DESY ATLAS Group Meeting
25th August 2006

Recent developments in Trigger Configuration

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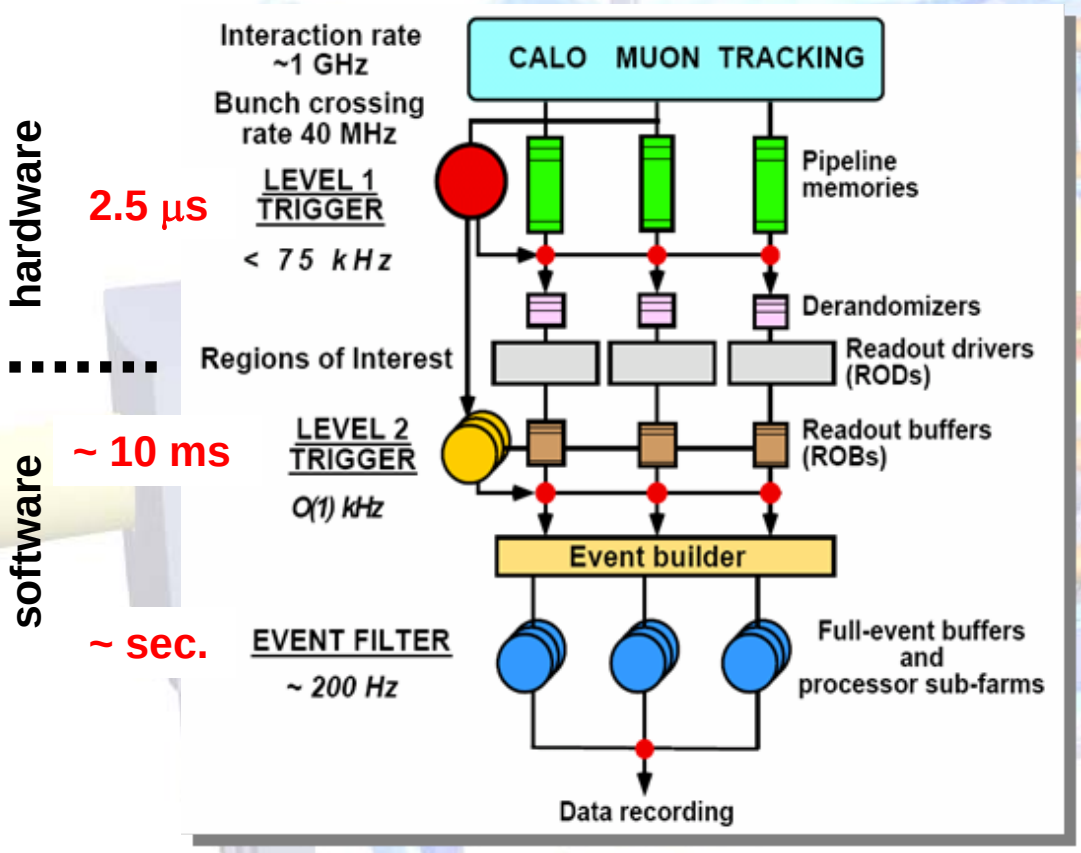
Reminder: The ATLAS Trigger System

ATLAS 3-Level Trigger System:



1) **LVL1** decision based on data from calorimeters and muon trigger chambers; synchronous at 40 MHz; bunch crossing identification

2) **LVL2** uses Regions of Interest (identified by LVL1) data (ca. 2%) with full granularity from all detectors

3) **Event Filter** has access to full event and can perform more refined event reconstruction

Selection in various levels strongly coupled→ need common configuration system (consistency) storing all info to describe the selection

