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Benchmarking OSDF services to develop XrootD best practices

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Research has become dependent on processing power and storage, with one crucial aspect being data sharing. The Open Science Data Federation (OSDF) project aims to create a scientific global data distribution network, expanding on the StashCache project to add new data origins and caches, access methods, monitoring, and accounting mechanisms. OSDF does not develop any new software, relying on the XrootD and Pelican projects, instead. Nevertheless, it is vital for OSDF to understand the XrootD limits under various configuration options, including transfer rate limits, proper buffer configuration and storage type effect. We have thus executed a set of benchmarks with the goal of creating a set of recommendations to share with the XrootD and Pelican teams. In this work we describe the tests and the results performed using hosts on the National Research Platform (NRP). The tests cover a wide range of file sizes and parallel streams, and use clients located at various distances from the server host. We also used several standalone clients (wget, curl, pelican) and the native HTCondor file transfer mechanisms.

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