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Lambda Station: Production Applications Exploiting Advanced Networks in Data Intensive High Energy Physics.

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High Energy Physics collaborations consist of hundreds to thousands of physicists and are world-wide in scope. Experiments and applications now running, or starting soon, need the data movement capabilities now available only on advanced and/or experimental networks. The Lambda Station project steers selectable traffic through site infrastructure and onto these "high-impact" wide-area networks. Lambda Station also controls ingress and egress filters between the site and the high-impact network and takes responsibility for negotiating with reservation or provisioning systems that regulate the WAN control plane, be it based on SONET channels, demand tunnels, or dynamic optical links. This article will discuss design principles, the current status of the project, the results achieved up to date, and challenges surmounted building Lambda Station aware applications via DOE's UltraScience Net and ESnet networks and ULtraLight between Fermilab, Caltech, and other sites.

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