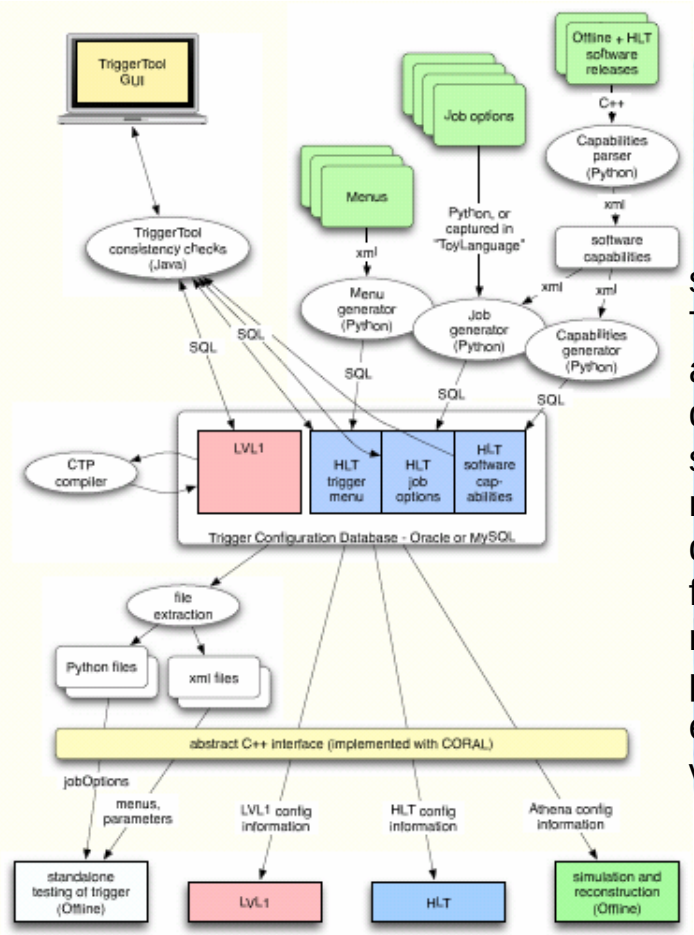
Overview of the Configuration System

Tools for Data input/ DB population: GUI, compilers, scripts,…

Data Storage: TriggerDB, relational DB (ORACLE, MySQL), content and data structure very important…

Data Access: C++, direct, XML

Clients: LVL1, HLT, online, offline

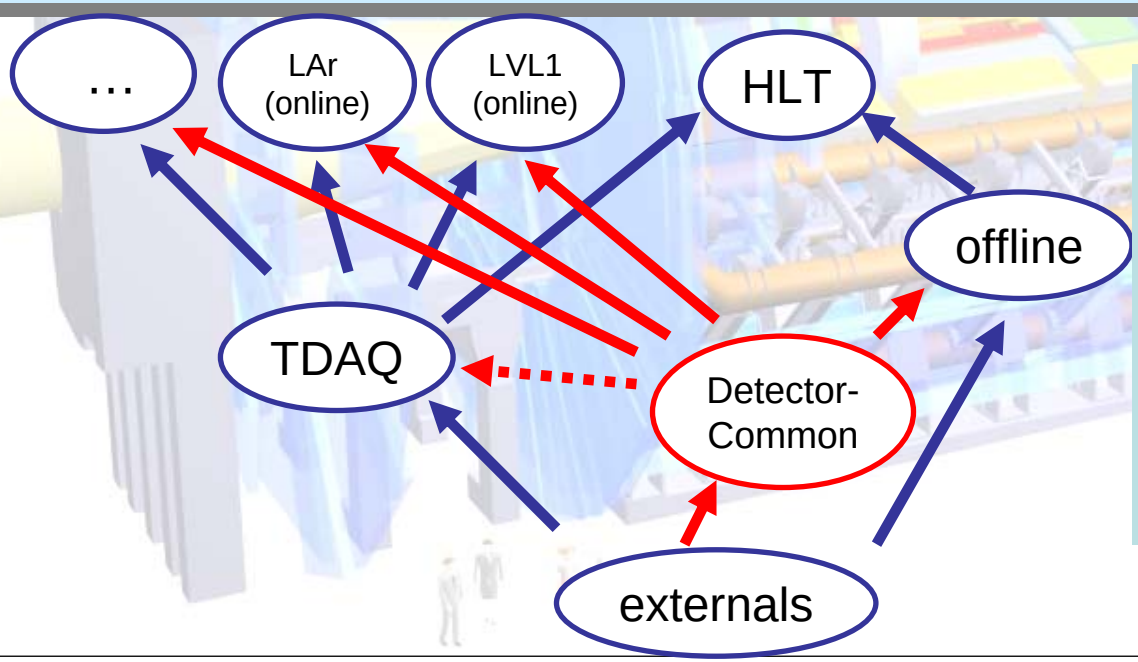


schema of TriggerDB, holding all information to describe the selection (e.g. HW registers for L1, definition of chains for HLT, random rates, algorithms parameters, everything, versioning , …)

development in all areas ongoing, many people (CERN, DESY)
this talk: only few highlights and interesting developments

New: software organization

- ATLAS Software is (was) organized in two strictly separated areas: online (TDAQ) and offline (ATHENA, …)
- problem: TrigConfig software must be used online (for running) and offline (for simulation).
- expected that there are more sub-detectors that have such software (TrigConfig is the “avant-garde”.)
- new area: DetCommon.



