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ALICE DAQ Online Transient Data Storage

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ALICE is a dedicated heavy-ion detector to exploit the physics potential of nucleus-nucleus (lead-lead) interactions at LHC energies. The aim is to study the physics of strongly interacting matter at extreme energy densities, where the formation of a new phase of matter, the quark-gluon plasma, is expected.

Running in heavy-ion mode the data rate from event building to permanent storage is expected to be around 1.25 GB/s. To continue data recording even in the event of hardware failure or connection problems, a large disk pool has been installed at the experiment's site as buffering layer between the DAQ and the remote (~5km) tape facility in the CERN Computing Centre. This Transient Data Storage (TDS) disk pool has to provide the bandwidth to be able to simultaneously absorb data from the event building machines and to move data to the tape facility. The aggregated bandwidth of the TDS is expected to exceed 3 GB/s in mixed I/O traffic.

Extensive tests have been carried out on various hardware and software solutions with the goal to build a common file space shared by ~60 clients, whilst still providing maximum bandwidth per client (~400MB/s, 4Gbps Fibre Channel), fail-over safety and redundancy.

This talk will present the chosen hardware and software solution, the configuration of the TDS pool and the various modes of operation in the ALICE DAQ framework. It will also present the results of the performance tests carried out during the last ALICE Data Challenge.

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