ATLAS-DESY Meeting,
Zeuthen
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Trigger Configuration

Universität Hamburg

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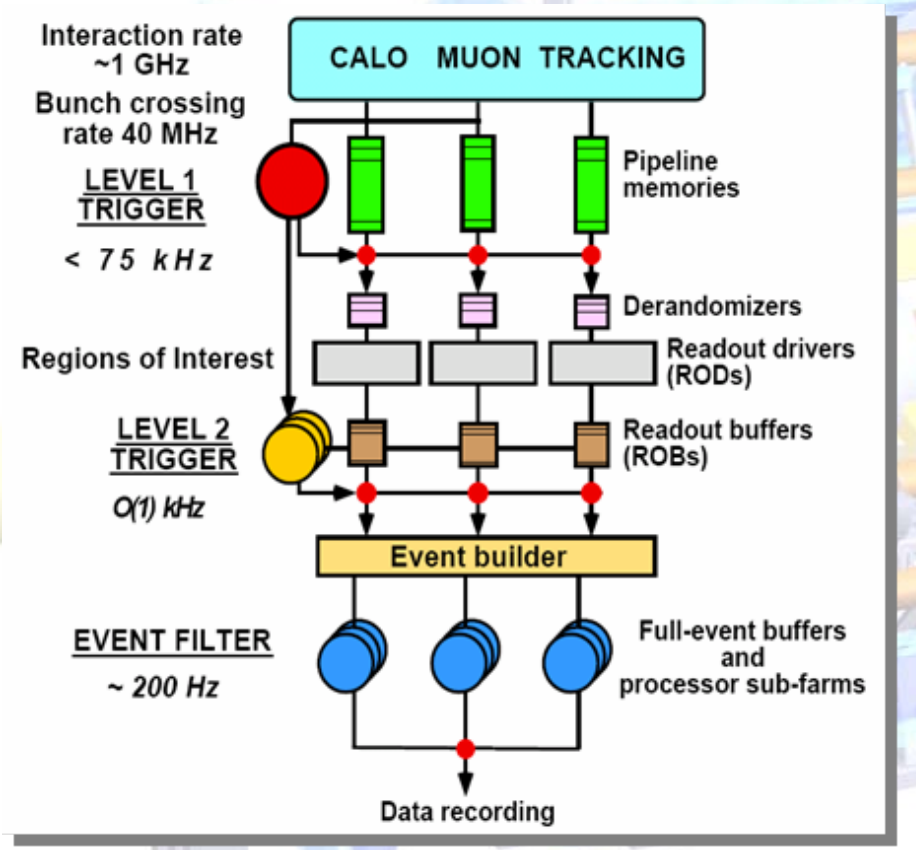
Reminder: the ATLAS trigger



Configuration:

LVL1 HW

VME modules of

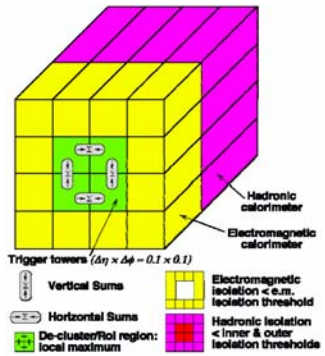
- L1Muon(RPC+TGC)
- L1 Calo
- Central Trigger

~ 3000 HLT nodes

Lvl2 and EF

Reminder: online event selection

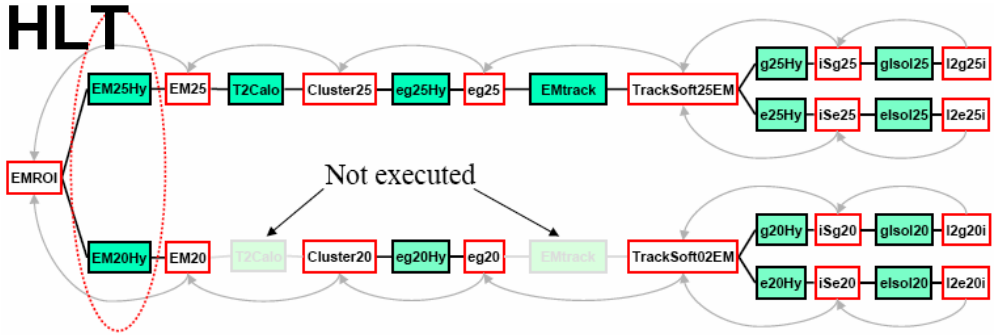
LVL1



L1Calo: RoIs

CTP: decision

HLT



algorithms (refinement of Trigger-elements/ RoI)

Steering (stepwise calling of algorithms, stepwise decisions, early reject)

Configuration:

LVL1 menu

clients:
L1 subsystems + CTP

HLT JobOptions

algorithms

HLT menu

Steering

Consistency!

