STAR reconstruction overview

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STAR Collaboration

Introduction

- STAR is similar to ALICE
  - Collider Environment
  - Barrel TPC as central tracker
  - Silicon based Vertex Detectors
    - STAR (SSD+SDD)
    - ALICE (+Pixel)
  - Common reconstruction tasks
    - Cluster/Hit/Track finders/fitters
    - Global combinators (tracks, PID, vertices)
    - Calibrations, Alignment, Controls

STAR Year-1 / Year-2

- Year-1 tracking detectors
  - TPC + one SVT plane (ladder) + FTPC
    - Simpler integrated tracking tasks
      - Material, trackers, matching, relative alignments
- Year-2, 2',2"... configuration
  - Initially + SVT, then +SDD
    - Harder integrated tracking tasks
    - Execution sequence less obvious
   - Detector<->Global handshake

Software design - Bad news

- Poor Initial Design
  - Legacy code was put together and effort concentrated in maintenance and algorithm development
    - New environment, new challenges
  - Minimum (STAR dedicated) manpower/frequent infra changes (much better now)

- Co-existence of Fortran/C++
  - makers and pams
    - Different code, same task
   - Black box/Don't touch approach

Good news

- Good algorithmic approaches to cluster/track finding
  - Based on previous experiments
- Basic tasks are covered even if not in an optimum way
  - No huge holes in the system
- Currently looking for common tasks
  - Propagation (GEANE …)
  - Fitting (Kalman …)
  - Algorithm handshake/streamlining/integration

- TPC (similar chart for SVT)
- All data are reported
in STAR coor. Syst.

