

Task 12.2 - Turnkey Software

AIDAInnova, WP12 meeting

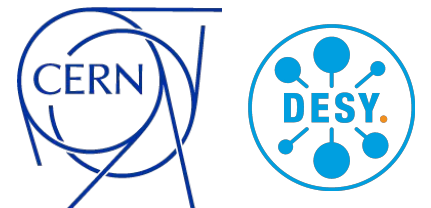
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HELMHOLTZ RESEARCH FOR
GRAND CHALLENGES



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Introduction

- Last WP12 meeting was in March (annual meeting)
- Hackathon in June got quite some work done in Key4hep
- The following slides are probably incomplete and suffer from some recency bias

podio developments

- **Basic version of Frame merged**
 - [documentation](#)
 - Framework/Gaudi integration yet to be done
- Schema evolution expected to be ready soon
- Implemented possibility to extend EDMs
 - Opens possibility for a **prototyping workflow for EDM4hep**
 - Also used by EIC at the moment for some additions. Plans to upstream this to EDM4hep
- Prototype of Julia bindings via GSoC project
 - [HSF blog post](#)
- Other smaller features and fixes
 - Init values in yaml, podio-dump tool, ...
- EIC decision to use Jana2 instead of Gaudi brings a few new challenges
 - Need to understand them (and how to address them)

Key4hep developments and progress

- Spack based CI workflow to build PRs from several different packages simultaneously
 - Using CERN gitlab instance and runners to launch configurable pipelines

Variable Input variable value

A whitespace-separated list of urls for github prs (for repositories for which there is a spack recipe). Example: `https://github.com/iLCSoft/SIO/pull/17/ https://github.com/AIDAsoft/podio/pull/287`

- Gaussino integration into Key4hep (Simulation approach consolidation)
 - Work on getting a build without LHCb components ongoing
 - Rather clear what needs to be done, but it is quite some work
- Ongoing discussion with EIC on how to best have “framework independent” algorithms
- Accommodating ACTS measurements in EDM4hep discussion started at hackathon
 - [Proposal for a general MeasurementND datatype](#)
 - First shot with only very basics (no conversion to/from ACTS yet, no geometry encoding)

Key4hep developments and progress (ctd.)

- Summerstudent projects @CERN & DESY
 - EDM4hep output for GUNIEA-PIG (CERN) [\[presentation\]](#)
 - Conversion DDPlanarDigiProcessor from Marlin to Gaudi (CERN) [\[presentation\]](#)
 - Evaluation of different analysis approaches with EDM4hep (DESY) [\[presentation\]](#) [\(restricted\)](#)
- Several smaller fixes and improvements
 - Random number handling in Gaudi (consistent seeding, seeding from options, using seed in MarlinWrapper)
- Placido left at the end of August
 - k4MarlinWrapper and EDM4hep <-> LCIO conversion

INFN work on heterogeneous resources

- Call for job opened in spring closed without candidates
 - Applicant accepted another position during process
- Currently working on reopening call
 - Expected to be open again soonish, but some things out of “our control”
- Tommaso and Giuseppe plan to dedicate some time to the project
 - No defined schedule yet

Updates from IHEP, Beijing

- Extending the event data model of TPC detector to accommodate the requirements from cluster counting of drift chamber
 - Meeting with the IDEA-CEPC drift chamber working group
 - Implementation details still being discussed within the EDM4hep group
- Heterogeneous computing test with EDM4hep
 - ACTS's seeding algorithm (SYCL version) has been studied and testing will be done using EDM4hep hits as its inputs.
- Effort to use a unified simulation framework
 - The possibility of using Gaussino as the underlying framework is being evaluated at CEPC

Progress @Shandong University, Qingdao

- Software validation for CEPC
 - Kubernetes-based CI runner is established and tested
 - Grid-based CI runner is being developed
- Test building Key4hep stack on arm64 architecture
 - Build is successful. Similar simulation results are obtained

Thank you