

The ATLAS computing challenge for HL-LHC

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The ATLAS experiment successfully commissioned a software and computing infrastructure to support the physics program during LHC Run 2. The next phases of the accelerator upgrade will present new challenges in the offline area. In particular, at High Luminosity LHC (also known as Run 4) the data taking conditions will be very demanding in terms of computing resources: between 5 and 10 KHz of event rate from the HLT to be reconstructed (and possibly further reprocessed) with an average pile-up of up to 200 events per collision and an equivalent number of simulated samples to be produced. The same parameters for the current run are lower by up to an order of magnitude.

While processing and storage resources would need to scale accordingly, the funding situation allows one at best to consider a flat budget over the next few years for offline computing needs. In this paper we present a study quantifying the challenge in terms of computing resources for HL-LHC and present ideas about the possible evolution of the ATLAS computing model, the distributed computing tools, and the offline software to cope with such a challenge.

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