



Offline Reconstruction Framework and HLT

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08/12/2004

HLT Workshop

Offline - HLT Interplay

- HLT can use **simulated (raw) data** as **input**
- HLT **output** included in **ESD** for offline analysis

⇒ Close connection between
HLT and Offline

Common CVS Repository

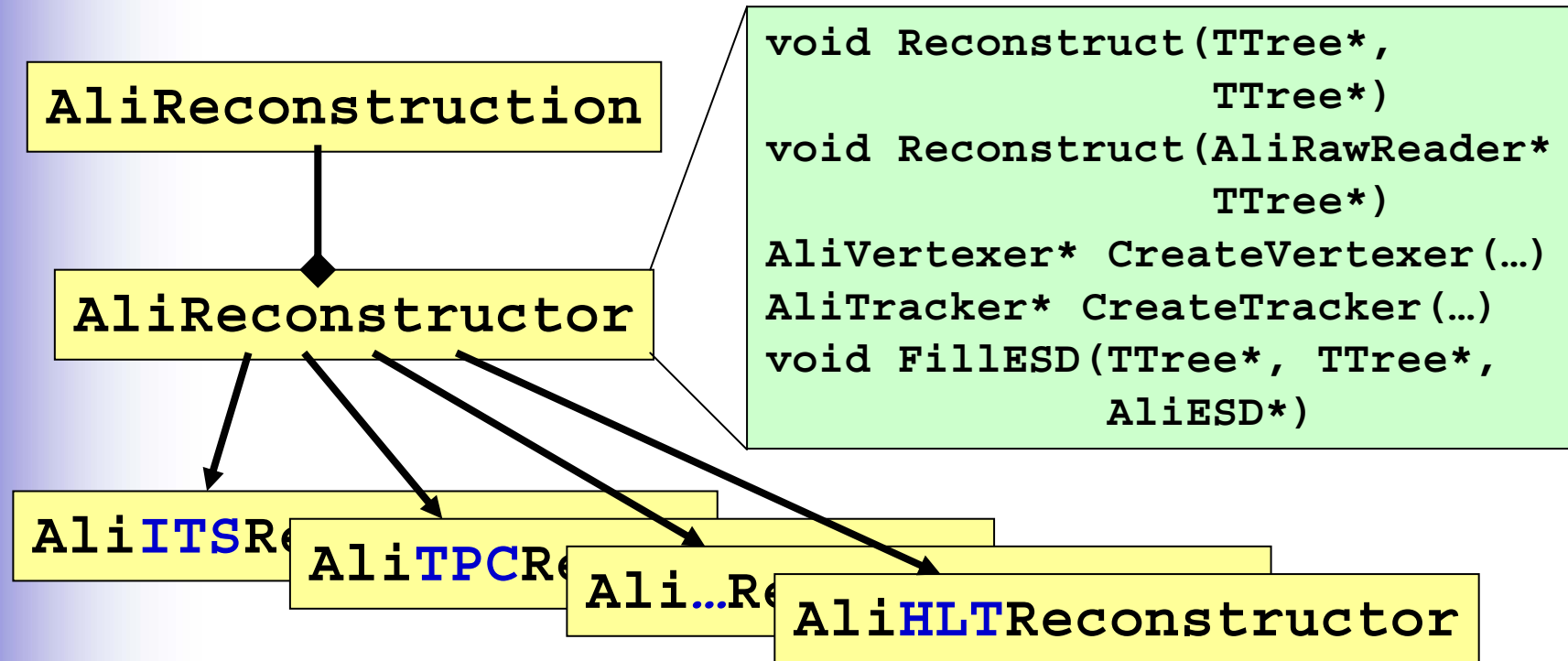
- ✓ Avoid divergences
- ✓ Fast feedback
- ✓ No version bookkeeping required
- ✓ Exchange of information and knowledge
- ✓ Sharing of code
- ✓ Reduced maintenance effort

