# DQM

## plans for early 2010

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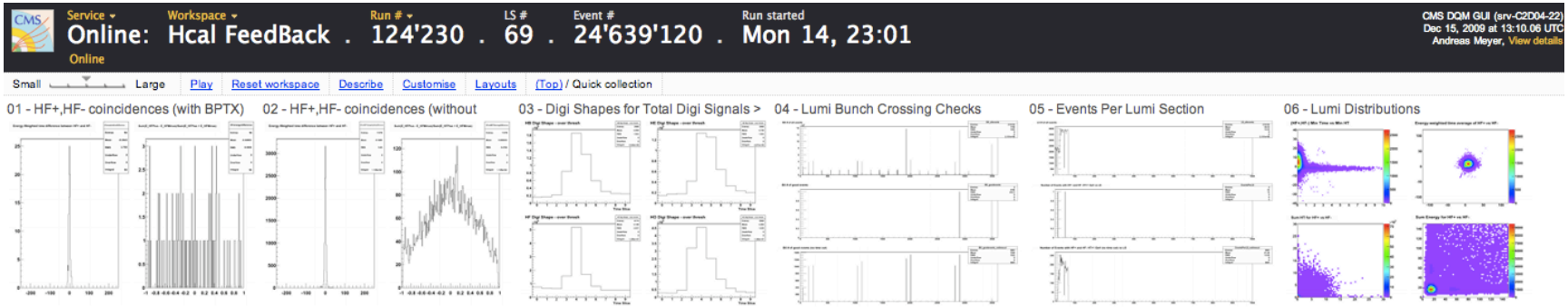
# Online DQM: Subsystem Integration Status

| Component | L1 | HLT | Pixel | Strip | Ecal-Presh | Ecal | Hcal | DT | RPC | CSC | HLX | Beam | Castor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DQM contacts | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Top-level Summary | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Shift Hists. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Shift Description | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| Actions | ✓ | ✓* | ✓* | ✓* | ✓* | ✓ | | ✓* | ✓* | ✓ | | | |
| Reference Histograms | ✓ | | off at present | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | |
| FED Integrity | ✓ | -- | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | -- | -- | |
| DCS Event-Info and Orcoff | | -- | work ongoing | work ongoing | work ongoing | | work ongoing | work ongoing | work ongoing | work ongoing | -- | -- | |

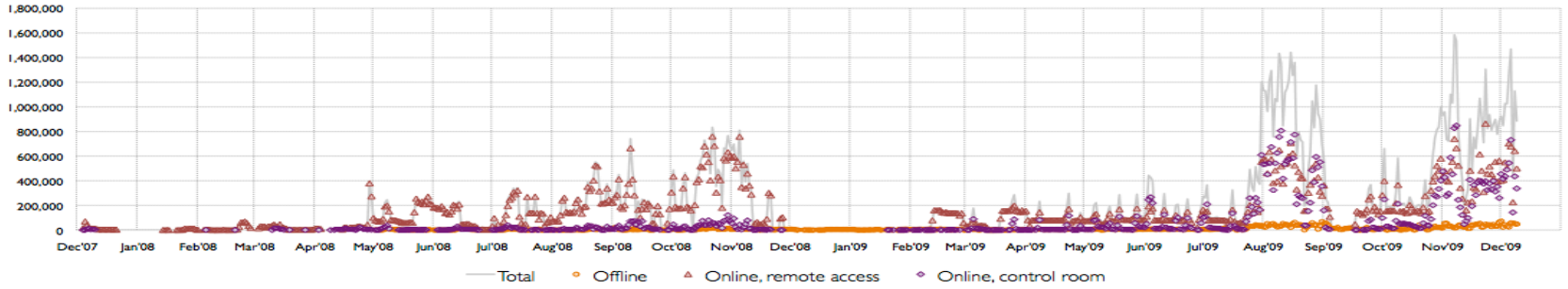
✓*: criteria when to contact subsystem experts are provided, but not always clear if good or bad

# Online DQM: Histogramming Code Plans

- Differentiate between different categories (shift layouts should have a good mixture of all of them):
  - errors (largely existing)
  - collisions feedback (vtx, timing etc., first version deployed)
  - detector "physics" overview (give shifts something to look at and learn from)
- HV and trigger selection
  - block / reset of histograms based on DCS and global CMS status (GT)
  - propose to encode HV and DAQ status in reportSummary: -1 no DAQ, -2 no HV, -3 no DAQ, no HV
- Limit number of plots per page to ~50
- Move config files into (tagged) subsystem code