- TrigConf SW is part of DetCommon
- code located in CVS /atlas/offline/Trigger/TrigConfiguration repo
- first release of DetCommon built and available at pit

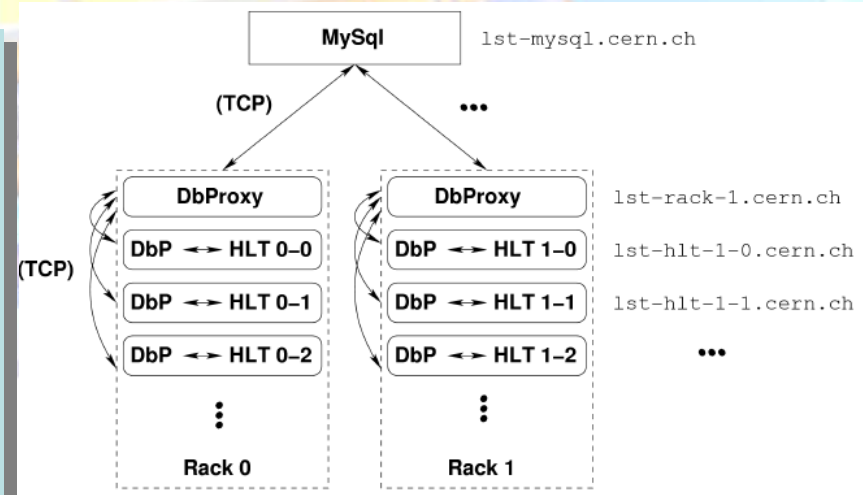
Integration with clients

LVL1 :

- Central Trigger and the interface between muon trigger and CTP are using the configuration system in the pit since ~June, no archiving yet
- Calorimeter Trigger is (partly) integrated, preference to run standalone for now.
- Muon Trigger integration ongoing
- simulation: see Wolfgang's talk

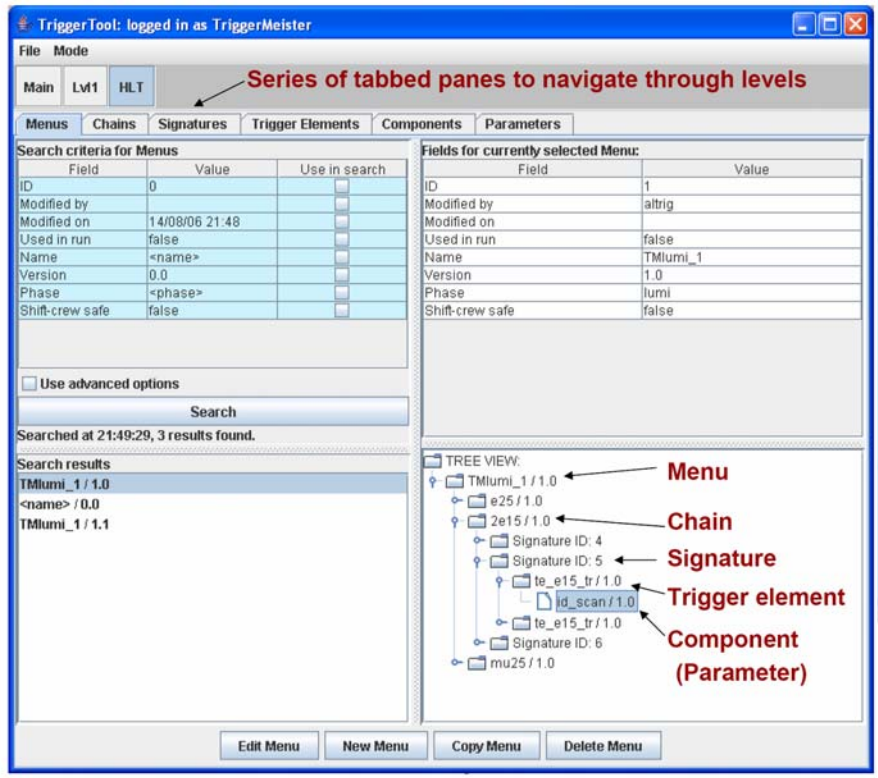
HLT:

- Steering+Algorithms integrated, (partly) in official release
- thorough testing of performance foreseen for LST (November)
- custom made DBproxy from SLAC to be used



