Status of the SPD software

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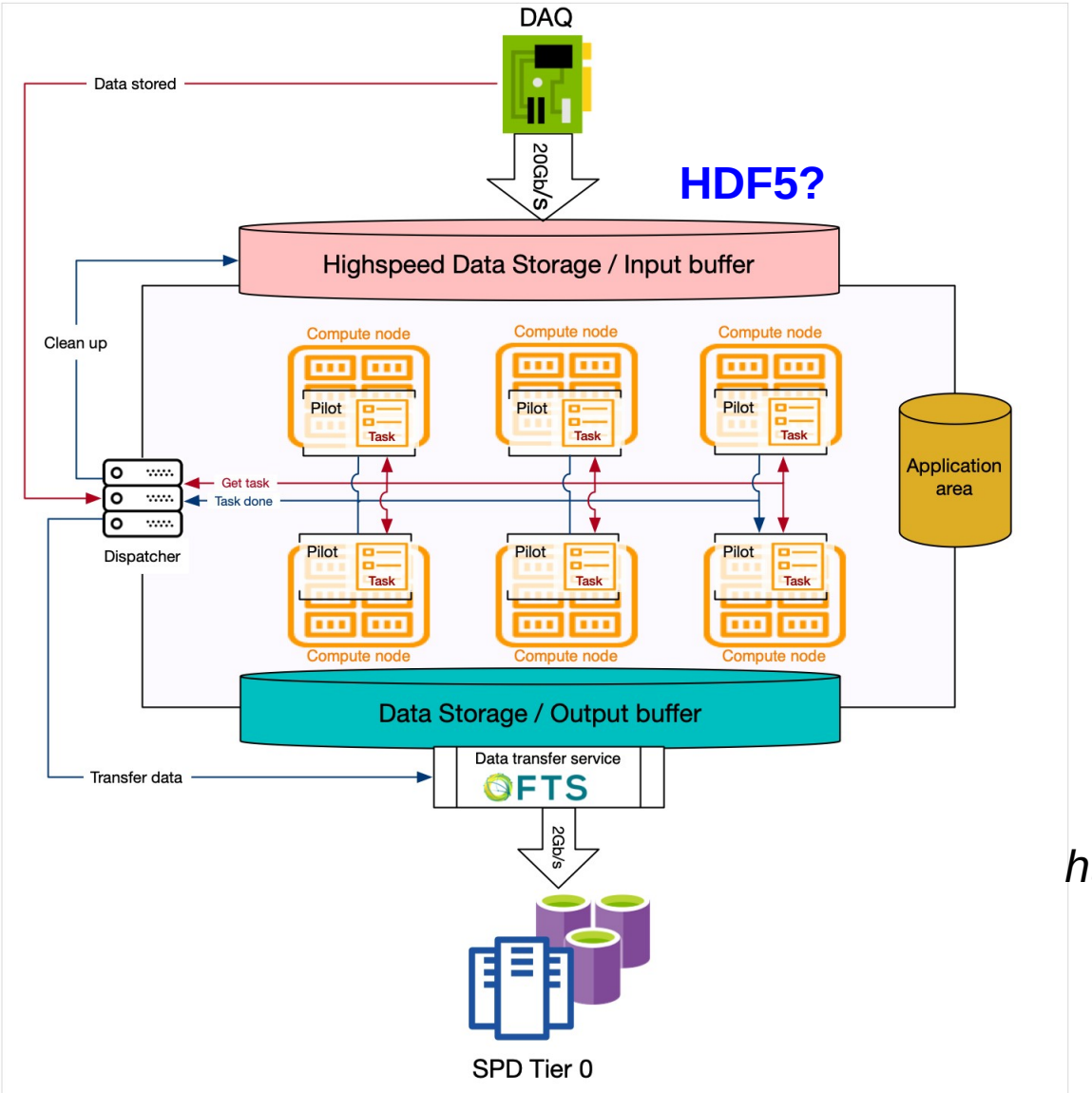
Online Event Filter