TPC Simulations and Analysis Chain
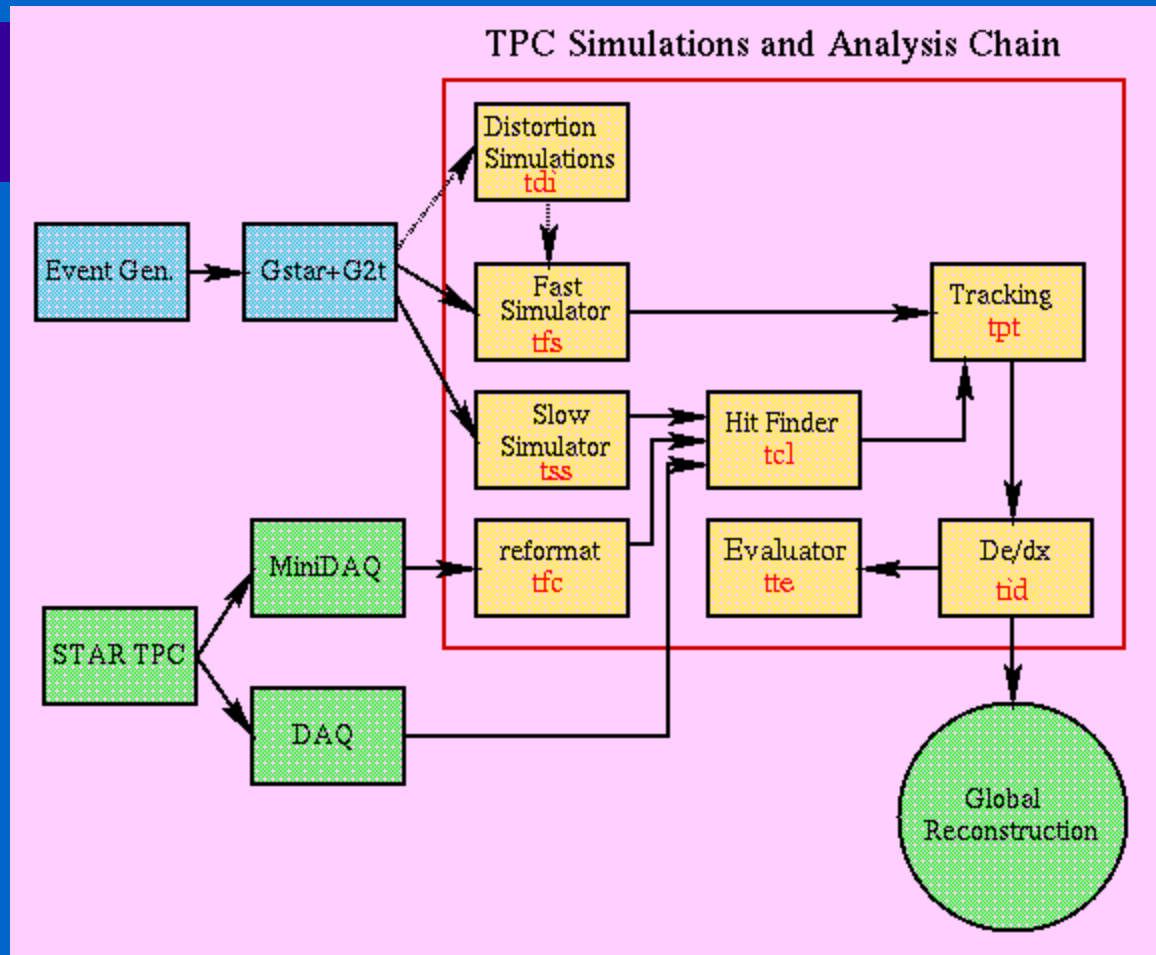
- : Global reconstruction
- Integrates detector specific info
- Writes DSTs
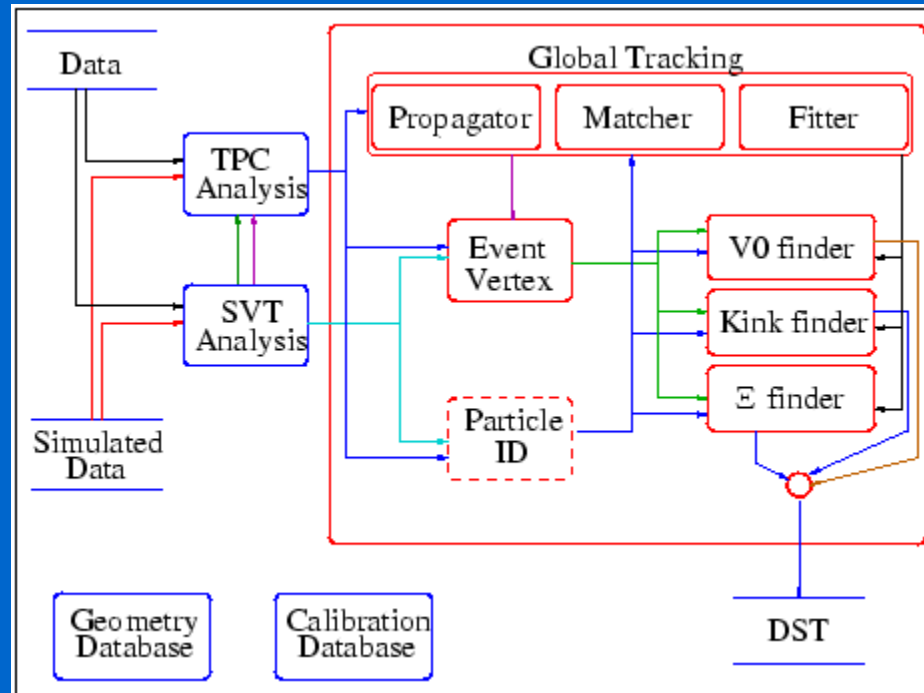
Plans

- Short term
  - Keep tuning / develop existing code
  - Profit from other's experience
  - Do the best we can for upcoming data
- Longer term
  - Get rid of legacy
  - Unify Analysis/Reco framework (StEvent ...)

Summary

- STAR will be ready to reconstruct its day-one data, but sweating

- Year-2 is more challenging than year-1

- There is hope for increased participation in developing/rewriting code as data/analysis needs appear.

- Need collaboration with outside experts