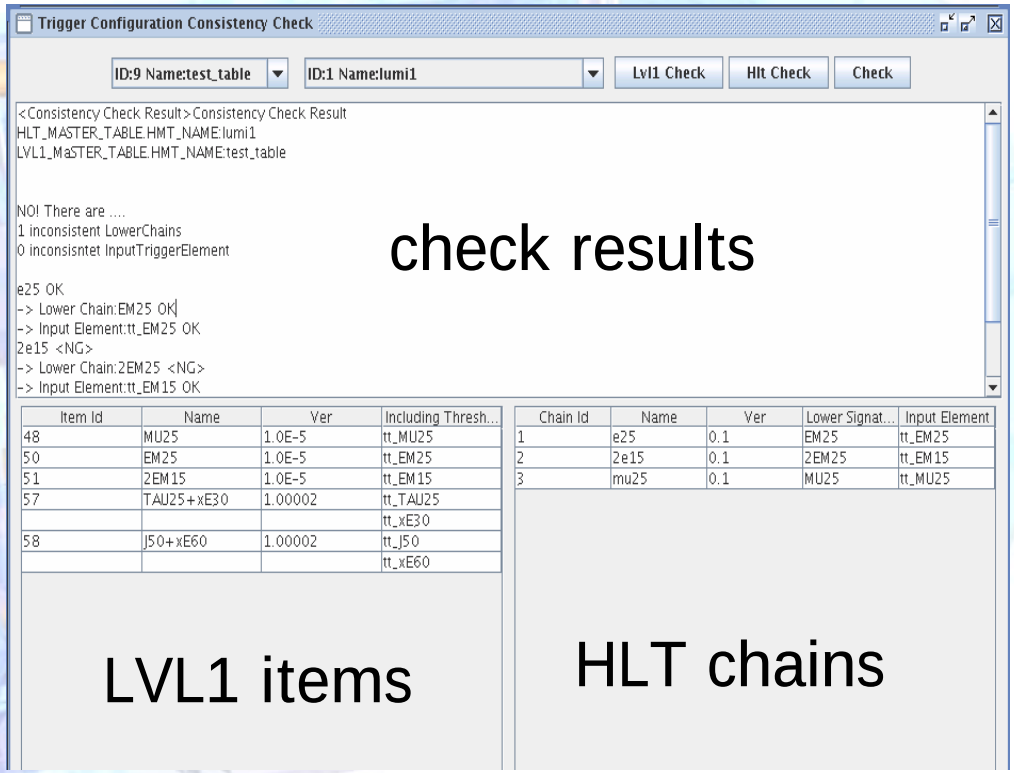
New : HLT part of TriggerTool

- TriggerTool is a JAVA front-end for the TriggerDB.
- allows browsing and modifing the TriggerDB in an easy way.
- Several modes: users, expert, shift.
- So far only LVL1 functionality existed.
- Now: HLT part developed:
  - uploading of full configurations from XML files (produced by ATHENA).
  - browsing of HLT configurations
  - easy modification of DB entries



New: consistency checker

- Trigger menu is a big and complicated object with a lot of dependencies.
- Trigger menus must be checked for consistency:
  - LVL1 internal,
  - HLT internal, (L2/EF)
  - LVL1/HLT interface
- tool developed in JAVA
- runs standalone or in TriggerTool



Review

- An ATLAS internal review of the TrigConfig System was foreseen as one the LHCC milestones.
- The start of this review is now scheduled for mid September (TDAQ week in London)
- Review document expected ~4 weeks later
- more information:

https://uimon.cern.ch/twiki/bin/view/Atlas/TriggerConfigurationReview

Review team composed of:

- people with trigger experience from running experiments
- ATLAS experts from LVL1, HLT, DAQ, DB

Reviewers:

- Mike Medinnis (chair),
- R. Bartoldus,
- R. Hawkings,
- M. Abolins,
- R. Spiwoks,
- B. Gorini,
- S. George

ex-officio:

- N. Ellis,
- C. Bee,
- L. Mapelli

Summary

- Basic building plots of TrigConfig system exist.
- Most important: Data structure defined and stable, schema of TriggerDB, holding all information to describe the selection (e.g. HW registers for L1, definition of chains for HLT, random rates, algorithms parameters, everything, versioning , …)
- Current work concerns mainly SW development around the TriggerDB
- Transition towards production system
- Review foreseen for mid September