Next Goals for Online Computing
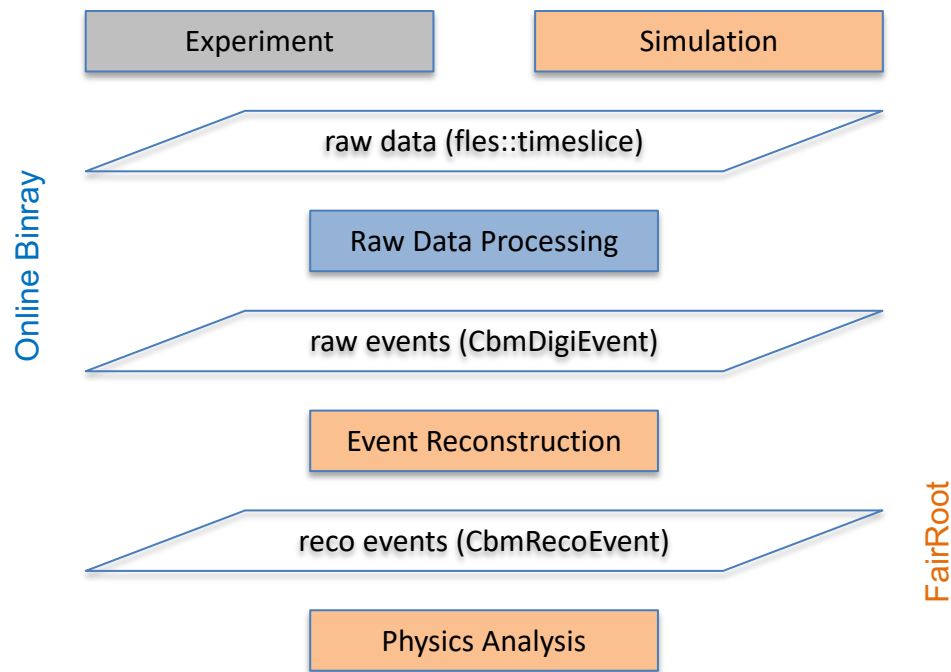
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CBM Online Computing Meeting, 13 November 2025

Day-1 : Minimal online computing

Online Binray

Experiment

Simulation

raw data (fles::timeslice)

Raw Data Processing

raw events (CbmDigiEvent)

Event Reconstruction

reco events (CbmRecoEvent)

Physics Analysis

FairRoot

Day-1: No reconstruction in timeslice processing (simple trigger and event selector)

Minimal online data processing

Tested in VT 25 (w/o unpackers)

Beyond Day-1

- VT 25 will tell us something on the resources we will need for day-1.

- We want to come to high-rate operation soon after day-1.

- We are asked how many resources we require and in particular whether we require GPUs for online data processing.

- To answer that, we should consider the other extreme: maximal event rate, complicated trigger topology, online reconstruction and analysis down to trigger level.

Day-X: maximal online computing
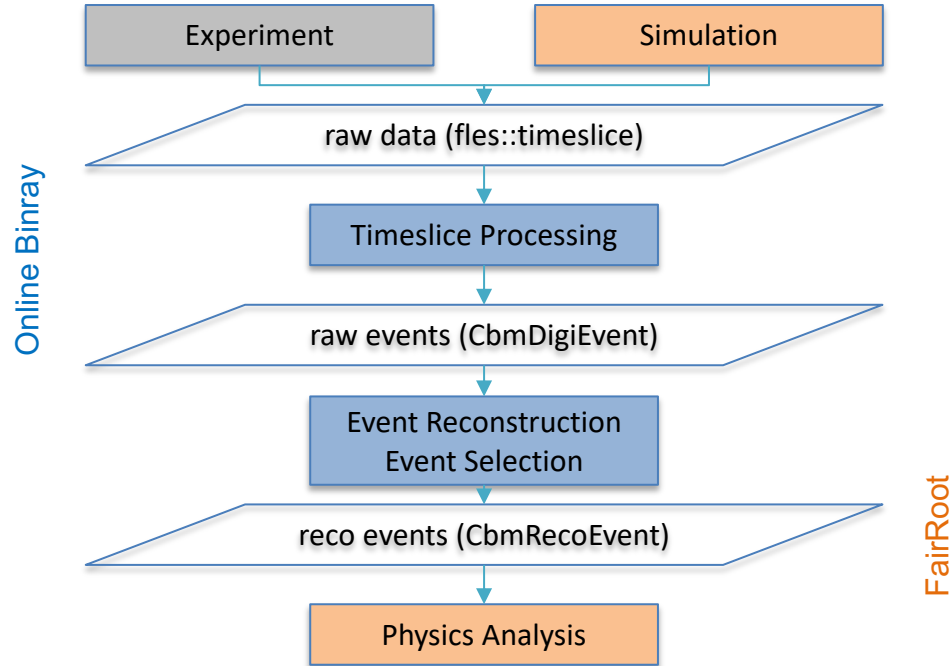
Day-X: Advanced trigger with (partial) streaming reconstruction; event selection based on decay topology.

What we need (online)

Step	Where	Status
Unpacking	CPU	Available, to be optimised; not included for simulated data
Time-based STS reco	CPU / GPU	Available
Time-based track reco (STS only)	CPU / GPU	Available (CPU), in work (GPU, G. Kozlov)
Trigger: track cluster	CPU	Available
Event builder	CPU	Available
Event reconstruction (parallel)	CPU	In work (S. Zharko)
Event analysis (KFPF) and selection	CPU	?

Remarks and Questions

- We are actually not so far away from the goal as far as algorithms are concerned.

- Potential to move to GPU: STS reco, track reco
    - More?
    - Is this sufficient to demonstrate our GPU needs?

- Can we balance trigger (on GPU) with event selector (on CPU)?

- Do we have the framework to implement this processing chain?

- Is it possible to use KFPF on STS-only tracks (i.e., in the trigger, not in the event selector)?