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## The 200 Gbps Challenge: Imagining HL-LHC analysis facilities

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The IRIS-HEP software institute, as a contributor to the broader HEP Python ecosystem, is developing scalable analysis infrastructure and software tools to address the upcoming HL-LHC computing challenges with new approaches and paradigms, driven by our vision of what HL-LHC analysis will require. The institute uses a “Grand Challenge” format, constructing a series of increasingly large, complex, and realistic exercises to show the vision of HL-LHC analysis. Recently, the focus has been demonstrating the IRIS-HEP analysis infrastructure at scale and evaluating technology readiness for production.

As a part of the Analysis Grand Challenge activities, the institute executed a “200 Gbps Challenge”, aiming to show sustained data rates into the event processing of multiple analysis pipelines. The challenge integrated teams internal and external to the institute, including operations and facilities, analysis software tools, innovative data delivery and management services, and scalable analysis infrastructure. The challenge showcases the prototypes —including software, services, and facilities— built to process around 200 TB of data in both the CMS NanoAOD and ATLAS PHYSLITE data formats with test pipelines.

The teams were able to sustain the 200 Gbps target across multiple pipelines. The pipelines focusing on event rate were able to process at over 30MHz. These target rates are demanding; the activity revealed considerations for future testing at this scale and changes necessary for physicists to work at this scale in the future. The 200 Gbps challenge has established a baseline on today’s facilities, setting the stage for the next exercise at twice the scale.

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