DQM4HEP Monitoring Status

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AIDA-2020 Second Annual Meeting
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DQM4HEP

Data Quality Monitoring for High-Energy Physics

- Generic C++11 framework to perform online data analysis and data quality reporting
- Focus the physicists on the data analysis, the DAQ engineer on DAQ binding, and the shifter on monitoring tasks. Let the framework deal with online application workflow, interprocess communication and memory management.
  - Project page: https://github.com/DQM4HEP

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Slide by R. Ete, A. Pingault, L. Mirabito

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Current Status

- No major developments or tests *ready to show* right now, Rémi and Antoine doing lots of work behind the scenes
- Groundwork for the online interface has begun
- “Mini-milestones” proposed, to track development and provide a better timeline
- Tutorial given at BTTB 2017, which will form basis of user documentation
- Have begun writing abstracts to submit to conferences

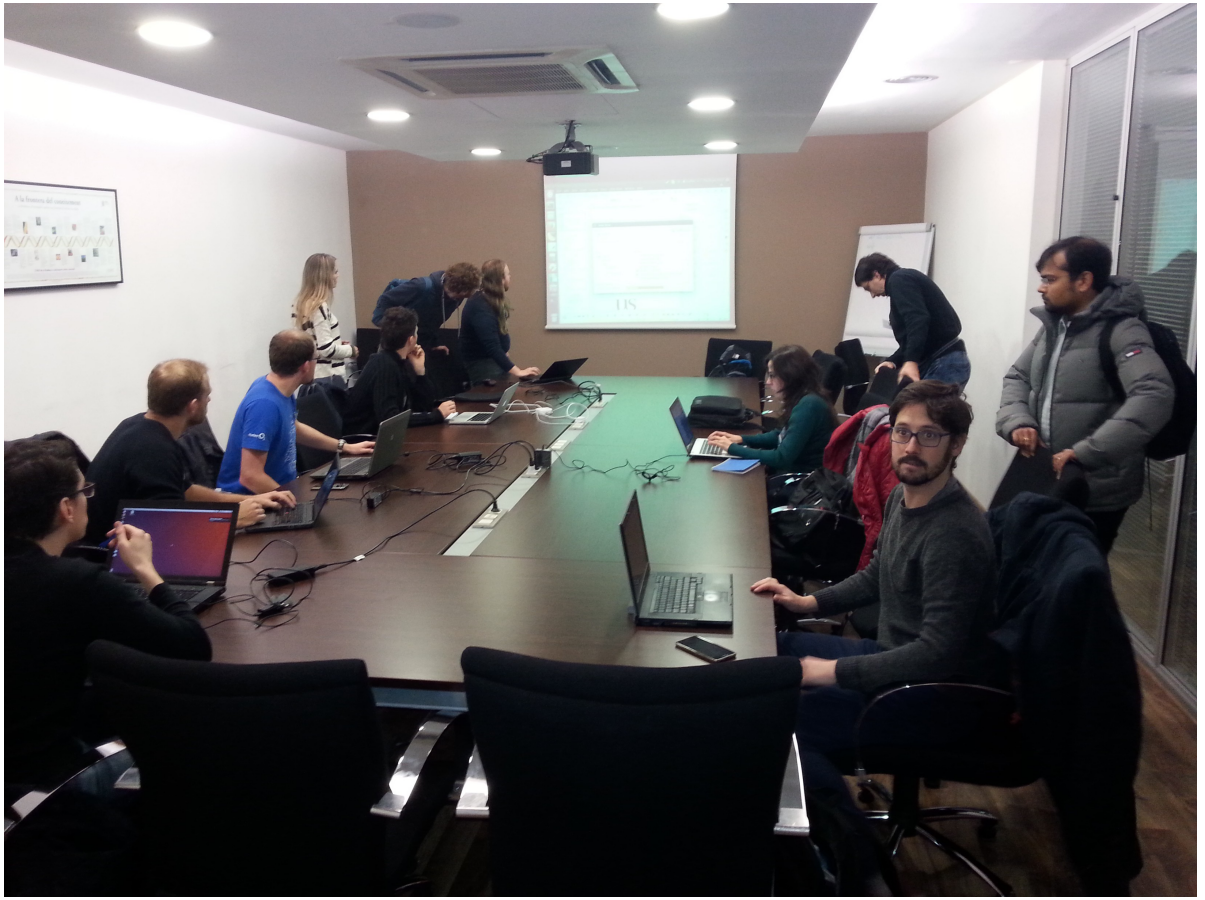
Current Status

- Refactoring of the network layer, job control, and run control – almost finished
- New unified interface for configuration of processes via DB, XML, JSON, etc. – started
- ROOT serialisation will be removed – this will reduce buffer size and improve network performance – started
- Performance monitoring GUI – monitor RAM, CPU, network usage; events treated, etc. – not started
- All in separate branch – does not disturb main/current

Mini-Milestones

- MON-1 – Frozen "working version" of DQM4HEP for development and testbeam use
  - Target: End of February (not formalised yet)
- MON-2 – Online stream interface from EUDAQ
  - Target: End of May (c. AHCAL testbeam)
- MON-3 – DQM4HEP responding to EUDAQ run control
  - Target: End of July (c. ECAL and AHGAL+HGCAL testbeam)

DQM4HEP Workshop



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DQM4HEP Workshop

- Ran a DQM4HEP hands-on session at the Beam Telescopes and Test Beams workshops in Barcelona
- Around fifteen people attended the 90-minute session
- Copies of a virtual disk image of Ubuntu with DQM4HEP pre-installed were distributed
- Ran slightly short on time but most major areas were covered, with hands-on section for running the framework
- At very least, gave everyone the necessary knowledge to start using the framework!

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DQM4HEP Workshop

- The contents of the hands-on session are available on the Indico page *here*
- Virtual disk image with DQM4HEP pre-installed not available there (since it's around 8GB), but can be made available elsewhere if useful or needed
