LHCb Data Quality Monitoring

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- LHCb DQM software(Monet) present per-run detector performance histograms to DQ shifter
- DQ shifter can either accept or discard runs
- In case of any problems shifter can submit operation logbook entry

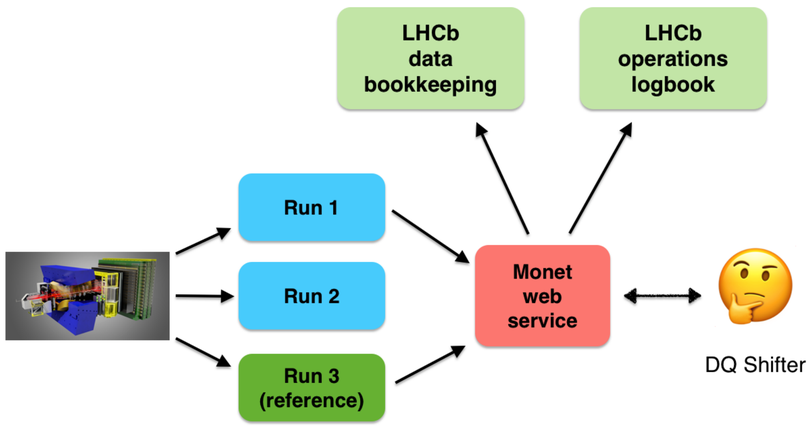

Figure 1: LHCb DQM workflow

Code upgrade

Major code rehaul of DQM software was finished recently. It is depicted on Figure 2. Pros and cons of such update include:

+ Shifters now can work from anywhere (previously: only LHCb pit)
+ Fast deployments (no need to re-compile and re-distribute)
+ Storing monitoring page descriptions in DB provided almost-seamless transition
+ Easily reusable for other monitoring tasks such as verification of simulation software upgrade or verification of data selections changes.
– Need to convert root's TH1 to different representation native to drawing library(Bokeh)
– Re-implementing logic takes time