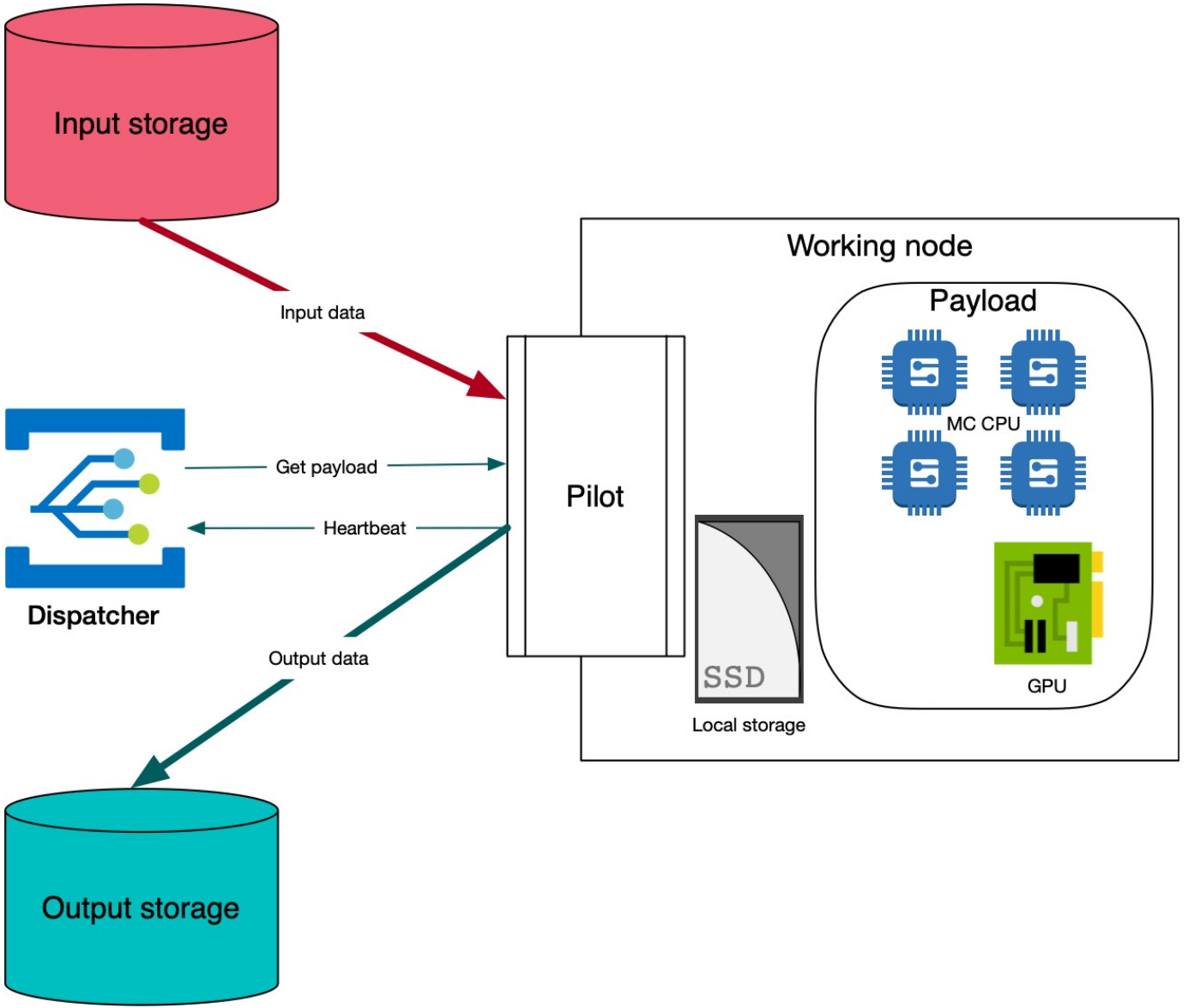
Online filter operation



https://git.jinr.ru/SPD_online_filter

Main ingredients

- **Input buffer:** 20 GB/s write, 20 GB/s read, delete 5 files/s
- **Output buffer:** 2x400 MB/s write, 2x400 MB/s read
- **Dispatcher**
- **Identical workers:** multicore nodes with GPUs or FPGA co-processors. 1000 or 5000 WNs ?— depends on the performance of our algorithms!
- *We should foresee using these computing resources for offline data processing between the data taking campaigns*

