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Experiences and challenges running CERN's high-capacity tape archive

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CERN's tape-based archive system has collected over 70 Petabytes of data during the first run of the LHC. The Long Shutdown is being used for migrating the complete 100 Petabytes data archive to higher-density tape media. During LHC Run 2, the archive will have to cope with yearly growth rates of up to 40-50 Petabytes. In this contribution, we will describe the scalable architecture for coping with the storage and long-term archival of such massive data amounts, as well as the procedures and tools developed for the proactive and efficient operation of the tape infrastructure. This will include also the features developed for automated problem detection, identification and notification. We will also review the challenges resulting and mechanisms devised for measuring and enhancing availability and reliability, as well as ensuring the long-term integrity and bit-level preservation of the complete data repository. Finally, we will present an outlook in terms of the future performance and capacity requirements growth and how they match the expected tape technology evolution.

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