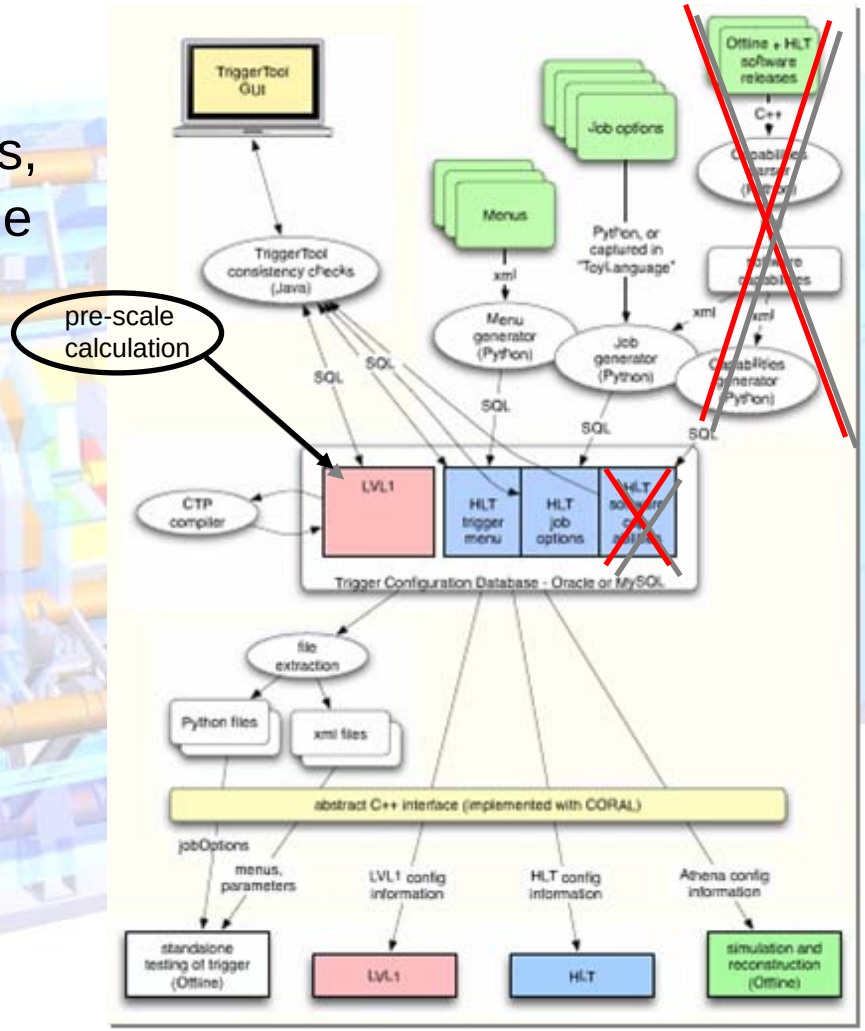
Reminder: the foreseen system

Tools for Data input/ DB population: GUI, compilers, scripts, validation tools, pre-scale calculation…

Data Storage: TriggerDB, relational DB (ORACLE, MySQL),…

Data Access: direct (via DB proxy) or local files (XML JO)