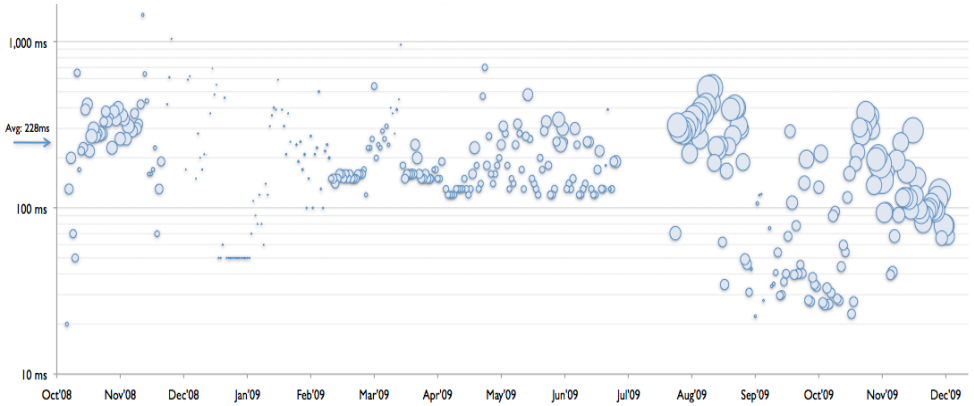


# Online Infrastructure: DQM GUI




**Up to 1 million http requests / day**

**dec 09: response time below 100 ms, even during peak load**




- GUI next steps: Further improvements of navigation and histogram viewing
  - use of provenance module application for transport / bookkeeping of conditions and provenance info
  - better navigation, inspection (e.g. top level frame, customization menus stick to glass, focus on single histogram) https://twiki.cern.ch/twiki/bin/view/CMS/DQMGUIMenuUpdate
- Handling/upload to files from other central workflows (CAF, manual harvesting)
- Looking for help: maintenance / deployment as well as cosmetics of front-end and back-end code

# Online Infrastructure: FU and SMPS code

- SMProxyServer

  **Srecko Morovic (Zagreb) + SM and FU developers**

  - New StorageManager for 3_5_X – no support for rate or "push mode"
  - SMProxy will be polling for events: probably on demand by consumers
    - compatible with stream-per-consumer plan, better for bandwidth
  - Support more flexible event selection (already in SM CVS Trunk), replacing "SelectEvents", for example:

```
TriggerSelector =cms.string( "HLT_MinBias* && !(HLT_EcalCalibration || HLT_HcalCalibration)")
```

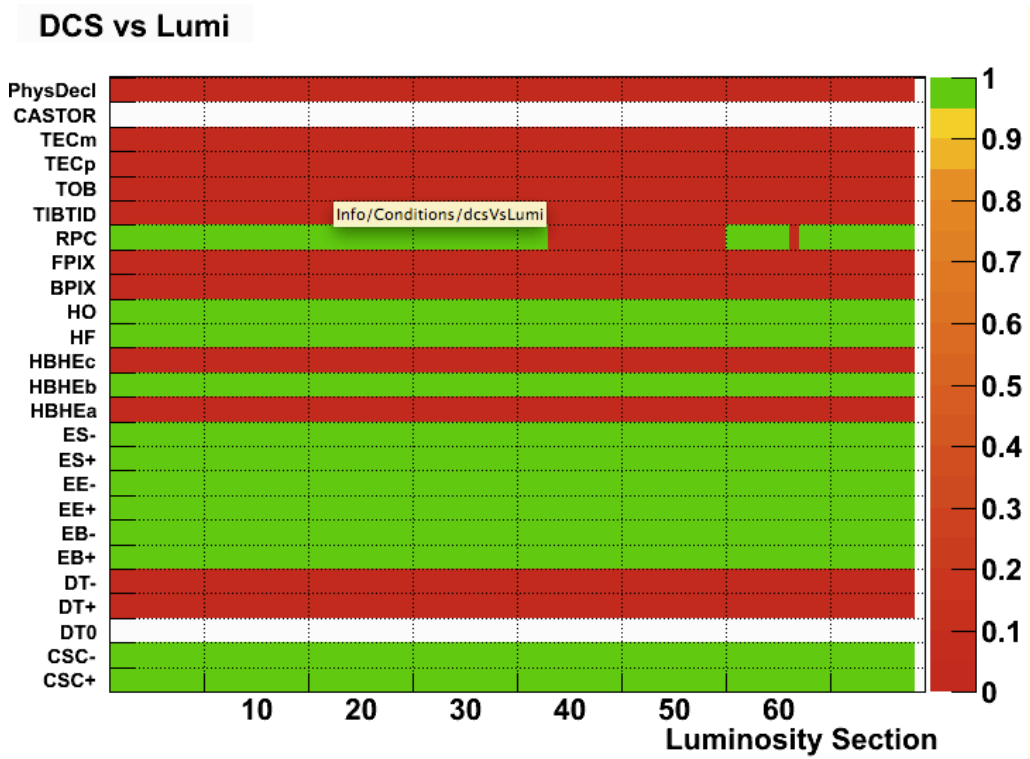
- FilterUnitProcessor v2
  - new implementation used by DAQ. Also used by DQM playback event source
  - Can jobs in child process and restart if crashed (manually or automatically)
  - Stop gracefully
  - Interesting for multiprocessing (>1 child): results collected by StorageManager
    - patched FUEP already does this in COW
  - dqmFM changes are needed to control this setup
  - currently in testing phase on our development system

