FCC Software status

Clement Helsens, Gerardo Ganis CERN-EP

Software workshop / tutorial

Logistics

- 2-3 October, CERN 593/R-010, Salle 11
- Web page: https://indico.cern.ch/event/839794/
- About 30 registrants

Structure

- Wed afternoon
  - Talks: overview, specific components
- Thur morning / afternoon
  - Hands-on

Goals of the workshop

- Make participants able to use what exists
- Make interested participants able to contribute to the evolution / development
- Make participant to provide feedback on
  - The format
  - The topics
  - Expectations

Software workshop / tutorial - Day 1

Current plans: Day 1

- Introductory talk (30') (*G Ganis*, *C Helsens*)
- Talks on specific components (status and plans)
  - Gaudi and FCCSW (*J Faltova*)
  - DD4hep in practice (*M Petric*)
  - Current detector 'palette' (V Volkl)
- Physics generators and availability for FCCSW (GG)
- KKMC/TAUOLA and BHLUMI outputs and FCCSW (S Jadach)
- Physics analysis framework (CH)

Software tutorials - Day 2

- 1) Running FCCSW Standalone
  - Generation+hadronisation with Pythia8
  - Detector simulation with Delphes
  - Produce plots

- 2) Physics analysis (ZH)
  - Use the events we will produce before the WS
  - Process them through the analysis framework for final cuts
  - Optimise selection of cuts or study a specific decay

Software tutorials - Day 2

- 3) Delphes card optimisation (use tutorial 1))
  - Full simulation of pi0 with LAr calorimeter
  - Delphes simulation of the same pi0
  - Optimise the Delphes parameters to reach the same performance

- 4) Tracking with Drift chamber
  - visualize and use the Driftchamber model in FCCSW
  - simulate the particle passage in Geant4
  - run digitization and get wire signal
  - run Hough Transform for a first track reconstruction
  - produce plots

Software workshop / tutorial: realised plan

- We had ~20 participants in the end (23 first day, 15 second day)
- People were from different experiments with very different SW experience
- In the end people were very happy about the different tutorials
- Remote connection did not work well, in particular for the hands-on
  - We will not support this any longer for hands-on
- The first day with presentations serves as a baseline
- Improve the workflow, use more the lxplus shell
  - Possibly using the Jupiter notebooks only as second example
- Overall was a very nice experience for both participants and organisers

General software news

- Many developments have been made on the software side and it is not worth summarising this here
- What exists is largely based on what has been used to prepare of the CDR
- Idea is to expand to more detailed studies, in particular for the e^+e^- machine
- Closely follows the ongoing R&D activities about a Common Software Stack (Key4HEP)

- But still on the critical path with personpower

- Next tutorial possibly before/during/after the FCC physics WS in January (to be planned)