WbM Upgrade

Plans & Implications

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Recall: Web-Based Monitoring

Suite of tools to monitor CMS operations

- Both online and ex post facto

Web interface

- Easily accessible to collaborators both at p5 and away

Correlate/display non-event data

- Any data not directly originating from physics events
- Different sources and time-scales

Many more auxiliary services

- Some are needed for WbM to function
- Others are loosely coupled

Dec 2015 - Review of WbM

https://indico.cern.ch/event/463325/

Ensure long-term support of monitoring tools required for operating CMS efficiently

Review panel recommended

- Many (but not all) WbM services need to be preserved longterm
- Factorize core WbM into 2 parts: aggregation and visualization
- Some services should be continued outside of WbM (e.g. run registry)

Identified institutions (projects) to provide core deliverables

- Aggregation of non-event data (DAQ)
  - Rice University (Wei Li, Andrea Petrucci)
- Visualization of non-event data (Run Coordination)
  - Vilnius University (Valdas Rapševičius)
- Operations (Run Coordination)
  - WbM conveners

Nov 2016: WbM upgrade kickoff workshop

https://indico.cern.ch/event/548264/

Outcome of the workshop

- Unanimous on system high level design
- Agreement on primary internal & external interfaces
- Green light to proceed with prototype

New user interface w/ state-of-the art technology

- Portlet drag-and-drop
- Canned & customizable views

New acquisition concept for non-event data

- See next slides…

Focus on core services needed for monitoring CMS operations

- Rarely used/specialized services need to be reviewed case by case

Non-Event Data Sources

Current WbM gathers information from different sources

- DB, DIP, XDAQ XaaS, hardware signals and text files
- No clear ownership of or responsibility for data

New WbM will use data exclusively from database

- Data providers (subsystems, DCS, etc) become fully responsible for
  - Their database tables/views
  - Correctness of their data
  - Documentation
- WbM aggregation team and DB experts will help with the transition
- Focus on data relevant for CMS operations
  - Subsystem specific monitoring will no longer be done centrally
  - Any new service needs to be approved by run coordination

Instantaneous Lumi from BRIL

Old system

- BRIL writes data to DIP (interface to LHC)
- WbM pulls data from DIP
- WbM writes to database
- WbM displayed data from database
- WbM responsible to fix any wrong/missing data

New system

- BRIL writes data directly to database (using standard XDAQ tools)
- BRIL supports view (= stable interface to data)
- BRIL writes metadata (= describe the view)
- BRIL assures that the data is correct
- WbM pull data from view, displays, correlates, facilitates analysis with simple graphics and fitting tools

Auxiliary Services

Sysadmins

- Screen Snapshot Service (already exists)
- Online twiki replica

DAQ

- Run Time Logger (integrate with new expert system?)
- Non-event data injection into event stream (needs discussion/development)

DCS

- WBM HV Watchdog; Magnet History; Snappy elog viewer (partially exists)
- Last value; Condition Browser (evaluation ongoing)

EPR

- Shift Accounting Tool (to be discussed)

PPD

- Run Registry (already exists)

LHC Program Coordinators

- Filling schemes; Current bunches; Bunch fill Displays (already exists)

Need a New Name

Why a new name?

- Avoid confusion between new and old system
- Make clear that the new system has a reduced scope

A few names have been proposed

- CMS Online Monitoring System (CMS OMS)
- CMS Data Integration and Analytics (CMS DIA)
- CMS Data Integration Visualization and Analytics (CMS DIVA)
- Doodle vote ongoing at http://doodle.com/poll/vz8f8ud4xeimc83t
- If you have another proposal, send it to Andrea Petrucci

Goals & Timeline

Dec 2016

- Prototypes/milestones have been defined

Q1 2017

- Identify non-event data needed for 1st prototype
- Discuss with data providers (projects & coordination areas)

Apr 2017

- Evaluate 1st prototype, refine further plan

2018

- Start running new system in parallel with legacy

LS2

- Switch off old WbM system

Scope of 1st Prototype

Very limited scope

- Show building blocks work vertically
- Serve as base to define further development

Provides only a few pages for current data (end of 2016, first data of 2017)

- L1 summary including linked L1 rate plots (tables, dynamic plots, and links to related information)
  - https://cmswbm.web.cern.ch/cmswbm/cmsdb/servlet/L1Summary?RUN=285468
  - https://cmswbm.web.cern.ch/cmswbm/cmsdb/servlet/ChartL1TriggerRates?RUNID=285468&type=0&BITID=1&LSLENGTH=23.31040958&TRIGGER_NAME=L1_BptxPlus_NotBptxMinus&beforePrescale=1&rates=0&postDeadRatesHLT=0&debug=0&ratio=0
- Fill report (column summaries, links to other services)
  - https://cmswbm.web.cern.ch/cmswbm/cmsdb/servlet/FillReport
- Fill summary (static plots)
  - https://cmswbm.web.cern.ch/cmswbm/cmsdb/servlet/FillReport?FILL=5519

Summary

New online monitoring system will be developed

- Reduced scope wrt current WbM
- Focus on maintainability and clear responsibilities
- Improve user experience

Current WbM system must survive until LS2

- In maintenance/bug fix mode
- New features will not be implemented unless critical

Expect a gradual transition to the new system during 2018