Reconstruction Framework

Steering class **AliReconstruction**

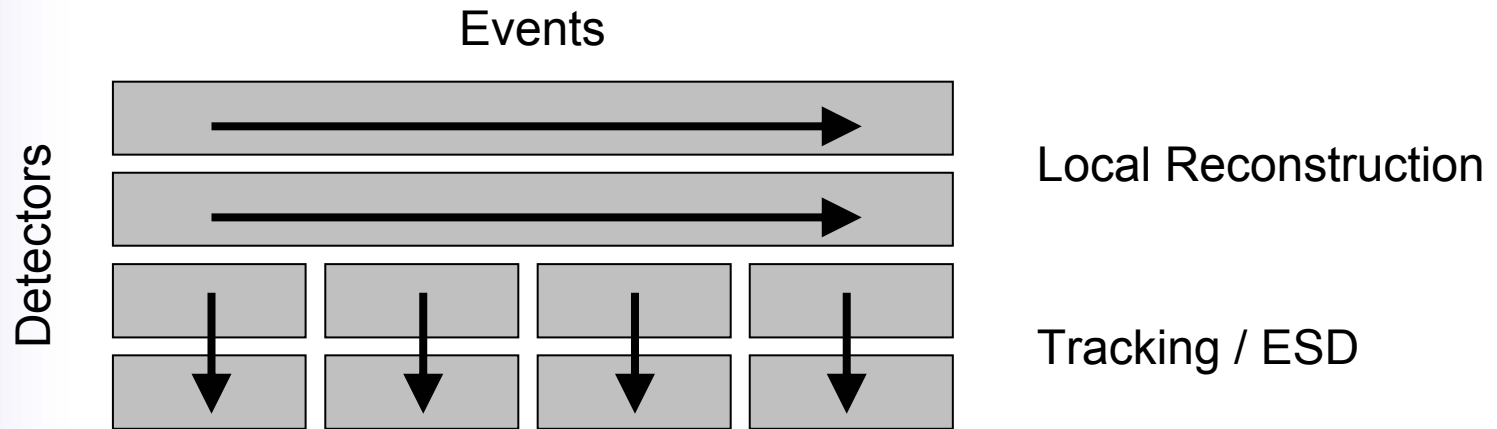
- Local reconstruction (clusterization)
- Primary vertex reconstruction (only ITS)
- Combined barrel tracking
 - TPC, ITS inwards
 - ITS, TPC, TRD, TOF, RICH, PHOS, EMCAL outwards
 - TRD, TPC, ITS refit inwards
- Filling of ESD (PID, V0s, ...)
- Interface to detector reconstruction code: **AliReconstructor** (+ **AliTracker**)
- <http://aliweb.cern.ch/people/tkuhr/ReconstructionFramework.html>

Reconstructors



- ⇒ Reconstructors for detectors can be **plugged in**
- Reconstructor for **HLT TPC** (conformal mapper + hough)

New AliReconstructor Methods



- Local reconstruction for all events of a run
`Reconstruct (AliRunLoader*)`
- Replaced by event wise local reconstruction
`Reconstruct (TTree* digitsTree,
TTree* clusterTree)`
- ✓ Selection of events possible
- ✓ No I/O, no event loop in detector code

Raw Data Input

- Raw data for (almost) all detectors simulated by offline framework
- Formats:
 - DDL files (DDL header + payload)
 - DATE file
 - Root file (TTree of `AliRawEvents`)
- Classes for reading (`AliRawReaderFile/Date/Root`) and for decoding (e.g. `AliTPCRawStream`) used by HLT and Offline

ESD Output

Event summary data (ESD):

- Output of the reconstruction
- Input for analysis

AliESD class:

- Combined barrel tracks (**AliESDtrack**)
- Primary vertex
- V0s, cascades
- Muon tracks
- ...
- HLT conf. map. + hough tracks (**AliESDHLTtrack**)

