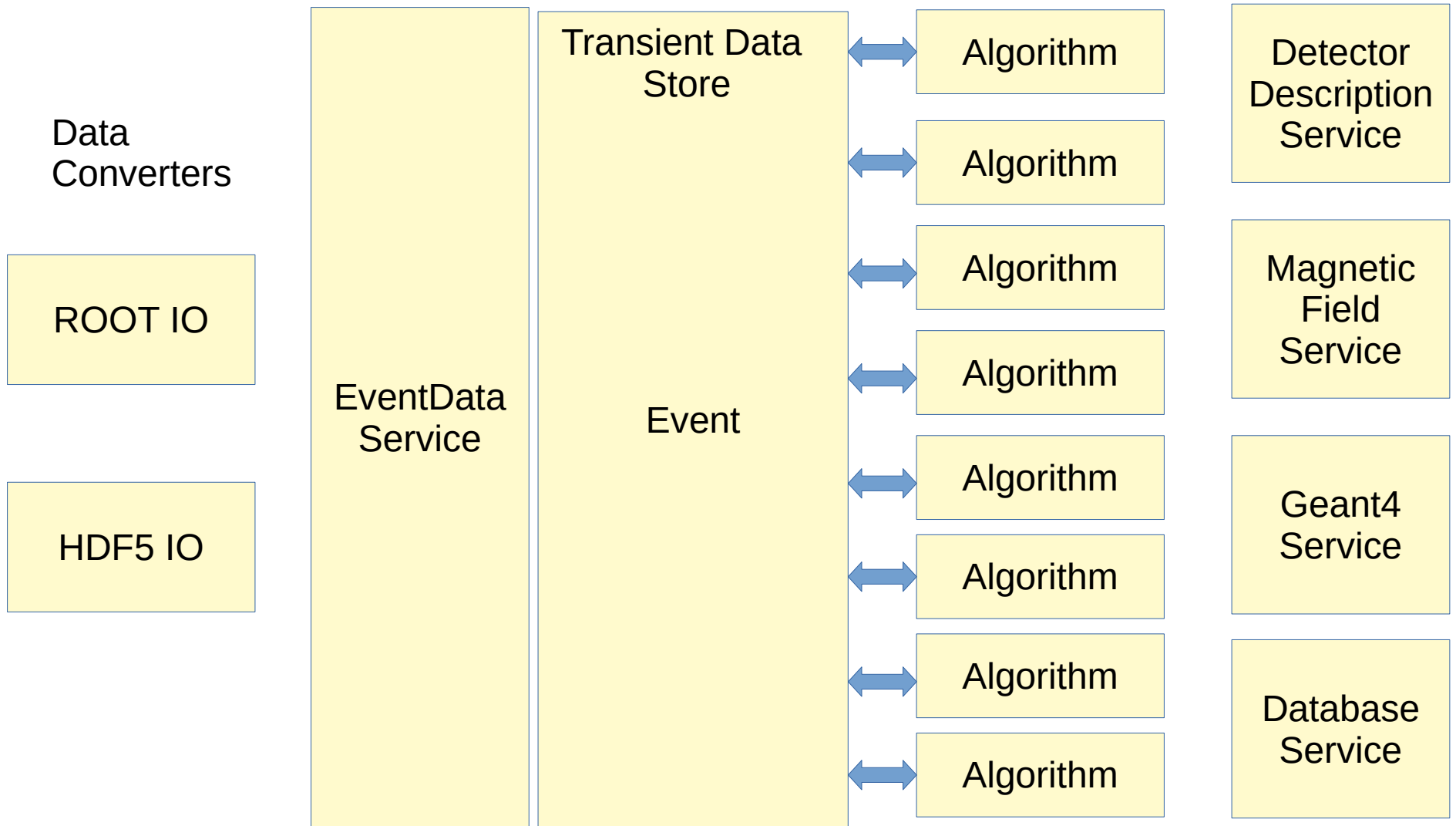


A new Gaudi-based framework

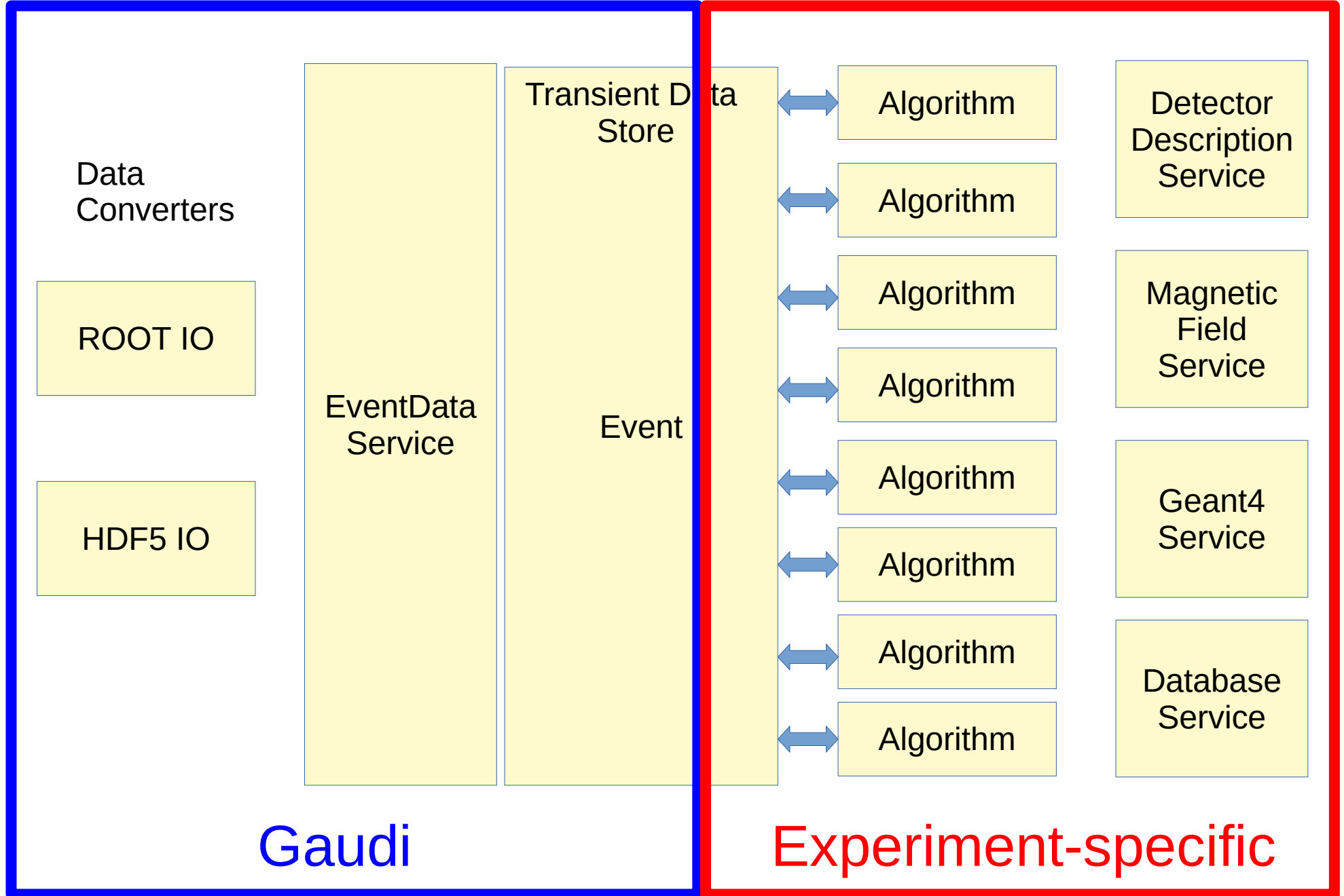
Alexey Zhemchugov
JINR

SPD Collaboration Meeting
26 April 2023

The Gaudi Framework



The Gaudi Framework



Algorithm

A class, inherited from a base Gaudi class, containing three functions:

