

Performance in offline event reconstruction landscape at CMS

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CMS offline event reconstruction algorithms cover simulated and acquired data processing starting from the detector raw data on input and providing high level reconstructed objects suitable for analysis. The landscape of supported data types and detector configuration scenarios has been expanding and covers the past and expected future configurations including proton-proton collisions and collisions with heavy ions through the high luminosity LHC era. All of this landscape is handled in the same software release development cycle. Every year the landscape is dominated by the current year proton-proton collision data taking in terms of computational and output data volume. By 2018 the landscape is relatively well established and application performance for Run-2 and Run-3 of LHC can be understood. We provide in-depth look at the performance of a typical production application running offline event reconstruction, focusing on specific areas of subdetector or higher level object reconstruction. We highlight the recent trends in developments and their impact on resource use required to run the application. An outlook for future challenges of running in HL-LHC era is provided based on the latest state of the art event reconstruction application setup.

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