- The hands-on session will form the basis of a user's guide to the DQM4HEP framework, in addition to the developer documentation that Rémi and Antoine are writing
- Some things are still subject to change

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Conference Abstracts

- Started writing and passing around abstracts in preparation for conference submission
- Will help to expose people outside AIDA-2020 and the immediate community to the tools
- Still open to edits in the abstract, so please read (either now on the next slide or later) and send any suggestions or changes you may have
- Still drawing up a list of conferences to submit to (again, please send any suggestions!)

Abstract Draft

There is currently a lot of activity in R&D for future collider experiments. Multiple detector prototypes are being tested, each one with slightly different requirements regarding the format of the data to be analysed. This has generated different ad-hoc solutions for data acquisition and online data monitoring. We present a generic C++11 online monitoring framework called DQM4HEP, which is designed for use as a generic online monitor for particle physics experiments, ranging from small tabletop experiments to large multi-detector testbeams, such as those currently ongoing/planned at the DESY2 or CERN SPS beamlines. We present results obtained using DQM4HEP at several testbeams where the CALICE AHCAL, SDHCAL and SiWECAL detector prototypes have been tested. During these testbeams, online analysis using DQM4HEP's framework have been developed and used. We also present the currently ongoing work to integrate DQM4HEP within the EUDAQ tool[1]. EUDAQ is a tool for common and generic data acquisition within the AIDA-2020 collaboration. This will allow these two frameworks to work together as a generic and complete DAQ and monitoring system for any type of detector prototype tested on beam tests, which is one of the goals of AIDA-2020.

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Targeted Conferences

- Current “shortlist” of conferences:
  - International Workshop on Advanced Computing and Analysis Techniques (ACAT 2017, Seattle)
  - European Physical Society Conference on High-Energy Physics (EPS-HEP 2017, Venice)
- As before, please suggest any relevant conferences!

Summary

- No tangible new results ready to show right now, but:
  - Rémi and Antoine are continuing development
  - Lots of progress in outreach, publication and documentation
- Work has been delayed recently due to other commitments, but ready to work on establishing the online streaming interface
- Expecting work to proceed more smoothly now, with more time to devote to EUDADQ/DQM4HEP development

Thank you

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