- *StatusCode initialize()*

Algorithm initialization

- *StatusCode execute()*

Main data processing: read event data from TDS, process, put the result back to TDS

- *StatusCode finalize()*

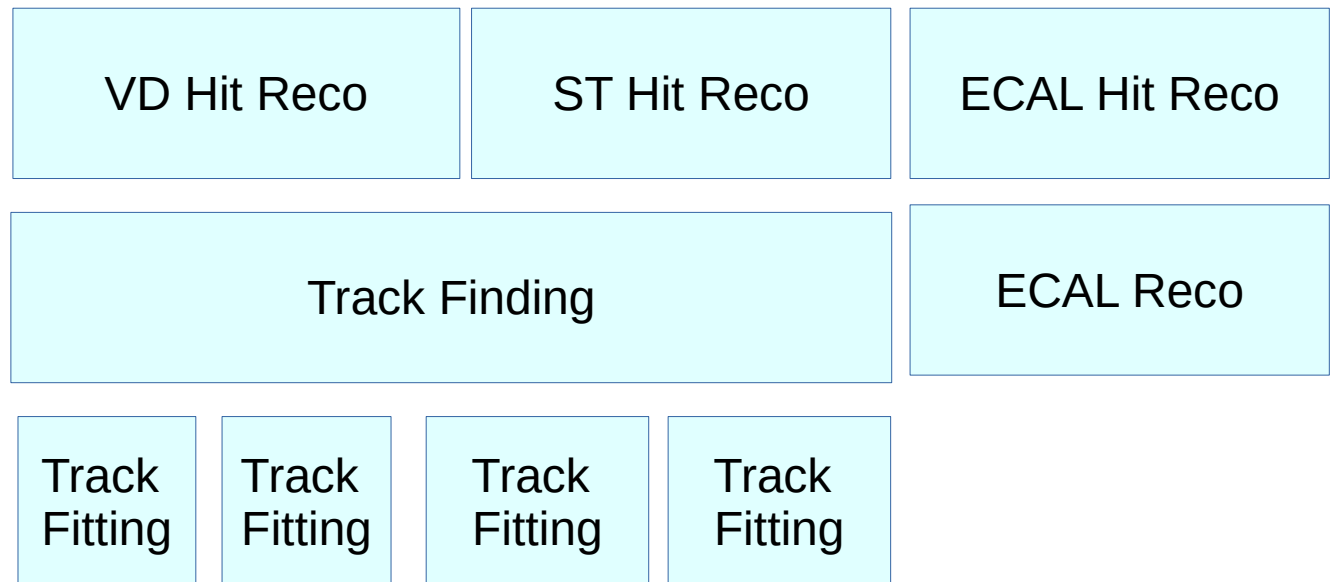
Final action

Access to TDS

```
SmartDataPtr<DataObject> evtRoot( eventSvc(), "/Event" );  
SmartDataPtr<Event>      evt( eventSvc(), "/Event/Header" );  
if ( evt ) {  
    int evt_num = evt->event();  
    SmartDataPtr<MyTrackVector> trkCont( eventSvc(),  
"/Event/MyTracks" );  
... process tracks ...
```