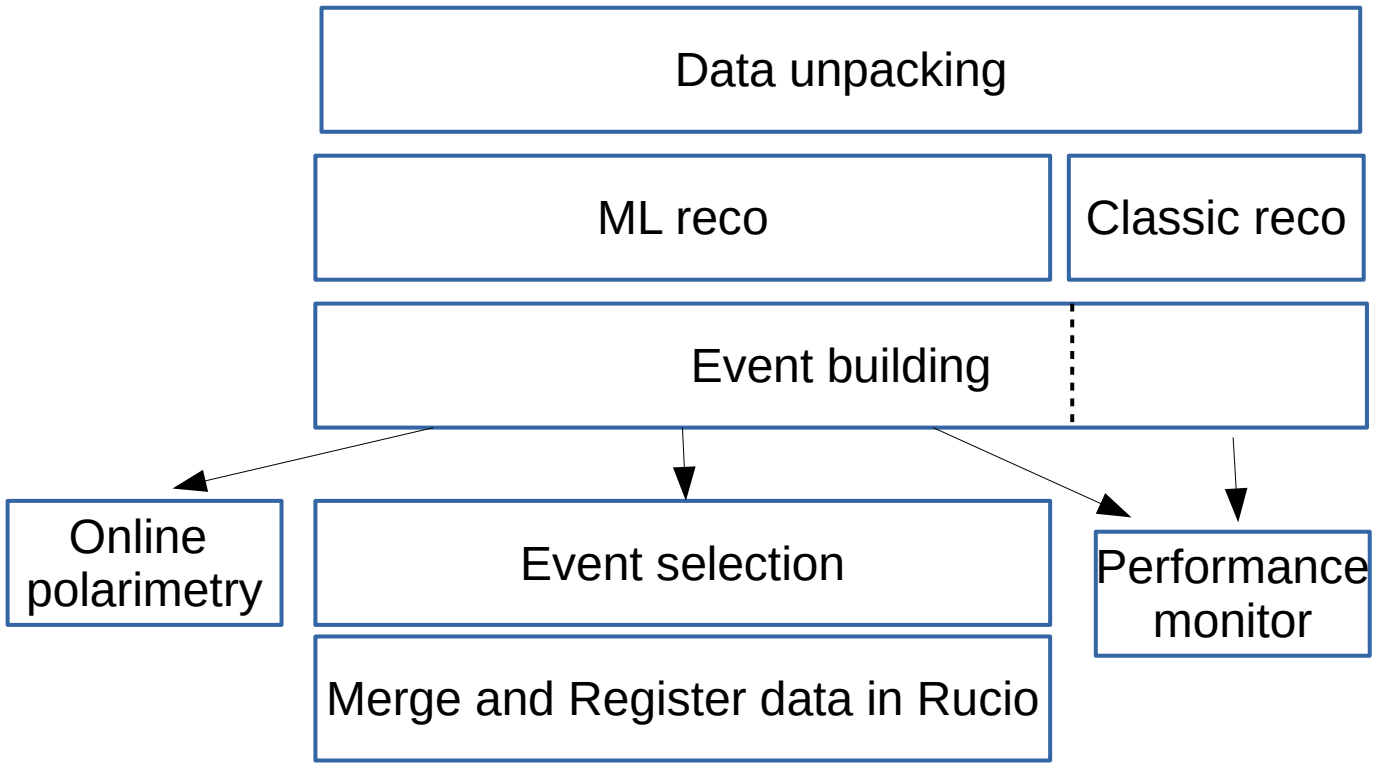

Input storage
Input data
Working node
Payload
MC CPU
Get payload
Heartbeat
Pilot
Dispatcher
Output data
SSD
Local storage
GPU
Output storage

The pilot

- Constantly runs at a WN
- Communicates with the dispatcher
- Copies data from the input buffer to the WN
- Calls the reconstruction software (ML, classic, merging — depends on the dispatcher’s instruction)
- Copies the resulting file to the output buffer

The payload

Very simple prototype
of the framework exists already



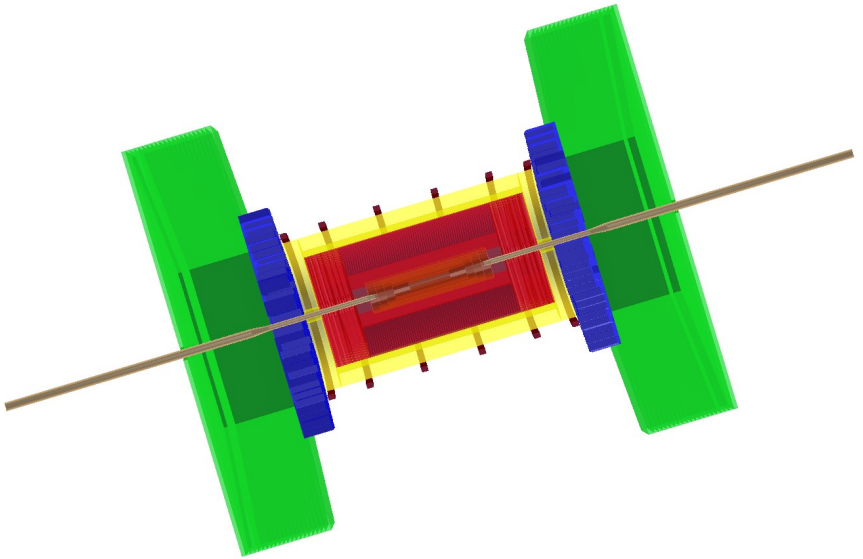
Urgent issues for the TDR (online filter)

- Simulation of a continuous data stream
- Event unscrambling procedure
- Event selection procedure and criteria
- Fast reconstruction algorithms and their performance

Offline software

An update of spdroot is released

- Version 4.1.1 released yesterday
  - ECAL and RS MC-truth classes and algorithms
  - TOF added



Near future developments

- PLUTO event generator for the first stage simulations
  - *https://arxiv.org/pdf/0905.2568*
- SpdSoft
  - FairRoot + FairSoft + SPD external libs (GenFit, Eigen, KFParticle ...)
  - easy to build and to distibute in binaries
- Multithreading
- DIRAC as a lightweight computing system for user's simulations

Urgent issues for the TDR (offline)

- RS reconstruction
- Tracking speed
- Update of the detector geometry (magnet, vtx, straw tracker ...)
- Track finding
- Detailed detector response simulation

- Calib & Align & Database
- Computing system prototype
  - A skeleton exists already

Many thanks to Artur, Anna, Danila, Artem for their efforts during the summer time!