Clients: LVL1, HLT, offline

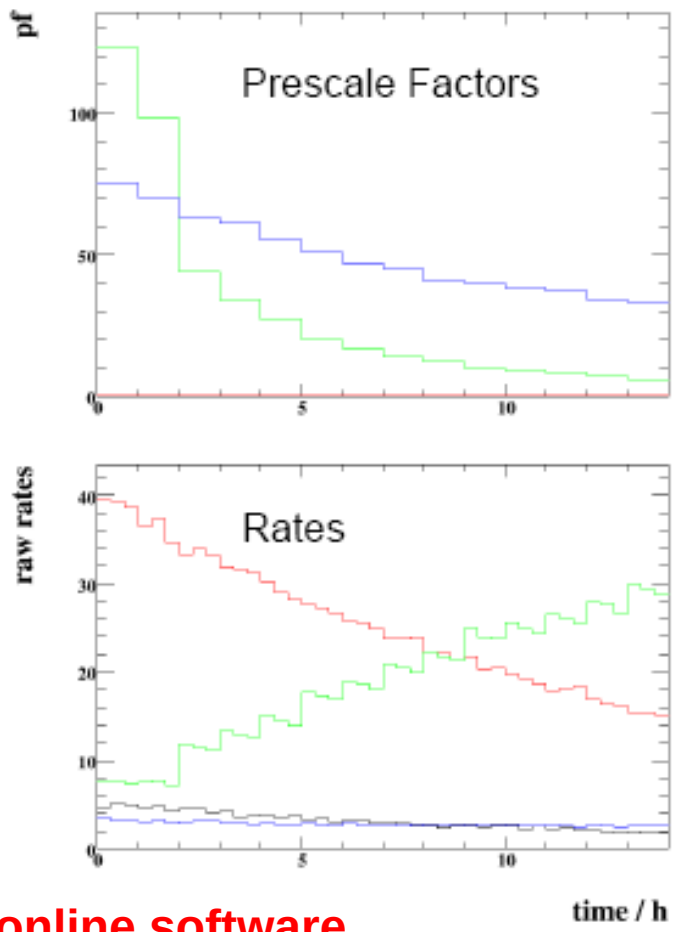


Highlights from recent developments

Dynamic Level 1 Prescale

Sebastian Schmitt– Summerstudent
DESY / Johannes Haller

- Adjustment to decreasing luminosity, different background conditions to always use full bandwidth → studied dynamic prescale algorithm from H1
- Strategies on splitting available bandwidth between different triggers
  - **Physics** (sacred, prescale=1), **calibration** (required rate), **other physics** (remaining bandwidth, weight)
- Tool calculates prescales for next run and updates TriggerDB (transition at lumiblock should be possible)
- Modus operandi to be decided



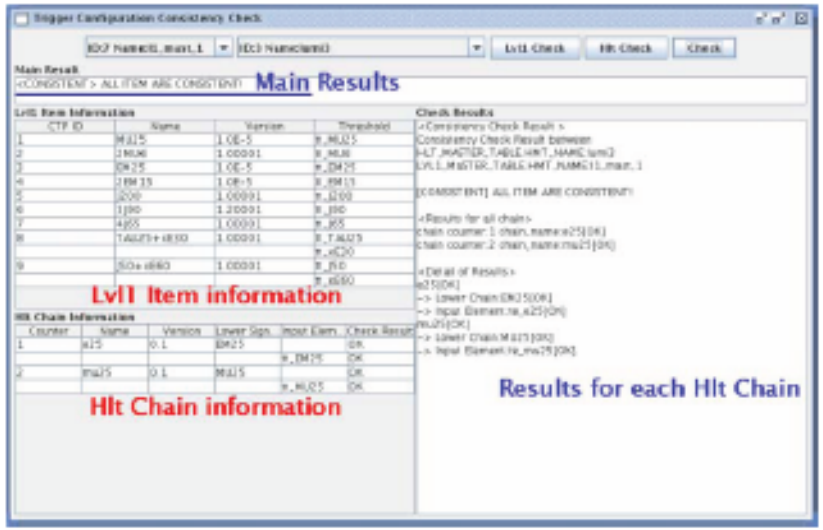
Next steps: integration into LVL1 online software

Highlights of recent developments

LVL1 – LVL2 Consistency Check

Yasuyuki Okumura – Summer-student / Takanori Kono

- LVL1 and HLT currently rather independent (schema, uploading procedure)
- Tool to check agreement between LVL1 Trigger Items and LVL2 Input
  - works on Database or xml files (check before upload)
- Currently being implemented into TriggerTool



Highlights from recent developments

Level 1 Configuration (Hardware) from the Database

David Berge

- Configuration of CTP
  - 1st step (LVL1 expert):
    - Set deadtimes, prescales, thresholds etc.
    - From (human-readable) LVL1 Menu, TriggerMenuCompiler(C++ tool / Ralf Spiwoks) creates data for configuring CTP LUT (Lookup Tables) and CAM (Content Addressable Memories)
    - TMC Interface now part of TriggerTool
  - Data taking: LVL1 central trigger software at Point 1 able to read 'image' from DB and configure CTP_CORE before data taking starts

Highlights from recent developments

Status LVL1 central-trigger configuration

- Configuration of CTP and MuCTPi boards from DB integrated at P1
  - Initial performance tests satisfactory
- TriggerMenuCompiler interfaced from of TriggerTools
  - Need to increase flexibility for commissioning phase
- L1Calo, L1Muon configuration under development
  - Database can hold the configuration, L1Calo access methods available

The review

- Reviewers: Mike Medinnis (chair), Maris Abolins, Rainer Bartoldus, Chris Bee, Nick Ellis, Simon George, Benedetto Gorini, Richard Hawkings, Ralf Spiwoks
- Provided lots of documentation:
  - Dual purpose: Configuration Encyclopedia
  - https://twiki.cern.ch/twiki/bin/view/Atlas/TrigConfDocu
- Kick- off meeting during TDAQ week
- 2 review sessions done already:
  - Last Wednesday: General design, operational model
  - Yesterday: TriggerDB
  - Good, constructive discussions, very helpful
- 2 or 3 more sessions scheduled for the next 2/3 weeks:
  - TriggerTool
  - Uploading, downloading
  - AOB
- Aim: review document with recommendations, concerns, prepared by reviewers

Next steps

- Next important steps:
  - Finish review and react to results
  - Large Scale Tests

- To be done:
  - Conditions part of the problem, related: analysis model
  - Implementation of configuration of streaming
  - DB replication
  - Schema evolution
  - LVL1 prescale setting and book-keeping.
  - …
  - Move to production system