

MAUS & DATA PROCESSING

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MICE VC178

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MAUS

- MAUS v1.0.0 released August 2
 - Processing speedup implemented
 - Track reconstruction improvements
 - Updated tracker mapping & calibrations
 - New online reconstruction framework
 - Partial memory leak fixes

MAUS Speedup

- Processing time with MAUS was extremely slow.
 - Profiling showed that the bottleneck was in string conversion when passing data from inputer to reconstruction modules to outputer
 - Meant that online reconstruction could not keep up with data
 - Offline processing took day(s)
- Speedup implementation:
 - Removed string conversions
 - JSON string output for debugging still supported
 - Framework refactored to exchange C++ data as default
 - Reconstruction modules & Reducers refactored
 - GlobalReconstruction reducers pending
 - Simulation code refactored
 - Some digitization modules remain to-do

MAUS Speedup

- MAUS-v1 is ~60-75x faster than previous version
- Processing speed is within the data taking rate
- Deployed pre-release in MLCR during 01b
 - Reconstruction kept up with trigger rate even for reference runs
 - Was in testing mode, not automated
 - Tracker VLSB zero suppression is on [default]

Data Processing

- The data processing scheme thus far:
 - Take data → compact → move to micestore → copy to tape → process on GRID
- With the speed improvements to MAUS, we plan to have reconstruction running in the MLCR
 - Data-taking and reconstruction happen in parallel
 - Use miceonrec03 a hot spare for OnRec & OnMon
 - Run “physics devil” analysis on reconstructed output
 - Make reconstructed + analysis output available via http
 - Requires some scripting for automation and http publishing
 - Does not replace GRID (re) processing

Data Processing: Status

- First reconstruction of StepIV data from June-July has now been completed
 - ~80 runs in total, starting from Run# 7066
 - List of “good runs” from 01a generated by Ryan Bayes (Issue #1720)
 - Tracker mapping “fix” for 01b data provided by Ed Overton & Chris Heidt (Issue #1721)
 - Tracker maps & calibrations specified through data-cards
 - Excluded some runs from early June when TOF1 was off & tracker readout was being commissioned
- MLCR processing took ~14 hours
- Janusz has also processed them on the GRID
 - Took a “few hours” on the dedicated Tier-1 queue at RAL
 - One job was aborted – suspect memory leak, investigating
- Experts, analysis folks please take a look to validate & report issues so that we can fix before next data taking

Data Processing: Status

- Data from GRID processing can be downloaded from the IC server:
 - <http://gfe02.grid.hep.ph.ic.ac.uk:8301/RECO/MAUS-v1.0.0/>
- OnMon & OnRec plots are available as usual with the raw data tarball
 - <http://gfe02.grid.hep.ph.ic.ac.uk:8301/MICE/Step4/>
- Please take a look at the output to ensure that it's what's expected.
- Please provide feedback and report any issues so that we can fix them in time before September data taking & also reprocess

Status & Plans

- Some things to do before Sept. running
 - Get tracker map & calibration into CDB
 - Currently data-cards
 - Release Step IV geometry
 - Nearly there, Ryan Bayes has asked for expert feedback (Issue #1439)
 - Fix remaining memory leaks
 - Automate MLCR processing
 - Update online reconstruction quality plots
 - Ready-by date of Aug 24 for all code changes

Summary

- Lots of improvements to MAUS framework
- MAUS speedup completed & processing speed is not an issue anymore
- First processing of StepIV data completed