# Architects Forum Meeting

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| **Date / Time:** | 07 May 2020, 14:00 |
| **Agenda:** | https://indico.cern.ch/event/915333/ |
| **Present:** | |
| **Remote:** | P Buncic (EP-SFT, chair, minutes), Axel, Jakob, Maria Girone, Marco Clemencic, Giulio Eulisse, Graeme Stewart, Danilo Piparo, Pere Mato, Andre Sailer, Gabriele Cosmo, Andrea Valassi, Edward Moyse, Alberto Di Meglio, Walter Lampl |
| **Excused:** | G Ganis |
| **Next meeting:** | 04 June 2020 |

| Announcements and upcoming events |
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| Draft minutes of the last meeting can be found [here.](#)<br>Minutes of the previous meetings can be found [here.](#) |

| 11-13 May 2020;<br><br>21-25 September 2020 | HSF/WLCG Workshop @ Lund - meeting has been provisionally rescheduled for 21-25 September 2020, but this will be confirmed later (dependent on COVID-19 situation). If there's no physical meeting we will probably organise another virtual event.<br><br>Short _virtual Lund_ meeting, 11-13 May on **New Architectures, Portability, and Sustainability** next week. 2 hours per day, 16-18h to be TZ and concentration span friendly. Agenda and speakers now defined, please register. |
| 14-16 July 2020 | Xrootd Workshop in Ljubljana |
| 1-3 February 2021 | CernVM workshop |

| SFT Line Management |
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| Personnel movement<br>   - Summer Student program was cancelled due to COVID-19<br>   - New Doctoral Student started in May (Bernhard Gruber) to work within the ROOT project on automatic memory layout optimisations on various hardware architectures and portability libraries<br>GSOC<br>   - 36 slots agreed by Google.<br>   - CernVM-FS GSoC student Mohit Tyagi started in May. He is co-supervised by the CVMFS team and by the podman main developer at Red Hat. The project aims at developing a cvmfs plugin for the podman container runtime to distribute container images from /cvmfs to podman. |

Covid-19
- The group will continue mainly in 'tele-working' mode with very few exceptions and limited presence at CERN for the next weeks.

| **Report from the SFT Projects** | |
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| ROOT | <ul><li>Preparing 6.22 release candidate, 6.20/06</li><li>ROOT Experiments Meeting on May 13</li></ul> |
| Simulation | <ul><li>The new development release of Geant4, including the developments of the last month was deployed last week and is installed on CVMFS at CERN.</li><li>The Geant4 Collaboration workshop, scheduled for September 21-25th, originally hosted at the IRISA laboratory in Rennes (France) will be likely converted to a video conference, due to the COVID emergency.</li><li>The paper on GeantV has been uploaded on arXiv: http://arxiv.org/abs/2005.00949 Planning to publish it in the Computing and Software for Big Science journal.</li></ul> |
| CernVM | <ul><li>CernVM-FS 2.7.2 was released. The release contains bugfixes and improvements for clients and servers, most notably a considerable speed-up for interactive browsing of /cvmfs/unpacked.cern.ch</li><li>A pre-GDB on software deployment was held: https://indico.cern.ch/event/813800/ GDB summary: https://indico.cern.ch/event/813747/ With respect to application containers created by experiments, there is overlap with the subjects discussed in the AF</li><li>Ongoing work on deploying a new cvmfs monitoring web site, expected to be live by next month</li></ul> |

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| | - Ongoing work on making sw.hsf.org and sw-nightlies.hsf.org available on the grid<br>- All small cvmfs repositories hosted at CERN now use S3 as a storage backend, the migration of the large LHC repositories has started and is expected to be finished within the next few months |
| SPI | - Consolidation and completion of LCG_97 on-going<br>   - Fixes in the Python3 builds<br>   - SLC6 build requested by SuperCDMS (SnowLab)<br>      - Possibly used by ATLAS<br>   - Clang10 builds available<br>   - Ubuntu builds w/ Hadoop requested by IT<br>- Patch release LCG_97a under consideration to fix some issues requiring package version upgrades (e.g. TChain name truncation in ROOT; Openblas numerical incorrectness with gcc 9)<br>- Provided page dedicated to Python3 migration<br>   - Most differences in package content due to not-anymore-supported packages and to packages used to backport Python3 functionality<br>- Nightly dev4Gaudi to test Gaudi Cmake modernisation from development branch (under evaluation for key4hep)<br>- Discussion on HEP_OSLibs scheduled for LIM on May 12th |

| Related Projects & IT |
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| Xrootd | - 4.12.0 - will be released this week, contains new important fixes and enhancements for Alice (better error recovery with metalinks, inferred checksum type, bandwidth |