ESD Format

- TTree of AliESD objects

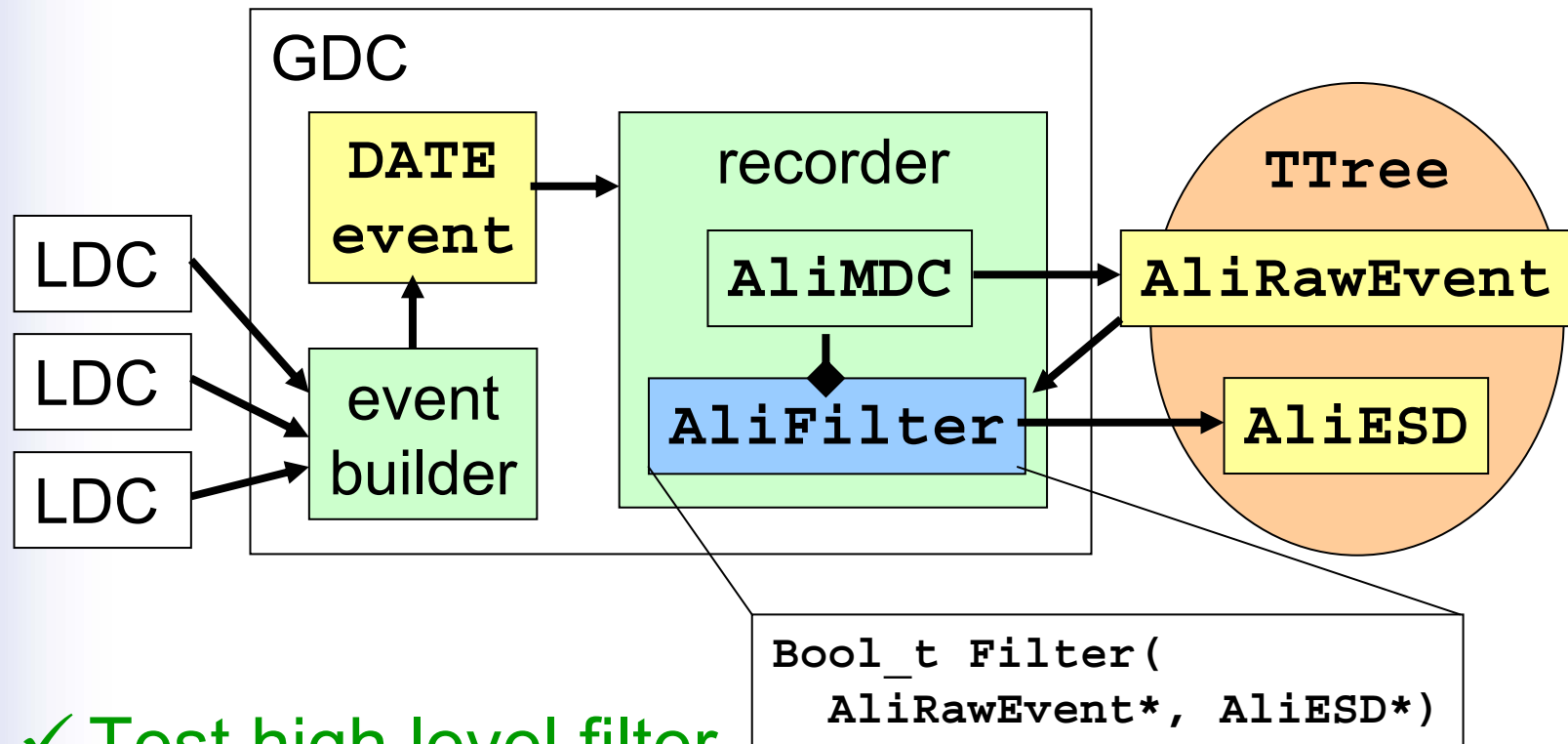
Possible new format:

- Same classes (AliESD, AliESDtrack) for HLT and Offline
- 2 parallel TTrees of AliESD objects
 - Easy comparison HLT/Offline
 - Same analysis code can be used
 - Extendible (e.g. HLT MUON tracks)
- Use Offline-ESD only for accepted events?

Physics Data Challenge

- ~20.000 Hijing events per centrality bin: cent1, per1, ..., per5
- Quenched and non-quenched jets in 12 energy bins merged with cent1 + per1
- Muons merged with cent1 + per1
- D⁰s (ongoing)
- Electrons (TRD) (ongoing)
- pp (ongoing)
- Analysis prototype: <http://aliweb.cern.ch/people/tkuhr/DistributedAnalysis.html>

Computing Data Challenge



- ✓ Test high level filter algorithms in online environment
- Implemented so far: **AliHoughFilter**
- ✓ When HLT output included in DATE event → replace filter by extraction of HLT-ESD

Summary

- HLT TPC integrated in offline reconstruction framework
- Other HLT detectors can be integrated easily via *AliReconstructor* interface
- Same output format (ESD) for HLT and Offline has many advantages
- HLT algorithms tested in data challenges
- HLT-Offline integration is progressed very well for TPC
- Other detectors to come