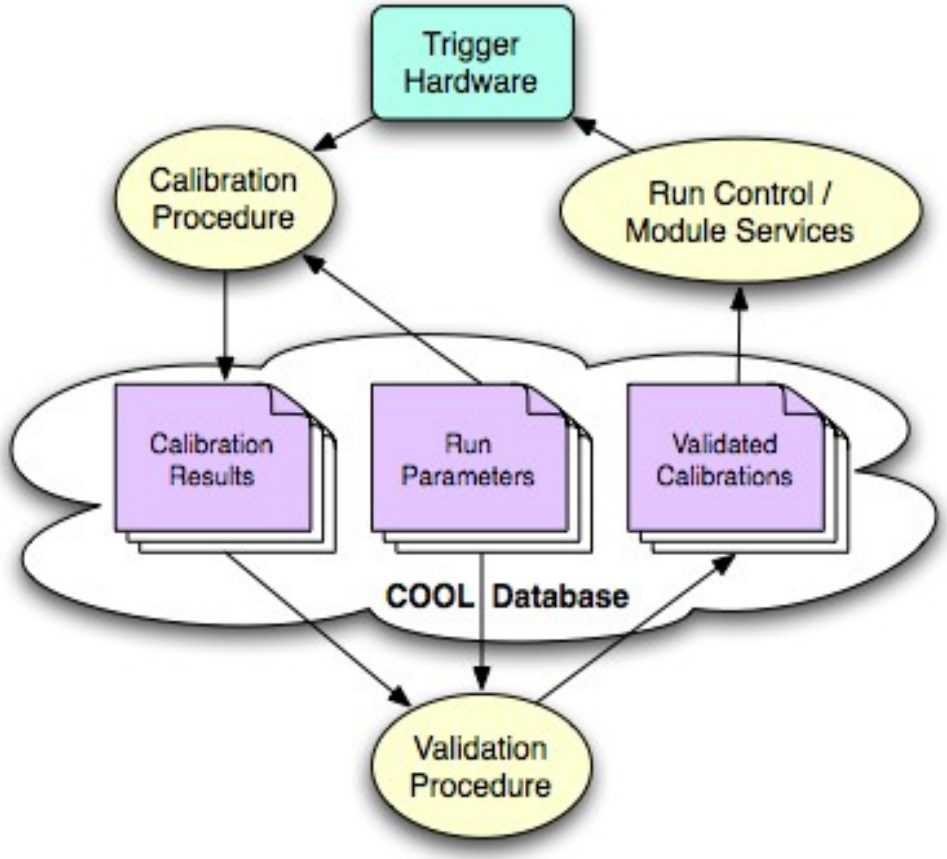
- Still using local sqlite file in the online software
  - Reluctant to put existing folders into online production DB while we still expect to make significant changes
- But copy of sqlite file has been read by Athena
  - Needs a few modifications to online conventions:
    - Folders likely to have single rows should not use channel ID zero
    - Folder description (metadata) needs to be set for Athena
- Use of Oracle development DB tested
  - Needs CORAL_AUTH_PATH set in online world
  - Performance tests still required

Offline Access to Online Information

- Online OKS DB saved to Oracle in two ways
  - oks2coral: direct copy, intended as backup and restore option for online version, really needs online SW to read it
  - oks2cool: supposedly Athena-friendly copy
    - but not sure how much SW exists to read it and understand what parts of L1Calo might be disabled
    - little project for someone?
- L1Calo COOL folders organised by date/time
  - Athena might like link to run/lumi block
  - Standard COOL folders exist with information about runs
    - Could link this way?

Calibration Procedures and Folders

- Calibration procedures
  - controlled by run pars
  - write to Results folders
- Run control
  - uses Validated folders
    - may use Results folders if requested by run pars (PPM) and suitable SW is written
- Validation
  - controlled by run pars?
  - copy/merge results to validated calibration



COOL Folder Organisation

- Basic path
  - /TRIGGER/L1Calo/category/prefix/folder
    - category is Calibration, Results, Configuration, RunPars
    - prefix is "Physics" (original idea to have others: Cosmics, Tests)
      - but SW presently requires the whole set of folders with the same prefix
- Folders for each module and type submodule
  - Eg CPM, Serialiser, PPrMCM, PPrAsic channel, etc
  - One row per separate object (eg >7000 PPr channels)
  - Basically a direct copy of the old scheme
  - But values that need to be common across the whole system (eg readout settings) are replicated identically many times
  - For historical reasons, PP information is split into three separate folders at each level
    - Planned to change this for some time – but still not done yet

COOL Folder Reorganisation (1)

- Preprocessor
  - Single folder of default values
  - Single folder of validation calibration results
  - Run pars to choose how to use the results
  - Validation mechanism getting urgent
    - Needs to cope with partial calibrations (eg timing of HEC-A only)
- Could have folder(s) of system wide properties?
  - Eg readout pointers (remove from module level)
- Abolish "Physics" (as level in folder path anyway!)
  - Separate folder of timing adjustments for Cosmics
    - Steered by global run type
  - Other global changes via Run Pars

COOL Folder Reorganisation (2)