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| | limiting) and OSG (XrdHttp), in addition vomsxrd has been adopted as a subpackage of xrootd (xrootd-voms)<br>● R5 - we will cut RC3 as a serious bugs was discovered in RC2 (TLC vs GSI) |
| HSF | ● Virtual workshop next week (11-13 May) - see above<br>● Next workshop slot 21-25 September, not clear how that will proceed yet (see above) could (likely?) be virtual<br>● LHCC Input on Common Tools and Community Software finished: https://zenodo.org/record/3779250 (DOI: 10.5281/zenodo.3779250).<br>● Meeting yesterday that discussed multi-threading strategy amongst experiments and projects; deprecation of tbb::task seems to be manageable, staying in TBB-iverse; HPX interesting as R&D. |
| CERN openlab | ● We are finalizing with Intel the OneAPI project agreement. Waiting for Intel internal discussions on the level of support.<br>● Discussing with Google about a workshop on TPUs, details to be discussed next week<br>● Alternative plans for the Summer Students programme being discussed. A CERN-wide educational set of events (lectures, hands-ons, etc.) is being defined across all programmes. Supervisors are invited, if possible, to turn their projects into remote coaching. Instructions are being circulated. |
| IT-SC-RD | ● The paper from the HSF generator WG has been completed and uploaded to https://arxiv.org/abs/2004.13687. It will soon be submitted to Springer CSBS. |

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| | <ul><li>Ongoing work on MadGraph port to GPUs. Still focusing on CUDA, eventually plan to look also at Alpaka and oneAPI.</li><li>Preparing the discussion of accounting and benchmarking at the virtual Lund workshop next week, in collaboration with the HEPIX benchmarking WG and openlab.</li><li>Discussion about HepOSlibs at the PreGDB May 5th and the LIM meeting May 12th.</li></ul> |
| EP R&D | <ul><li>Fellow in place for Reconstruction Tracking, Moritz Kiehn. Candidates for simulation and analysis identified in 2020-1 round.</li></ul> |

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| **Stakeholders feedback** | |
| ALICE | <ul><li>Happy to report that all of our current ROOT patches on top of 6.20 have been accepted upstream.</li><li>Several external package versions bumped in our stack, including G4, ROOT, Arrow, Fluka.</li><li>Initial support for Centos8.</li><li>Integration tests of the whole data acquisition and reconstruction chains undergoing. Improvements for GPU support in FairMQ integrated in O2.</li><li>Migrating the CVMFS ReleaseManager to Centos7 + S3 backend. So far so good.</li></ul> |
| ATLAS | <ul><li>Started validating the offline release for run 3 data processing</li><li>Main development branch moved to LCG97 (not completely painless this time)</li></ul> |

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| CMS | <ul><li>Released CMSSW_11_1_0_pre7 with G4 10.6: this will be the new version of G4 in CMS stack</li><li>IBs with ROOT master (what will become 6.22) look ok. Will try to incorporate 6.22 in CMSSW_11_2_0</li></ul> |
| LHCB | <ul><li>LHCb has just ratified the decision to use the GPU based implementation of the HLT1 trigger</li><li>We are planning to have a 1 day workshop (open to other experiments, SFT etc.) to plan for the future of heterogeneous computing in LHCb</li></ul> |
| CLIC | <ul><li>Created iLCSoft build based on LCG_97, using a self-made "view" at the moment<ul><li>Issue with geant4 data files (fixed https://sft.its.cern.ch/jira/browse/SPI-1579 )</li><li>We need to figure out what we want/not want (dd4hep, podio, gaudi) before discussing "official" view</li></ul></li><li>After discussion with Marco Clemencic, key4hep will use gaudi cmake-modernisation branch<ul><li>Included in dev4_gaudi lcg build (as far as I remember)</li></ul></li></ul> |
| FCC | <ul><li>Could not yet build against LCG_97 because of residual issues with Gaudi v33 now fixed in dev4 (inclusion of v33r1 + patches); this will be included in a dedicated LCG_97 layer</li><li>Main ongoing activities related to the validation of MC generators in e+e- context to identify missing pieces. For example, still issues with Whizard for advanced settings (e.g. requiring NLO) followed up with authors.</li></ul> |

**Discussion summary**

There were no comments on the minutes from the meeting on 02/04/2020, which are now approved.

The SFT projects presented a short status report summarized in the respective sections of this document. The group continues to work remotely, which seems to be quite effective, with projects announcing several software releases. The HSF announced that the document for the LHCC review had been finalized on time. Jakob reported on a pre-GDB meeting on Software deployment where consensus has been reached on using containers for provisioning the OS environment for jobs running on the grid. During one of the upcoming AF meetings, we agreed to discuss the impact of that decision on CernVM/CVMFS developments and plans.

The experiments are proceeding with their software developments for Run3 with no critical problems or new requests to the SFT projects. ALICE thanked the ROOT team for a quick response and accepting the patches that resolved their recent issues. LHCb announced its decision to base their Run 3 online reconstruction on the HLT1 trigger farm on the GPU platform. Pere wondered if this is going to create many CUDA related requests from the LHCb. That will be better understood after the planned workshop (open to other experiments, SFT aetc.)

Danilo presented status and plans for evolution of CMS software framework for Run 3 and beyond. See slides on the agenda for details.

Predrag asked all experiments to look back to Gulio's summary of ALICE plans in the first talk of this series and try to provide a similar synthesis of their software architecture and indicate the changes that might impact the work and development plans of the projects in the SFT group.

The next AF meeting will be on June 4th.

| Action items |
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