COMPUTING & SOFTWARE

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COMPUTING & SOFTWARE

- Controls & Monitoring
  - H/w controls, Run Control, archiver, alarm handler….
- Online
  - Trigger, DAQ, Readout monitoring, online reconstruction
- Offline
  - Detector reconstruction, simulation, globals
- Infrastructure
  - Data curation, processing, database, networking

Controls & Monitoring

- Several changes, fixes, improvements
  - QPS, Archiver, alarm handler
  - Channel & Run Control IOCs
  - New target interface
  - Some issues to address with communications, alarm handler, RC workflow, and robust operation
- More from Pierrick...

Online

- DAQ readout & software:
  - Software: stable
  - Hardware: some glitches
  - Hall probe readout now in raw data
    - Relies on hall probe data (C&M PVs) being available
- Trigger:
  - New firmware was developed: requires beam to debug
    - Tracker readout needs to be updated, integrated & tested
    - Note: will introduce changes in reconstruction
- Online Recon: automagically always runs, needs some structural tweaks to handle changing config
- Operations: need more trained local resources for first-response
- More from Yordan…

OFFLINE

- Reconstruction
  - Currently @ MAUS v2.6.1
  - Detectors reconstruction software stable, tracker fixes and improvements since July field-on data
  - Global (matching) now in MAUS
    - Propagation slowness & performance being studied
  - Geometry & Fields:
    - Default field map does not include PRY effect
  - Event-viewer development: v1 now shipped with MAUS
    - Working on integrating it with online framework
- Resource issues: several students leaving/left (track fitting, globals…)
- More from Adam…

Infrastructure (Spares, Monitoring..)

- Need to ensure availability of hot-swappable spares
  - And the change-over must be tested
  - Tracker:
  - Need h/w card for tracker IOC to be hot-swappable
  - Need spare fully working VME buffer board
  - Have 1 working & 1 'partly' working spare
- Nagios-monitoring beefed up
  - Need to integrate critical ones with alarm handler

Infrastructure (Database)

- Absorber table implemented & information being written to by Run Control
- Geometry corrections table implemented
  - Analysis-based, disentangles “hall survey” from alignment
- Reconstruction quality table:
  - To flag quality of reconstruction run-by-run for each production version
  - Implemented on pre-production server, tested for TOF, EMR
- Cooling channel information
  - Has been in CDB for a while
  - Written to by Run Control
  - Some issues to address – sometimes not written, or improper information

Data Processing

- Offline reconstruction now routinely done in MLCR
  - Bundled with ROOT output, logs, geometry…
  - Automatically triggered at the end of each run
  - Official recon output available for use shortly after a run ends
- Some issues have shown up this user cycle
  - Related to both online DAQ & C&M workflow
- Want to make this better
  - Include reconstruction plots with output bundle
  - Reconstruction quality flags will be tested & deployed during shutdown

Monte Carlo

- MC lagging behind real data reco/processing
- Problem found with quad field description in geometry
  - Problem Fixed
- Issue with distributions going into TKU
  - Being worked on
- At the time of CM43, MC production was stalled
- Dimitrije Maletic (Belgrade) has now stepped in as MC production manager
  - Rapid progress
  - Some representative runs already through GRID w/ latest MAUS
    - Brought some issues to light e.g. output files too big [we have a solution]
  - Book-keeping & structural improvements (node utilization) will come
  - Allows us to provide for the needs of various analyses
- Next priorities: Inefficiency in transport D2->TOF & Speed

MC Processing

- Since CM44
  - Have MC production manager (Dimitrije Maletic)
  - Now able to push simulations through GRID
  - http://micewww.pp.rl.ac.uk/projects/analysis/wiki/MCProduction
- Issues
  - Beam-input is the main inefficiency now
    - Limited libraries available
    - No libraries (yet) for the "pion beam" settings: starting to take over & automate the workflow so it can be pushed on the grid
  - Inefficiency in G4BL hand-off, but can be addressed after smooth production established
  - MC speed remains an issue though not a problem on GRID

Summary

- Major improvements in all areas
  - Run Control, channel IOCs, network stability
  - DAQ stable, prescale trigger capability in development
  - Improvements & optimizations in track recon.
  - Fast-reconstruction routine & stable
  - MC production in a better place, improvements to come
- More effectively serving physics