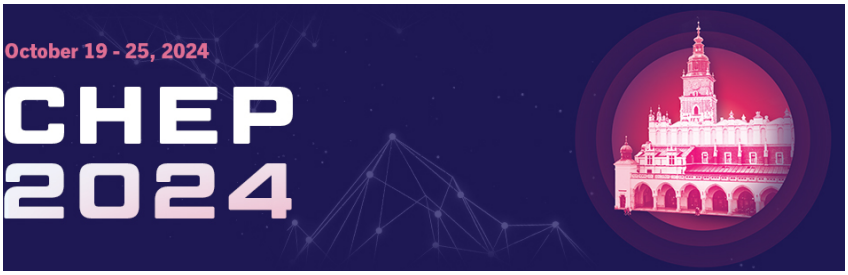


Contribution ID: **105** Type: **Talk**

# Thoroughly testing and integrating hundreds of Pull Requests per month: ROOT's new Cost-efficient and Feature Rich GitHub-based CI

*Monday 21 October 2024 14:42 (18 minutes)*

ROOT is an open source framework, freely available on GitHub, at the heart of data acquisition, processing and analysis of HE(N)P experiments, and beyond.

It is developed collaboratively: contributions are not authored only by ROOT team members, but also by a veritable nebula of developers and scientists from universities, labs as well as the private sector. More than 1500 GitHub Pull Requests are merged on average per year. It is in this context that code integration acquires a primary role: not only code contributions need to be reviewed, but they need to be thoroughly tested through a powerful CI infrastructure on several different platforms to comply with the high code quality standards of the project. Since the end of 2023, ROOT moved its continuous integration system from a Jenkins one to a GitHub Actions based one.

In this contribution, we characterise the transition to the GitHub CI, focussing our strategy, its implementation and the lesson learned, as well as the advantages the new system offers with respect to the previous one. Particular emphasis will be given to the evaluation of the cost-benefit ratio for Jenkins and GitHub Actions for the ROOT project. We'll also describe how we manage to run in less than one hour thousands of unit, integration, functional and end-to-end tests on different flavours of Windows, four versions of macOS, as well as about ten of the most used Linux distributions, taking advantage of the CERN computing infrastructure.

**Primary author:** PIPARO, Danilo (CERN)

**Co-authors:** NAUMANN, Axel (CERN); HAHNFELD, Jonas (CERN & Goethe University Frankfurt); MUZAFFAR, Malik Shahzad (CERN); MORUD, Ole (Norwegian University of Science and and Technology (NTNU) (NO)); CANAL, Philippe (Fermi National Accelerator Lab. (US)); HAGEBOECK, Stephan (CERN); VASILEV, Vassil (Princeton University (US))

**Presenter:** PIPARO, Danilo (CERN)

**Session Classification:** Parallel (Track 6)

**Track Classification:** Track 6 - Collaborative software and maintainability