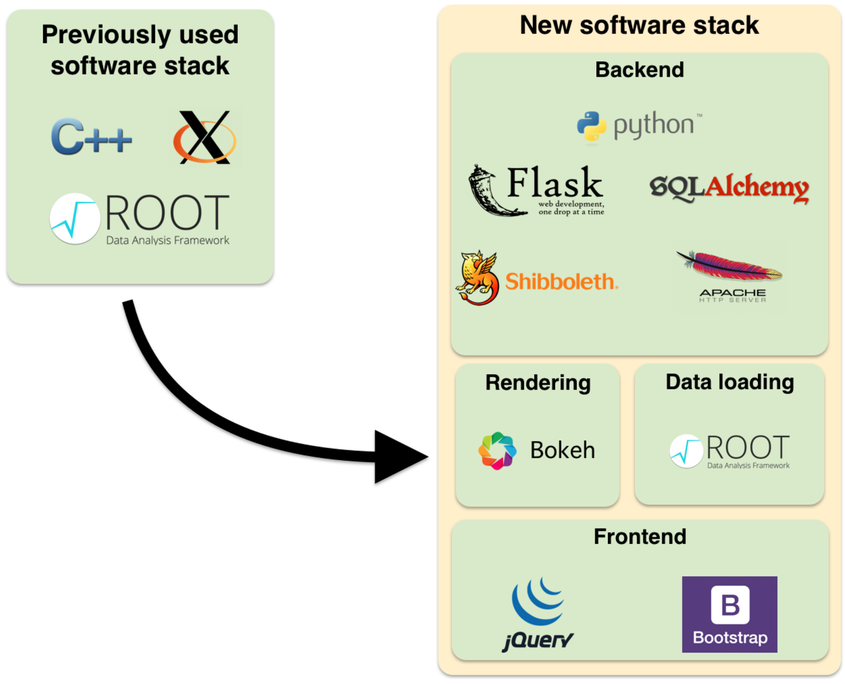

Figure 2: DQM software upgrade

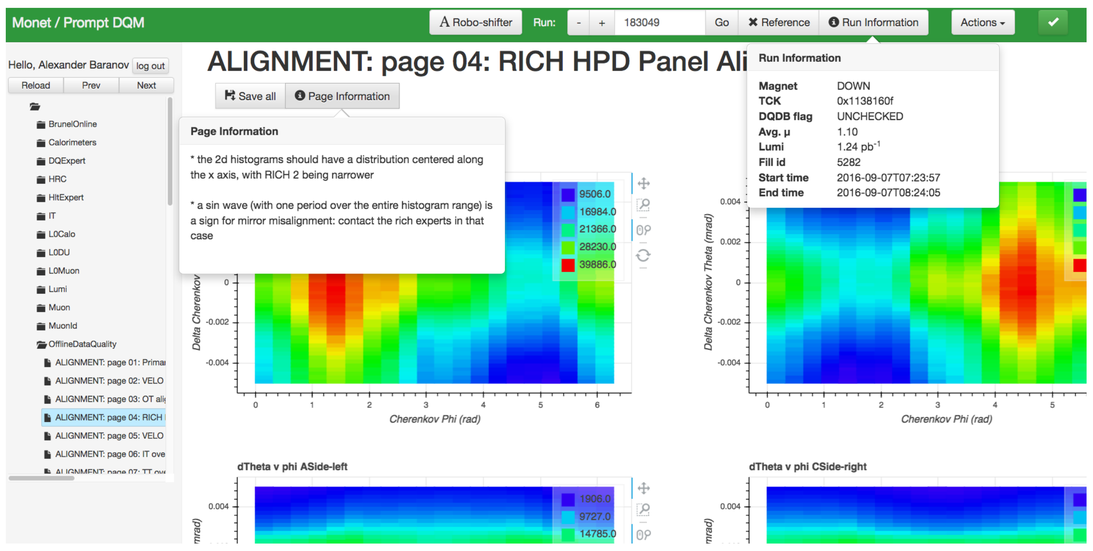

Figure 3: Interface screenshot

Robo-shifter

- Robo-shifter is machine-learning based system designed to assists the DQ shifter
- Given run data it can predict probability of run being good or bad
- Provides potential problem sources extracted from decision trees
- Integrated in DQM service interface:

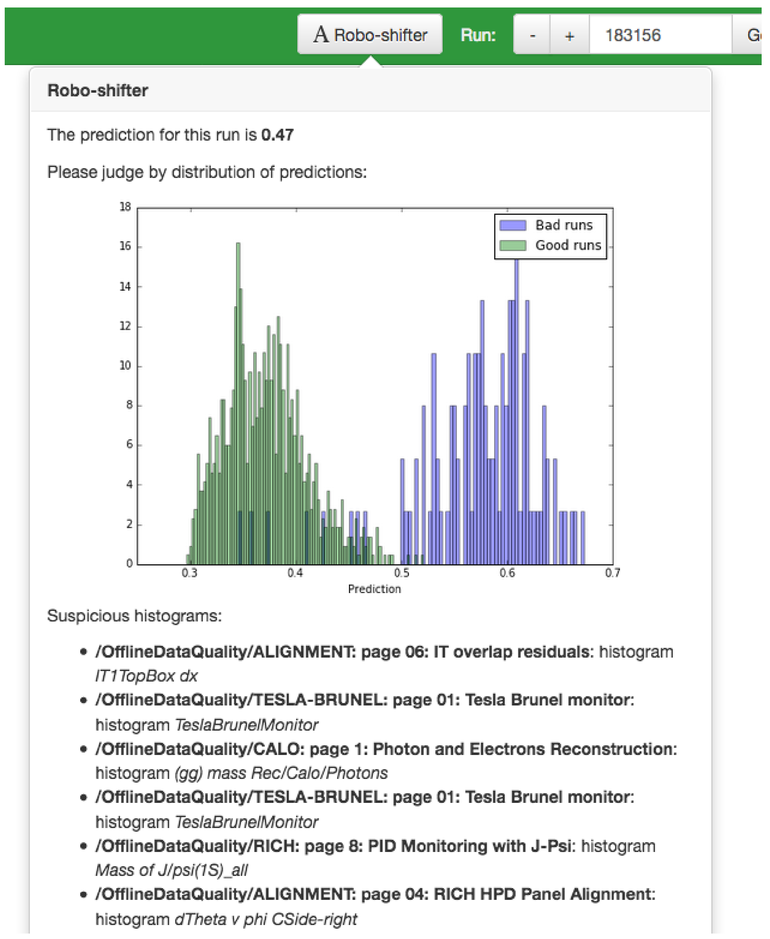

Figure 4: Robo-shifter interface

The first version of robo-shifter is currently being tested by the DQ shifters, who use it to identify bad data more efficiently.

Conclusions

The LHCb Data Quality Monitoring service has been successfully upgraded with modern web technologies enabling performing the shifts remotely, from home institutes. The exploitation of modern python libraries has allowed a fast development of new features with limited staff.

For the 22^{nd} International Conference on Computing in High Energy and Nuclear Physics, CHEP 2016, hosted by SLAC and LBNL, October 10-14 at the San Francisco Marriott Marquis.

Authors: **Alexander Baranov**[1], **Alexander Panin**[1], **Alex Pearce**[5], **Andrey Ustyuzhanin**[1,6], **Denis Derkach**[1,6], **Flavio Archilli**[2], **Marco Adinolfi**[3], **Wander Baldini** [4]

1. Yandex School of Data Analysis
2. Nikhef National institute for subatomic physics
3. University of Bristol
4. Universita di Ferrara & INFN
5. University of Manchester
6. Higher School of Economics