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PROOF-based analysis on the ATLAS Grid facilities: first experience with the PoD/PanDa plugin

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In the ATLAS computing model Grid resources are managed by the PanDA system, a data-driven workload management system designed for production and distributed analysis. Data are stored under various formats in ROOT files and end-user physicists have the choice to use either the ATHENA framework or directly ROOT. The ROOT way to analyze data provide users the possibility to use PROOF to exploit the computing power of multi-core machines or to dynamically manage analysis facilities. Since analysis facilities are, in general, not dedicated to PROOF only, PROOF-on-Demand (PoD) is used to enable PROOF on top of an existing resource management system.

In a previous work we investigated the usage of PoD to enable PROOF-based analysis on Tier-2 facilities using the PoD/gLite plug-in interface. Our study focused in particular on the startup time and on the aggregate read-out rate, showing promising results for both cases.

In this paper we present the status of our investigations using the recently developed PoD/PanDA plug-in to enable PROOF, and a real end-user ATLAS physics analysis as payload. For this work, data were accessed using two different protocols: XRootD and file protocol, the former in the site where the SRM interface is Disk Pool Manager (DPM) and the latter where the SRM interface is StoRM with GPFS file system. Using PanDA also gives the possibility to test more realistic scenarios, where users belong to different groups and roles and are in real competition for the resources.

We will first describe the configuration and setup details and the results of some benchmark tests we run on the Italian Tier-2 sites and at CERN. Then, we will compare the results of different types of analysis, comparing performances accessing data in relation to different types of SRM interfaces and accessing data with XRootD in the LAN and in the WAN using the ATLAS storage federation infrastructure.

Finally we will discuss the behavior of the system in the presence of concurrent users.

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