- Dead channels and deliberate disabling
  - Have folders for CPM and JEM dead channels
    - Switch off problem channels in both core and fanout regions
  - PPr channels only disabled by flag that calibration failed
    - Keeps FADC, zeroes LUT
  - Should have separate folder of PPr channels to disable?
  - For tests, also useful to have a mechanism to switch off large areas
    - Probably best as RunPars (or IGUI selection?)
    - partitions FCAL1/23, HEC/EMEC, EM Overlap, EMBarrel, Tile EB/LB on A/C side
    - needs support from channelMappings and links to COOL channel IDs

Run Parameters

- New L1Calo run parameters folders intended to replace old OKS run types
  - many folders, one per type of run
  - different channels for variants (long/short calibration)
- Its already getting a bit complex
  - We keep adding parameters
  - Will probably need more
    - eg control disabling bits of the calorimeter for timing scans
      - trigger on one calo partition in limited eta, phi region
  - Either
    - Rejoice in the flexibility we will have?
    - Or try to eliminate possibilities that are not crucial?

Validating Calibrations

- Validation Procedure (same/similar for all modules)
  - Set of criteria to apply
  - Update whole calibration at once or channel by channel
    - Former probably needed for readout pointers, real time delays
    - Latter probably fine for PPM DAC settings
  - Where to do it?
    - Copy offline calibration results to online DB and validate online?
- Validation Framework (C++)
  - Common software framework if possible
  - Read run parameters and process folders
    - May need custom classes in some cases
    - Default behaviour otherwise
- What we have right now...
  - Blind merge of results to validated folder ("useCalib")

Analysing and Tracking Calibrations

- Most of our calibrations produce histograms as well as the calibration results
  - Need to store these, eg monitoring data archive
- We still need tools for tracking successive calibrations, checking trends etc
  - Extension of validation?

Calibration Frameworks?

- We have a bit of a mess here really
- Started off with standalone "kicker" programs
- Intended to move everything to multistep runs, monitoring streams and GNAM
  - Never really got there coherently (except PPr)
  - And never developed a better framework for running standalone calibration programs
- De facto decision to stick with standalone style
  - Could really do with providing a nice framework
    - Fresh start, TDAQ controlled (state aware) application?
    - Improve/generalise the "kicker" legacy?
    - Use Florians run plan actions everywhere?
  - And migrate existing calibrations into it
    - It seems rather late (but we always say that)

Rate Metering

- Need SW for configuration, readout, publication to IS and display of rates from preprocessor and CMMs
- Architectural options:
  - long foreseen to use regular status readout by run control
    - single process operating in the crate
    - easier SW updates
    - only runs when a normal TDAQ partition is running
  - alternative is to use separate process ("initial partition")
    - runs all the time (still TDAQ, but independent of partition)
    - need sysadmin to restart in case of SW update
    - possible conflicts between processes controlling the same modules
- Display via TriggerPresenter foreseen
  - Do we want to develop our own display as well?

Status Displays & IGUI Panels (1)

- Existing L1Calo IGUI panels are rather old
  - Designed for the slice test, small numbers of modules, easy dynamic reconfiguration by experts, etc
- Ideas for improvement
  - Some recent modest tweaking of module status
    - But no overview of the status of the whole system or a crate
  - Also need a rethink of what run parameters should remain easily changeable by the user
    - Keep a few basic things (L1Calo run type/parameters)
    - Test vectors (maybe only active for playback type segments?)
  - How to save remaining run parameters (and status)
    - Either save IS to COOL conditions DB
    - Or get panel to update OKS database (already archived)

Status Displays & IGUI Panels (2)

- Possible additional panel for calibration
  - Need a fairly simple and reliable way for shift crew to run various calibrations
  - Not easy at the moment
    - Different scans run in different ways in different frameworks
  - Could try for run plan style driven by the IGUI?

Monitoring

- We have monitoring in both GNAM and AthenaPT
- Many "shift" and masses of "expert" histograms
- Still really need to review whats important, whats missing, whats superfluous
  - Those around for M6 should have a look and comment
- Key developers are moving on to other things
  - Hopefully the frameworks are now mature enough
  - But we will need to be able to add new plots rapidly
    - Today we may like more plots related to PPr timing
    - Tomorrow we will want something else…
    - Important to keep a pool of monitoring expertise
- Further developments required?
  - More links to DB, more use of Data Quality framework

Bytestream Decoders

- We have separate offline and online decoders
  - Both need maintenance
  - Are there new features required?

Point 1 Setup

- Common accounts (eg "l1calo") now deprecated
- We have to (re)start using personal accounts
  - With suitable setup so we can all use common SW
- In future new users will get all accounts at once
  - point 1, logbook (not sure about DCS)
    - probably still need to register domains of expertise, ie who counts as an expert or shifter for which areas of responsibility

All the Usual Stuff!

- And no we didnt enable bus errors
- Or use hardware byteswapping in our CPUs
- Or move to ROD Crate DAQ run controllers
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-
- Or write much more documentation

Summary

- Still lots of database work to do
- Both online and making accessible to Athena
- Also urgent to get calibration procedures smooth and to address calibration validation and tracking
- Monitoring of rates is still missing
- Many other improvements, eg status, desirable
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- Technical documentation and user guides still need to be provided in many areas