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BM@N Run 8 data reconstruction on a distributed infrastructure with DIRAC

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The BM@N 8th physics run using Xenon ion beams was successfully completed in February 2023, resulting in the recording of approximately 550 million events. They were recorded in the form of 31306 files, with a combined size exceeding 430TB. However, the reconstruction of these files demands significant computing resources, which is why a distributed infrastructure unified by DIRAC was chosen for this task. The first objective was to transfer the raw files from EOS in LHEP to DIRAC storage, based on EOS in LIT. This was achieved through parallel transfer using multiple independent DIRAC jobs. Once the data was accessible by all the resources integrated in DIRAC, the profiling of digitization and reconstruction jobs were performed to determine the computing resource requirements. For the digitization step three computing resources were selected: Tier1 and LHEP for 99% of the files, and Govorun for large files ranging from 16 to 250 gigabytes. Finally, Tier1, Tier2, and LHEP clusters were utilized to reconstruct the files obtained after digitization. The BM@N 8th physics run in February 2023 was the first time DIRAC had been used for raw data reconstruction in JINR in production rather than just in test mode. As a result, a set of approaches, systems, and methods were developed during this campaign, which will aid in reducing the efforts required for future data reconstructions at JINR.

Summary

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