

News from the ROOT Team

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ROOT

Data Analysis Framework

<https://root.cern>



- ▶ Once called “Planning Meeting”
- ▶ Now called “Experiments and ROOT Meeting”
 - Our opportunity to inform you about developments, bugs, release schedule, highlights from the ROOT meetings (Team, IO, PPP, TMVA)
 - Your opportunity to give input about priorities, signal issues early, express needs and wishes

Thanks for your contribution to the ROOT project.



- ▶ 6.16 due in November: will branch ideally at the end of this week
 - 2-3 weeks for doc, Coverity, release notes,
- ▶ We are working on the blockers (ROOT-9757, ROOT-9743, ROOT-9666, ROOT-9637, ROOT-9660, ROOT-9709, ROOT-9725, ROOT-9719, ROOT-9686, ROOT-9668)
- ▶ Focus on GCC8: removal of warnings
- ▶ 6.14 Patch release this week



Highlights of ROOT 6.16



- ▶ Revert default compression algorithm to ZLIB
 - LZ4 is good, but a corner case: will be the default once this is clarified
 - Cloudflare ZLIB likely, centralised switch for algorithm+level
- ▶ Optimised read of streamer infos
 - Removed costly work in case SI block identical to one previously read (i.e. when processing a *TChain*)
- ▶ TTreeReader can now *vector<bool>*



RooFit Highlights

- ▶ Major upgrades of RooFit documentation
- ▶ Improved memory frees at tear-down

We welcome Stephan Hageboeck!



PyROOT Highlights

- ▶ New, Cppyy based PyROOT available (`-Dpyroot_experimental=ON`)
- ▶ Some issues with ownership still
- ▶ Support for C++ lambdas, move semantics
- ▶ Substantial set of Pythonisations: Tree, File, Branch
 - Classes pythonised lazily upon usage (less memory!)



Graphics Highlights

- ▶ Expose preview of js graphics backend in ROOT6: TWebCanvas
 - Many different plots already work (see graphics/graph/hist)
 - Build with c++14 enabled
 - Example: `root.exe --web tutorials/hist/ratioplot4.C`
 - From code: `gROOT->SetWebDisplay("");`
 - Works on Win, Linux, Mac: it's a browser :)
- ▶ Goal: collect feedback about the future ROOT graphics system
- ▶ Possible: zoom, show tooltips, execute context menu commands, modify TGraph points, interactive callbacks on the server side
- ▶ Limitation: not every detail changed in the browser will be reflected in memory



Modules Highlight

- ▶ Goal: use clang modules (persistified AST) to store reflection information
- ▶ Preview of the functionality: ROOT and its tests work
 - *-Druntime_cxxmodules=ON*
- ▶ Memory and runtime at the level of the PCH based “traditional” build
 - Better for long running tests, startup time needs more optimisations
- ▶ Can mix modules and “traditional” dictionaries + rootpcms + rootmaps
 - Ideal for defining a migration strategy!



- ▶ Deep Learning:
 - CNN (CPU and Cuda implementations)
- ▶ New optimisers: E.g. Adam
- ▶ Cross validation: multiprocess implementation
- ▶ Performance improvements
 - Multithreaded DNN and BDT
 - Cuda DNN faster than Tensor Flow



More Highlights



- ▶ Two Parallelism, Performance and Programming Model meetings dedicated to the “Forest Prototype”
 - <https://indico.cern.ch/event/766547>
- ▶ Outcome: live document containing our knowledge about RForest
 - Contains link to a PR with the skeleton of the relevant classes