- Histogram collection/summation from FU upon signal from EVM

  **SM and FU developers**

# Online: Other plans / todos

- **Complete workflow automation**
  - file shipping and permanent archive, log and core file handling
  - online files accessible offline / archive multiple versions per run
- **Injection of DQM results into database (OMDS and/or DIP)**
  - Lumi (HF) monitoring
  - Beamspot position monitoring
- **Core code improvments and clean up**
- **FED Integrity checking in HLT**
  - to be re-included in HLT menu
- **Documentation Campaign**
  - Improve shift instructions / shifts workspace (histogram descriptions, tutorial, tests, trainee shifts)



# Offline DQM – by-lumi certification

migrate DQM clients used in harvesting from endLumi to endRun

- check for crashes & fix them
- check for functionality

enable retrieval of Lumi products in EDMtoMEConverter

- currently extracting Run products in both endLumi & endRun
- not yet any Lumi product in this step

# Offline DQM – by-lumi certification

implement Lumi products in DQM sources

- start with one or two "test" sub-systems
- only a very limited number of histograms is possible !
- ONLY the histograms STRICTLY required for the by-lumi certification

implement analysis of Lumi products in DQM clients

- define limits, procedures, strategies

once possible issues & solutions are clear, launch campaign for all sub-systems

# Offline DQM Harvesting

- Offline DQM harvesting is working for Tier-0 processing only
  - Relvals included in prodagent through python API since CMSSW_3_3_4
  - Issues with naming conventions experienced - hopefully sorted out now.
- All other datasets (tier-1, tier-2) still require "manual" harvesting (as provided by the DQM group at a best-effort basis).
- Manual harvesting (cmsHarvester) has been proven useful for test and deployment of new features:
  - SL4 - SL5 migration (e.g. 340_pre5.6.7 and CRAB_2_6_6)
    - Reference histograms (from database) for individual datasets
      - all components existing
      - full automation being worked on
    - Code for quality test configurations per dataset and IOV being worked on

# Data Certification Storage

- Run Registry (Plans):
  - Add writing of by-Lumi information, in automated mode, for
    - detector HV status
    - beams setup (intensity, energy, luminosity)
    - data taking mode limited to a number of predefined cases
    - other info of immediate relevance for analyses (and presently only available on various twikis)
  - More plots producable in automated way (e.g. DCS status vs. LS)
  - Introduce "yellow" flags for manual certification (yellow meaning: bad, but usable ...)
  - Move to WBM

- DBS/DQM catalog:
  - By-lumi and by-dataset storage of automatic data certification in DBS (or later run catalog)
    - DBS / DQM catalog is NOT the same as Run Registry
    - Use of certification bits for analysis requires
      - analysis datasets to be functional
      - access / use of certification bits from within CRAB jobs
    - Development/deployment/operation of DBS / DQM catalog are not be in the responsibility of the DQM group.

# Summary

- Complete/refine full integration of subsystem code and documentation (online and offline)
  - Histograms categories: "errors", "fast feedback", "detector physics" *
  - HV and trigger selection: block / reset of histograms based on DCS and global CMS status (GT)
- Online DQM
  - Infrastructure: improve trigger selection (SMPS) | graceful stopping of runs (FU)
  - Injection of online DQM results in online DB and DIP (requested by lumi and beamspot monitoring)
  - FED integrity checking in HLT
- Offline DQM
  - By-Lumi certification: underway for 3_5_0 *
  - harvesting: Manual harvesting still required for Tier-1, Tier-2
  - Reference histograms from DB: all components existing | automation still being worked on
- DQM GUI: improved navigation and histogram viewing | workflows | maintainance tools +
- Data Certification: Run Registry: +
  - Relevant by-Lumi information being added
  - Introduce "yellow flags" (meaning: bad, but potentially usable)
  - Move to Web-based monitoring server (requires SL5 in online)
  - RR results are filled into DBS / DQM catalog using API provided *

\+ looking for help with maintaince

* x-activity