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PROOF - The Parallel ROOT Facility

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The Parallel ROOT Facility, PROOF, enables the interactive analysis of distributed data sets in a transparent way. It exploits the inherent parallelism in data of uncorrelated events via a multi-tier architecture that optimizes I/O and CPU utilization in heterogeneous clusters with distributed storage. Being part of the ROOT framework PROOF inherits the benefits of a performant object-oriented storage system and a wealth of statistical and visualization tools. Dedicated PROOF-enabled testbeds are now being deployed at CERN for testing by the LHC experiments. This paper describes the status of PROOF, focusing mainly on the latest developments: enriched API providing transparent browsing and drawing of data structures stored remotely, and full handling of the results of queries, with retrieve and archive functionalities; support for asynchronous (non-blocking) running mode, giving the possibility to submit a set of queries to be processed sequentially in the background; support for disconnect/reconnect-from-any-other-place functionality, allowing the user to temporary leave a session with running queries and reconnect later on to monitor the status and eventually retrieve the results; improved user interface with a powerful GUI allowing full control on the system and handling of the results; support for dynamic cluster configuration using self-discovery techniques to find out the available nodes; optimized response of the system in multi-user environments, like those foreseen in the forthcoming HEP experiments, with an abstract interface to the most common accounting systems. The ongoing developments to increase the robustness and fault tolerance of the system will also be discussed.

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