Later we likely will have to modify EventDataSvc to work with the EventIndex

Multithreaded execution



Single Application

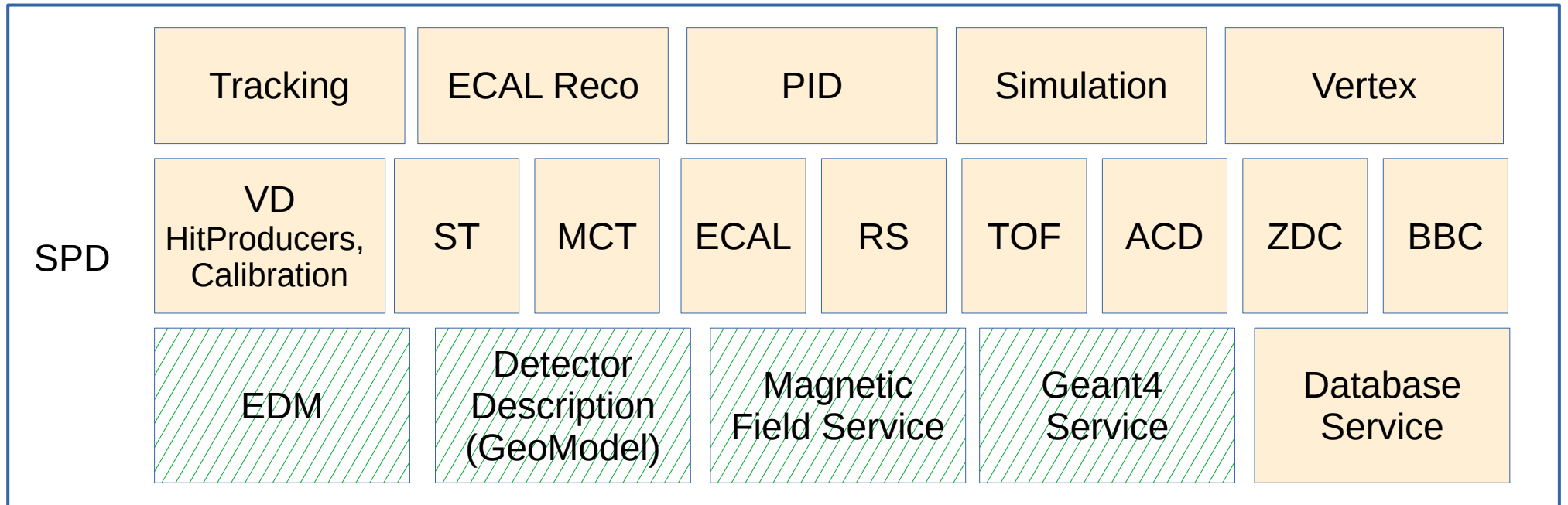
Gaudi.exe jobOptions.py

```
esel = EventSelector(OutputLevel=DEBUG, PrintFreq=50, FirstEvent=1)
esel.Input = [
    "DATAFILE='PFN:ROOTIO.dst' SVC='Gaudi::RootEvtSelector' OPT='READ'",
    "DATAFILE='PFN:ROOTIO.mdst' SVC='Gaudi::RootEvtSelector' OPT='READ'",
]
# Algorithms
evtAlgs = GaudiSequencer(
    "EventAlgs", Members=[SelectTracks(), CountSelectedTracks()]
)
# Application setup
app = ApplicationMgr()
app.ExtSvc = [EvtStoreSvc("EventDataSvc")]
EvtStoreSvc("EventDataSvc").InhibitedPathPrefixes = ["/Event/Header"]
EvtStoreSvc("EventDataSvc").FollowLinksToAncestors = True
# - Algorithms
app.TopAlg = [evtAlgs]
# - Events
app.EvtMax = -1
# - Algorithm properties ...
```

All algorithms, services and user's code used as shared libraries. No need to recompile the main application.

Packaging

User's code



Gaudi

External libs (18 for Gaudi + cmake/gcc/python + Geant4 + OTHER)

An alternative Gaudi-based framework

SpdRoot remains the main tool for the physics studies in the coming years. However, it requires significant developments before it can be used for the real data processing after SPD starts operation.

A new Gaudi-based framework is an alternative solution.

- **CentOS7, gcc-11.3.0, python-3.9.6**
- **Container with Gaudi installation is available**

docker pull jemtchou/gaudi

- **Working on FW components:**
 - Building system — V.Onuchin
 - Detector description — A.Allakhverdieva
 - G4Svc, Algorithm example — A.Zhemchugov
 - Magnetic field — NOSU group