

Update on Software Activities

LHCC Referee Meeting

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Outline

- Community White Paper Workshop
- Applications Area Program of Work

Community Whitepaper

Goal is to create a *Community White Paper (CWP)* on the overall strategy and roadmap for software and computing

- Paper to be delivered by summer 2017
- Including LHC upgrades and SW projects of Belle-II, ILC, neutrino program, etc.
- Related material collected [here](#)
- [“Kick-off” workshop](#) at UC San Diego on 23-26 Jan 2017
- Final workshop end of June ([evolving agenda](#))

CWP Kickoff Workshop (San Diego, Jan 23-26)

~110 participants, about 80 % US, 20 % european

- All LHC experiments well represented
- Participation from industry and computer science
- Wider HEP audience: physicists involved in trigger, reconstruction, machine learning...

[Agenda](#) consisted of

- One day of plenary presentations
- Panel discussions
- 2.5 of parallel WG meetings

Detailed [HSF newsletter](#) about the workshop



Plenary sessions

First day of **presentations** giving the context for working group discussions:

- Physics and Computing Challenges of the HL-LHC
- Situation for Linear Collider, LIGO, FNAL program, Chinese efforts
- Status of Cloud Technology
- Situation in (US) funding agencies
- Licenses and Citation for Software

Multiple **discussion panels** on

- Compute architectures, platforms and software performance
- Data centres and facilities technologies (clouds, networks, storage)
- Machine Learning in HEP

More details about plenaries in [HSF newsletter](#)

Working Groups active during workshop

- Detector Simulation
- Event Reconstruction and Triggering
- Visualization
- Data Access and Management
- Data Analytics and Machine Learning
- Event Processing Frameworks
- Workflow and Resource Management
- Data Analysis and Interpretation
- Data and Software Preservation
- Software Development, Deployment and Validation/Verification
- Role and Future of ROOT

All working groups defined their *scope*, *challenges*, main *questions* to answer and a *workplan*

Documents available via <http://hepsoftwarefoundation.org/cwp/cwp-working-groups.html>

What next?

- Kickoff workshop was very productive
 - Motivation by community clearly visible and groups started
- Final CWP meeting in June
 - Each working group has an ambitious work plan until then
- Various planning meetings co-located with some upcoming community events:
 - [Connecting the Dots](#) (Orsay, March 6-9)
 - [IML](#) (CERN, March 20-22)
 - HSF Analysis Workshop (Amsterdam, May 20-24/25)
 - [Data Science@HEP](#) (FNAL, May 8-12)

Simulation Project Plans

Status and Plans presented in January to experiments:

[Simulation POW 2017](#)

Geant 4

Main conclusions

- Detailed program of work
 - Extensions for physics models
 - Geometry optimization
 - Experiment support
- Collaboration between Geant4 and GeantV strengthening
- Alpha version of GeantV targeted for end of the year

ROOT Plans

Program of Work presented to experiments in January

[ROOT Plans for 2017 and Beyond](#)



Main development directions for 2017

- CLING and C++ modules
- I/O performance
- SIMD, MT and MP in Math and Statistical Libraries
- Machine Learning
- Modularization

Exploration work in 2017

- New C++ interfaces
- New analysis approaches: functional chains, Spark clusters
- Web-based graphics (JS) to replace ROOT graphics and GUI

CernVM Plans

Presentation to experiments on January 16

[CernVM plans for 2017](#)



Main effort goes to support running services

Developments driven by

- Forthcoming needs
 - Run3, AFS replacement, ...
- Improved flexibility for deployment
 - diverse cache backends, ...
- Exploitation of product's potential:
 - Docker integration, VM cluster handling, ...