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Information Technologies for the HL-LHC in 2030 and Beyond

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The computing, storage and communications challenges of the HL LHC era will extensively use emerging technologies which are currently in various stages of conception and pre-specification, so they are not yet on the computing and more broadly, the experimental roadmap. I will briefly introduce the physics and technology barriers in terms of computational and storage nanoscale feature sizes, the energy required for signaling much beyond 1 Tbps, the application pulls from the Internet of Things to exascale computing to the developing 6G wireless standard expected to emerge circa 2030 with 1 Tbps links. I will point to current authoritative information sources such as the IEEE International Roadmap for Devices and Systems (IRDS) discussing the challenges and visionary approaches being taken to meet the challenges make the transition to the Beyond CMOS era of 2030-2040.

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