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UltraLight is a collaboration of experimental physicists and network engineers whose purpose is to provide the network advances required to enable and facilitate petabyte-scale analysis of globally distributed data. Existing Grid-based infrastructures provide massive computing and storage resources, but are currently limited by their treatment of the network as an external, passive, and largely unmanaged resource. This paper will give an overview of the recent advances made within the UltraLight collaboration over the last 3 years within the different work areas of the project which include: the UltraLight testbed, transportation layer (FAST TCP and MAX net), transfer applications (FDT), network aware command and control systems (VINCI), network centric storage clouds (LStore), and physics applications (data streaming and distributed analysis). Several of the technologies developed within the UltraLight project are currently being deployed and field tested to support efficient transfer of data and prepare for LHC startup. The core of the tools rely on globally distributed publish and subscribe infrastructures and end-to-end monitoring, to prevent single points of failure, increase robustness and improve scalability.

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