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Evolution of the ATLAS PanDA Workload Management System for Exascale Computational Science

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An important foundation underlying the impressive success of data processing and analysis in the ATLAS experiment at the LHC is the Production and Distributed Analysis (PanDA) workload management system. PanDA was designed specifically for ATLAS and proved to be highly successful in meeting all the distributed computing needs of the experiment. However, the core design of PanDA is not experiment specific. The PanDA workload management system is capable of meeting the needs of other data intensive scientific applications. Alpha-Magnetic Spectrometer, an astro-particle experiment on the International Space Station, and the Compact Muon Solenoid, an LHC experiment, have successfully evaluated PanDA and are pursuing its adoption. In this talk, a description of the new program of work to develop a generic version of PanDA will be given, as well as the progress in extending PanDA's capabilities to support supercomputers and clouds and to leverage intelligent networking. PanDA has demonstrated at a very large scale the value of automated dynamic brokering of diverse workloads across distributed computing resources. The next generation of PanDA will allow other data-intensive sciences and a wider exascale community employing a variety of computing platforms to benefit from ATLAS' experience and proven tools.

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