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A Lossless Switch for Data Acquisition Networks ^[1]

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The recent trends in software-defined networking (SDN) and network function virtualization (NFV) are boosting the advance of software-based packet processing and forwarding on commodity servers. Although performance has traditionally been the challenge of this approach, this situation changes with modern server platforms. High performance load balancers, proxies, virtual switches and other network functions can be now implemented in software and not limited to specialized commercial hardware, thus reducing cost and increasing the flexibility. In this paper we design a lossless software-based switch for high bandwidth data acquisition (DAQ) networks, using the ATLAS experiment at CERN as a case study. We prove that it can effectively solve the incast pathology arising from the many-to-one communication pattern present in DAQ networks by providing extremely high buffering capabilities. We evaluate this on a commodity server equipped with twelve 10 Gbps Ethernet interfaces providing a total bandwidth of 120 Gbps.

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[For more information](#) ^[2]

Technical document file:

 [ATL-DAQ-PROC-2015-025.pdf](#) ^[3]

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