CMS Level 1 trigger DQM

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Outline

- Introduction to the L1T DQM
- Multiple system interaction
- Motivations for a new DB schema
- Data to be stored

Introduction L1T

The Level 1 Trigger Online/Offline Data Quality Monitor system as the purpose of:

Online:

- Monitor the operation of the Level 1 Trigger system in real time.
- Detect and identify problems and provide appropriate signaling.
- Provide information relevant information for data certification.

Offline:

- Provide accurate/extensive information offline about the data quality aimed at quality certification at the luminosity section level.

DQM and WbM interactions

- L1T DQM monitors trigger rates. To do so it uses fits done daily by the WbM system.
  - Fits (in the near future will) depend on trigger key and LHC conditions.
  - We currently retrieve the current fits from a temporary table on the CMS_TRG_R DB
- WbM in turn will (in the near future) select appropriate runs to fit based on L1T DQM certification.
  - Either by getting the final L1T offline certification or we will provide a table with that information

L1T DQM Online/Offline

- On both online and offline the need to have historically relevant fits for the rates is important
  - On the online we need to have access to the latest fits with the same LHC and L1 conditions that we are running
  - On the offline we need to access the latest fit for the specif run being analysis, again with respect to LHC and L1 conditions for that run.
- After the analysis offline we can declare if a run is good for fitting or not.

Test parameters

- Some of our tests need some kind of parameters that can change frequently.
  - Occupancy tests should not look at already know problematic areas (masking)
  - Synchronization tests depend on HLT pass-through which may change with the menu.
- Changing parameters, specially for the offline case, need to be associated with a new CMSSW release (long delays of implementation)

We would like to store this parameters on DB

Motivations for new schema

- Have an independent place to place information relevant for the L1T DQM operations.
- Provide a place where WbM and DQM can share information for data certification purposes
- Allow for further development of the L1T DQM in a compartmentalized way.

Schema Description

- Initially we predict 3 tables on the schema:
  - Fit parameters for L1T Rates Monitoring
  - Masked areas for L1T Occupancy Monitoring
  - Parameters for running L1T DQM applications

The priority is for the L1T rates, since there are temporary workarounds in place for the other 2 tables

Data storage estimation

Concerning data from WbM fits:

- I would expect ~100 L1 TSC/LHC pairs for 2012 running.
- For each pair we would need to store (128 algo +64 tech)+4 (fit parameters) floats. ~80k floats a year.
- They would be accessed
  - Online: Once every run.
  - Offline: Once every run time number of DQM reprocessing.

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Run certification for WbM fits.

- Run + LS range to be used.
- Similar size to a certification JSON file
- To be accessed
  - In the end of each run to write parameters
  - Daily by WbM to make fits

Summary

- We the L1T DQM team request the creation of a new oracle schema for our tools.
- The Data storage needed will be very small compared with other schema. (example SCAL).
- Access will be typically once a run per CMSSW module.
  - Online 4 modules running simultaneously.
  - Offline several jobs weekly.