Root – LHCb Online meeting

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Monitoring architecture (in pit)

ECS (PVSS)

- Configuration of software
- Starting, stopping

Insert Data into DB

Histogram Database (for display options)

- Which histograms to display
- Presentation details

Histogram producers

- L0
- Tell1 (CC-PC)
- EFF (HLT)
- Monitoring Farm

Histogram consumers and producers

- Histogram adders

Histogram consumers

- Histogram presenter

Histogram savers

ROOT

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ROOT

Histogram savers

- Root files on disk
- Histograme via DIM
- Meta data
- Histograme via DIM
Presenter requirements

- Tool to monitor the quality of the data
- Display histograms online (via DIM) and in history mode (from a Root file); build histograms over any time period
- 1D, 2D, profiles, trend plots
- Use a central Oracle DB to determine which histograms/pages to present, and how (display details, page structure, dynamic gui)
- Predefined pages for shift crew and experts
- Friendly graphical page editor (for grouping histograms and selecting display options)
- Trigger analysis actions (compare with reference versions, fitting, spike/hole finding, etc.)
Boundary conditions

- Part of LHCb online data quality monitoring project – presenter being designed by Peter Somogyi, Ph.D. student
- The presenter is a tool from the LHCb online group, integrated in the LHCb (online) environment
- Should work on Linux & Windows
- Distribute & release via CMT
- Uses Root, no requirement for running in a web browser
- Simple, reliable and maintainable over the lifetime of the experiment
Options

- **Root GUI** + **GDK**
  - Editor (GUIBuilder, different instance names after edit)
  - By hand (prototype II, problems)
  - Qt 3 (obsolete!, but used by PVSS)
  - Qt 4 (preferred)

- **Root + Qt**
  - XClass 95 (tree, editable combobox, slider missing in GUIBuilder)
  - GTK (Glade, needs ‘fresh’ GDK)
  - QtGSI (prototype I, problems)
  - Qt BNL (not available for windows on standard installation)
  - QtGSI (non existing)
  - QtBNL (under development)
Prototype I (Root + Qt3)
Problems/Questions

◆ **Choose this direction because of convenience for building platform independent GUIs**
  - PVSS 3.6 uses QT 3
◆ **QTGSI part of Root distribution since July 2006**
◆ **Root – QT integration problems**
  - Both use different event loops, synchronization problems
◆ **Same problems experienced by ATLAS -> modified QTGSI**
  - Attempt to fix synchronization
◆ **Distribution problems**
  - CMT on Windows doesn’t support make fragments for QT applications
Problems/Questions

- Pure Root – like ALICE (requirements much like LHCb with MySQL for DB and DIM for communication)
- Creating GUIs with Root difficult – are there plans for a more developer friendly GUI editor?
- Unexpected behaviour of X11 based Root GUI widgets
  - Widget coordinates hardwired
  - Multiple selections awkward
  - Problems with editable dropdown combobox, reported in Savannah
- What do the Root team recommend for building GUIs on the longer term?